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# Clinical Nutrition

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Nutrition and nutritional care have gained wide clinical and scientific interest during the past decades. The increasing knowledge of metabolic disturbances and nutritional assessment in chronic and acute diseases has stimulated rapid advances in design, development and clinical application of nutritional support. The aims of ESPEN are to encourage the rapid diffusion of knowledge and its application in the field of clinical nutrition and metabolism.

Being the journal of ESPEN with members from various interests, either focused on basic research or clinical disciplines, the journal reflects the scientific nature of this multidisciplinary background and encourages the coordination of investigation and research from these disciplines. The journal publishes high quality papers like guidelines, consensus statements, review papers, original articles, short communications, and letters to the Editor on those factors in acute and chronic diseases, which have metabolic and nutritional implications. It also publishes scientific works related to the development of new techniques and their application in the field of clinical nutrition.

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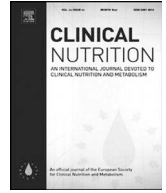
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## Orals

## Clinical Nutrition Symposium

## CN01

**WHEY PROTEIN ISOLATE SUPPLEMENTATION IMPROVES BODY COMPOSITION, MUSCLE STRENGTH AND TREATMENT TOLERANCE IN MALNOURISHED ADVANCED CANCER PATIENTS UNDERGOING CHEMOTHERAPY**

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**Rationale:** WP represents the soluble class of dairy proteins which are known immune-enhancing constituents linked to a range of bioactive functions, such as prebiotic effects, promotion of tissue repair, maintenance of intestinal integrity, destruction of pathogens and elimination of toxins. WPs are rich in substrates for glutathione synthesis and could play a major role in cell protection against free radicals, ionizing radiation, reactive oxygen species and carcinogens. Furthermore, supplementation with WP may also induce more muscle protein synthesis than other protein sources, due to their higher anabolic potential. We evaluated the benefit of whey protein isolate (WPI) supplementation in addition to nutritional counseling in malnourished advanced cancer patients undergoing chemotherapy (CT).

**Methods:** In a single-center, randomized, pragmatic, parallel-group controlled trial (ClinicalTrials.gov: NCT02065726; February 2014–June 2018), 166 malnourished advanced cancer patients with mixed tumor entities candidate to or undergoing CT, were randomly assigned to receive nutritional counseling with (N = 82) or without (N = 84) WPI supplementation (20 grams/daily) for 3 months. Primary endpoint was the change in phase angle (PhA). Secondary endpoints included changes in standardized PhA (SPA), fat-free mass index (FFMI), body weight, muscle strength, quality of life and CT toxicity (CTCAE 4.0 events).

**Results:** In patients with the primary endpoint assessed (modified intention-to-treat population), counseling plus WPI (N = 66) resulted in improved PhA compared to nutritional counseling alone (N = 69): mean difference, 0.48° [95%CI, 0.05 to 0.90] (P = 0.027). Imputation of missing outcomes yielded consistent findings. WPI supplementation resulted also in improved SPA (P = 0.021), FFMI (P = 0.041), body weight (P = 0.023), muscle strength (P < 0.001) and in a reduced risk of CT toxicity (risk difference, -9.8% [95%CI, -16.9 to -2.6]; P = 0.009), particularly of severe (grade ≥3) events (risk difference, -30.4% [95%CI, -44.4 to -16.5]; P = 0.001).

**Conclusions:** In malnourished advanced cancer patients undergoing CT and receiving nutritional counseling, a 3-month supplementation with WPI resulted in improved body composition, muscle strength, body weight and reduced CT toxicity. Further trials, aimed at verifying the efficacy of this nutritional intervention on mid and long-term primary clinical endpoints in newly diagnosed specific cancer types, are warranted.

**Disclosure of Interest:** None declared.

## CN02

**β-HYDROXY-β-METHYL-BUTYRATE (HMB), ARGININE AND GLUTAMINE COMPLEX ON MUSCLE VOLUME LOSS IN CRITICALLY ILL PATIENTS: A RANDOMIZED CONTROL TRIAL**

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**Rationale:** β-hydroxy-β-methylbutyrate (HMB), a metabolite of leucine, can strongly induce muscle protein synthesis. We evaluated the efficacy of HMB complex on muscle volume loss during critical care.

**Methods:** For this prospective, single-center, randomized control trial, we created control and HMB groups by random assignment of critically ill intensive care unit (ICU) patients for whom enteral nutrition could be performed. From day 2 after admission, HMB group participants were administered 3 g HMB, 14 g arginine, and 14 g glutamine daily in addition to standard nutrition therapy. Early rehabilitation with electrical muscle stimulation was started from day 2 in both groups. As a primary outcome, we evaluated femoral muscle volume using computed tomography on days 1 and 10 after ICU admission.

**Results:** From 164 ICU patients, 88 severely ill patients were included and assigned: 43 to control and 45 to HMB. Day 1 and day 10 femoral muscle volumes of 24 control and 26 HMB group participants were analyzed as per protocol. Volumes decreased significantly during days 1–10 (p < 0.0001). Volume loss rates were 14.4 ± 7.1% for control participants and 11.4 ± 8.1% for HMB participants (p = 0.18). In a subgroup of the sequential organ failure assessment scores <10, femoral muscle volume loss was 14.0 ± 6.9% for control participants and 8.7 ± 6.4% for HMB (p = 0.0474). Results of intention-to-treat analysis of the two groups showed no differences in basic characteristics or outcomes.

**Conclusions:** For critically ill patients, HMB complex supplementation from the acute phase of intensive care does not inhibit muscle volume loss. Only moderately severe patients received a benefit.

**Disclosure of Interest:** None declared.



**CN03****TICACOS INTERNATIONAL: A MULTI-CENTER, RANDOMIZED, PROSPECTIVE CONTROLLED STUDY COMPARING TIGHT CALORIE CONTROL VERSUS LIBERAL CALORIE ADMINISTRATION STUDY**

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**Rationale:** Following TICACOS pilot study (1), a multicenter prospective, randomized, controlled non blinded study assessed the advantage of guiding nutritional support in critically patients by daily measured resting energy expenditure (REE).

**Methods:** From 580 adult ventilated ICU patients planned to stay more than 48 hours, nutritional support was aimed to meet 100% of energy requirement measured by indirect calorimetry or by 25 kcal/kg IBW/d) in the Control Group. Parenteral Nutrition (PN) was added if enteral nutrition (EN) caloric supply <90% calculated needs. Enteral and parenteral formulas enriched in protein were used. Indirect calorimetry was performed using Deltatrac II, COVX (GE) or Quark (Cosmed, Italy). Statistics used T test for equality of means (independent samples test) and correlations with the Pearson correlation test. A p level <0.05 was considered as significant. Cross tabs procedure used Chi-square test for testing differences in complication rates, length of stay and length of ventilation. Kaplan Meir curves assessed the proportion of surviving patients in the 2 groups.

**Results:** Seven centers recruited 417 ITT patients from 4737 screened (339 per protocol). Study was stopped due to slow recruitment. No baseline differences between control and study groups in age, sex BMI, SOFA (7.1 ± 3.1 vs 7.4 ± 3.3) and APACHE II (22.4 ± 7.9 vs 22.2 ± 7.4). Measured REE was similar in the 2 groups. Study group received more total energy (1747 ± 467 vs 1305 ± 418 kcal/d, p < 0.02), more propofol (137 ± 37 vs 40 ± 28 kcal/d, p < 0.02) and protein (79 ± 20 vs 62 ± 7 g/d, p < 0.001) and was in a lower negative energy balance (-357 ± 1091 vs -875 ± 270 kcal/d, p < 0.001). When administered, calories from PN were larger in the study group (1477 vs 958 kcal/d, p < 0.02). Rate of infections (40 vs 31), including VAP, rate of pressure ulcers, surgery and dialysis requirement, length of ventilation, LOS ICU and hospital were similar. ICU Mortality (30 in the control vs 21 in the study group) was not different according to Kaplan Meir curve. None of these parameters reached significant difference. However, the decreased mortality observed in the study group added to the previous study may have a positive effect on a meta-analysis.

**Conclusions:** Tight Calorie Control guided by indirect calorimetry decreased rate of infection and mortality but not significantly in this study stopped prematurely. Compared to the pilot study, less overfeeding and more protein were associated with less complications. The trend in decrease mortality may reinforce the results of the meta-analysis exploring the effects of IC guided nutrition on mortality.

**Reference**

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**Disclosure of Interest:** None declared.

**CN04****EFFECTS OF A BLENDED HOME-BASED EXERCISE PROGRAM AND PROTEIN COUNSELLING IN COMMUNITY DWELLING OLDER ADULTS: RESULTS OF THE VITAMIN RCT**

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**Rationale:** With the ageing population, there is an increasing demand for strategies to optimise muscle mass, strength and physical performance in community dwelling older adults. We designed a new innovative e-health intervention “VITAMIN” to improve physical performance in older adults. The blended home-based exercise intervention contains digital support to improve personalised coaching as well as dietary protein counselling. This study evaluates the 6 months effectiveness of the intervention.

**Methods:** The cluster RCT included 245 community dwelling older adults (age ≥ 55 y) randomised to control, exercise, and exercise + dietary protein counselling group. Data was collected at baseline and after 6 months of intervention. The primary outcome was the modified Physical Performance test (mPPT) with an emphasis on daily functioning. Secondary measures were gait speed (GS; m/s), physical activity level (PAL), protein intake (g/kg/d), appendicular skeletal muscle mass by DXA (ASMM; kg), hand grip strength (HGS; kg). For statistical analysis SPSSv24.0 was used. A mixed models analysis was performed, with group, time and group\*time interaction as fixed factors, subject and cluster as random factors, and additional posthoc Bonferroni test.

**Results:** Mean age of the 224 evaluated participants was 72.0 ± 6.5 y, 71% were females and 44% low educated. No significant intervention effect was found for mPPT (p = 0.889). Secondary outcomes showed a significant intervention effect: GS (p = 0.002), PAL (p = 0.014), protein intake (p < 0.001), ASSM (p = 0.029), HGS (p < 0.001). Posthoc Bonferroni showed that exercise+protein group had statistical improved outcome compared to control for these secondary outcomes (p < 0.001; p = 0.003; p < 0.001; p = 0.009; p < 0.001). Control group showed declined values at 6 months compared to baseline for GS (Δ-0.23 m/s), PAL (Δ-0.03), ASSM (Δ-0.32 kg) and HGS (Δ-0.96 kg).

**Conclusions:** Older adults had already very high scores for physical performance (mPPT). However, the blended home-based exercise intervention with protein counselling was still effective for gait speed, physical activity level, dietary protein intake, muscle mass and strength. This personalised innovative e-health intervention showed to be a promising strategy for community dwelling older adults for maintenance instead of declining physical function.

**Disclosure of Interest:** None declared.

**CN05****PROSPECTIVE ASSOCIATIONS OF POOR DIET QUALITY WITH INCIDENT FRAILITY IN COMMUNITY-DWELLING OLDER ADULTS: THE HEALTH ABC STUDY**

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**Rationale:** Poor diet is considered an important determinant of the development of frailty. None of the studies on associations between dietary components and frailty considered time to onset of frailty nor potential competing risks. This study aimed to examine associations of diet quality indicators relevant in old age with 4-year incidence of frailty (accounting for competing risks of death) in community-dwelling older adults.

**Methods:** Data were from 2154 community-dwelling men and women aged 70–81 y in 1998–1999 (present study's baseline) from the Health ABC Study. In 1998–1999, dietary intake over the preceding year was assessed with a food frequency questionnaire. Indicators of diet quality include overall diet quality as estimated with the Healthy Eating Index (HEI; categorized as poor, medium, and good), energy intake, and protein intake (a priori adjusted for energy intake using the nutrient residual model). Frailty status was determined using Fried's five-component frailty phenotype and categorized into "robust" (0 components present), "pre-frail" (1–2), or "frail" (3–5). Cox proportional hazards analysis was used to examine associations of the diet quality indicators with 4-year incidence of 1) frailty and 2) pre-frailty or frailty. Competing risks analysis was used to examine associations with incidence of frailty by accounting for competing risks of death.

**Results:** During the 4-year follow-up, 277 of the 2154 participants, robust or pre-frail at baseline, developed frailty, and 629 of the 1020 participants, robust at baseline, developed pre-frailty or frailty. Among the robust and pre-frail, after adjustment for confounders including energy intake, those consuming poor- and medium-quality diets had a higher frailty incidence than those consuming good-quality diets (HR: 1.92, 95% CI: 1.17–3.17 and 1.40, 0.99–1.98, respectively). No associations for energy or protein intake were observed. Competing risks analysis yielded similar results. Among the robust, those with lower vegetable protein intake had a higher "pre-frailty or frailty" incidence (per –10 g/d: 1.20, 1.04–1.39). No other associations were observed.

**Conclusions:** Better overall diet quality and lower vegetable but not animal protein intake may increase the risk of becoming frail in old age. Although some prospective studies showed that higher total protein intake may lower frailty risk, our study indicates that the quality of the overall diet may be more important than protein intake for reducing the development of frailty in old age.

**Disclosure of Interest:** None declared.

#### CN06 IMPROVING REHABILITATION IN SARCOPENIA (IRIS) BY MUSCLE-TARGETED NUTRITIONAL SUPPORT: A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED TRIAL

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**Rationale:** Sarcopenia is a negative prognostic condition of aging. A combined intervention with physical exercise and nutritional support should be considered. We evaluated the efficacy of a muscle-targeted nutritional support on the outcome of a physical exercise rehabilitation program in old adults with sarcopenia.

**Methods:** A single-site, double-blind, randomized (1:1), placebo-controlled trial (NCT03120026) in sarcopenic old adults ( $\geq 65$  years) without severe cognitive impairment (Mini Mental State Examination  $\geq 18$ ) and admitted to an in-patient rehabilitation facility for a physical rehabilitation program. In addition to a standard hospital diet, patients ( $n = 140$ ) were randomized to receive until discharge (for at least 4 weeks and up to 8 weeks) a whey protein-based nutritional supplement enriched with leucine and vitamin D or an iso-caloric placebo twice daily. The primary efficacy endpoint was the change in 4-meter gait speed per month. Key secondary endpoints were change in physical performance outcome measures: chair-stand test, Timed up and go test, Short Physical Performance Battery. Other secondary outcome variables were change in: Tinetti scale, handgrip strength, Barthel Index, activities of daily living (ADL), body weight, appendicular muscle mass (AMM), skeletal muscle mass index (SMMI), cognitive status (Trail making test, MMSE) and quality of life (12-item Short-Form health Survey). The overall economic benefits (surrogate measures: length of stay and duration of rehabilitation) were also evaluated.

**Results:** Intention-to-treat analyses were based on patients reassessed at discharge ( $n = 127$ ). Supplementation with the experimental formula ( $n = 64$ ) resulted in greater increase in gait speed than placebo ( $n = 63$ ): mean difference, 0.063 meters/sec/month [95%CI, 0.043 to 0.082] ( $P < 0.001$ ). A significant effect was also found for all physical performance, functional and cognitive function endpoints ( $P < 0.001$  for all), AMM ( $P = 0.011$ ) and SMMI ( $P = 0.023$ ). No difference was observed in quality of life. Supplementation resulted also in higher proportion of patients improving their rehabilitation intensity profile ( $P = 0.003$ ) and being discharged at home ( $P = 0.002$ ) and in shorter rehabilitation ( $P < 0.001$ ) and hospital stay ( $p < 0.001$ ).

**Conclusions:** In old adults with sarcopenia admitted to hospital for rehabilitation the consumption of a whey protein-based nutritional formula enriched with leucine and vitamin D improved physical performance and function, muscle mass and reduced the intensity and costs of care.

**Disclosure of Interest:** None declared.

#### GLIM

##### GM01 COMPARISON OF ESPEN 2015 AND GLIM CRITERIA FOR ASSESSING MALNUTRITION IN SYSTEMIC SCLEROSIS

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**Rationale:** Systemic sclerosis (SSc) is a rare, chronic autoimmune disease characterized by fibrosis of the skin and internal organs. Gastrointestinal involvement may lead to malnutrition which can in turn negatively affect morbidity, mortality and quality of life. The aim of the study was to assess the prevalence of malnutrition in SSc patients with both the ESPEN 2015 and the recently published GLIM criteria and to assess whether it relates with disease activity and severity.

**Methods:** Adults patients with diagnosis of SSc admitted to our Scleroderma Unit were included in the study. Biochemical analyses, disease activity index (DAI), disease severity scale (DSS), anthropometric data and body composition from bioelectrical impedance (BIA) were recorded at the time of enrollment. Group comparisons were made by Student's unpaired two-tailed t-test or Kruskal–Wallis test. Pearson or Spearman correlation coefficients ( $r$ ) were used as appropriate.

**Results:** One hundred and two SSc patients were enrolled (86 females; mean age  $55 \pm 14$  years). Fifty-seven patients had limited cutaneous

SSc and forty-five had diffuse cutaneous SSc. The prevalence of malnutrition was 8.8% (9/102) according to ESPEN 2015 criteria and 16.6% (17/102) according to GLIM criteria. GLIM severity grading of malnutrition was moderate in 13 patients (12.7%), severe in 4 patients (3.9%). In SSc patients with malnutrition according to GLIM criteria, DAI and DSS were significantly higher than in SSc patients without malnutrition ( $p < 0.0001$ ), while no association was observed between malnutrition and DAI or DSS when using the ESPEN 2015 criteria.

**Conclusions:** In our study the prevalence of malnutrition is higher using GLIM criteria with respect to ESPEN 2015 criteria. In SSc, GLIM criteria appear to better discriminate for the presence of malnutrition associated with higher degree of disease severity and activity.

**Disclosure of Interest:** None declared.

## GM02

### VALIDATION OF GLIM MALNUTRITION CRITERIA FOR DIAGNOSIS OF MALNUTRITION IN ICU PATIENTS

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**Rationale:** Patients in ICU are at high risk of malnutrition. Global Leadership Initiative on Malnutrition (GLIM) is a new malnutrition-screening tool.<sup>1</sup> The present study compares the nutrition-related parameters of the following tools: GLIM tool, Patient- And Nutrition-Derived Outcome Risk Assessment (PANDORA) score, and low FFMI (Fat Free Mass Index) to the gold standard SGA (Subjective Global Assessment) regarding their values on predicting malnutrition in severely ill patients.

**Methods:** 84 ICU patients included. The tools mentioned above were assessed for diagnosis of malnutrition. All patients were defined as suffering from acute disease and received medical nutrition therapy. Statistical analysis was based on Stepwise regression to demonstrate correlation between proposed parameters. In addition, T-Test and Pearson correlation was used between variances.

**Results:** Mean age was  $50 \pm 20$  years, BMI  $25.3 \pm 5.1$  kg/m<sup>2</sup>, APACHE II  $20.5 \pm 7.7$ , PANDORA score  $32 \pm 8.5$ . GLIM malnutrition criteria was significantly correlated with low FFMI, with PA (Phase Angle) and with PANDORA score ( $R = 0.778$ ,  $p \leq 0.00$ ;  $R = -0.307$ ,  $p \leq 0.005$ ;  $R = 0.215$ ,  $p \leq 0.05$  respectively). SGA assessment was correlated with GLIM malnutrition criteria and PANDORA score ( $R = 0.518$ ,  $p \leq 0.00$ ;  $R = 0.517$ ,  $p \leq 0.00$  respectively). According to the stepwise regression, the measurement of low FFMI and SGA predicts 77% of the GLIM score ( $R^2 = 0.620$ ;  $P < 0.00$ ;  $R^2 = 0.770$ ;  $P < 0.00$  respectively).

**Conclusions:** There is a high correlation between PA, and PANDORA score with GLIM criteria in ICU patients. A low FFMI and SGA predict the GLIM malnutrition criteria with a high level of precision. GLIM malnutrition assessment seems to be acceptable in the ICU setting.

## Reference

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**Disclosure of Interest:** None declared.

## Oral Communication I : Critical Care

### OR01

#### COMBINATION OF ENTERAL AND PARENTERAL NUTRITION IN COMPARISON TO ENTERAL NUTRITION ALONE– DOES COMBINATION TIMING MATTER?

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**Rationale:** A combination of enteral nutrition (EN) and parenteral nutrition (PN) may avoid large nutrition debts in critically ill patients. One strategy is the combined use of EN and PN (EN + PN) starting early after admission to the intensive care unit. Another possibility is the early initiation of EN with delayed start of supplemental PN if the nutritional targets cannot be reached (SPN).

In our recent meta-analysis (under submission) evaluating influence of the route of administration EN alone vs. a combination of EN and PN, heterogeneity was observed with regards to publication date and supplementation strategies. This subgroup analysis investigates the influences of a) publication year (before or after 2000) and b) the supplementation strategy (EN + PN or SPN) on 30-day mortality and hospital length-of-stay (LOS).

**Methods:** The detailed methodology was previously published ([www.criticalcarenutrition.com](http://www.criticalcarenutrition.com)). In short, randomized controlled trials (RCTs) targeting the effect of EN alone vs. a combination of EN and PN in critically ill and mechanically ventilated patients were systematically identified and pooled in a meta-analysis.

Of the 10 RCTs meeting the inclusion criteria, 5 were published before 2000 and 5 afterwards, 8 RCTs compared EN + PN to EN alone and 2 RCTs compared SPN to EN alone. Dichotomous variables are presented as risk ratio (RR), continuous variables as weighted mean difference (WMD) with 95% confidence intervals (CI).

**Results:** Detailed results are displayed in the table 1. Including all studies, on average, there was no treatment effect on 30-day mortality with a combination of EN and PN (RR 1.00, CI 0.70, 1.41, 10 studies,  $n = 880$ ,  $p = 0.98$ , heterogeneity  $I^2 = 41\%$ ) compared to EN alone. A combination of EN and PN compared to EN alone was, on average, associated with a trend towards a reduced LOS (WMD  $-3.14$ , 95% CI  $-6.46$ , 0.18, 6 studies,  $n = 771$ ,  $p = 0.06$ , heterogeneity  $I^2 = 38\%$ ). In the subgroup of EN+PN vs. EN, the overall mean difference was significant ( $-4.38$  [ $-8.53$ ,  $-0.24$ ],  $p = 0.04$ ), whereas in the SPN vs. EN subgroup no influence was observed.

Outcome	Group	Studies	RR or WMD [95% CI]	p-Value	Interpretation
30-day mortality	EN+PN vs. EN	8	1.01 [0.64, 1.60]	0.96	RR values >1 favor EN alone
	SPN vs. EN	2	0.96 [0.50, 1.82]	0.89	
	Before 2000	5	1.27 [0.82, 1.94]	0.28	
	After 2000	5	0.77 [0.47, 1.27]	0.31	
	<b>All trials included</b>	<b>10</b>	<b>1.00 [0.70, 1.14]</b>	<b>0.98</b>	
Hospital-LOS	EN+PN vs. EN	4	$-4.38$ [ $-8.53$ , $-0.24$ ]	0.04	
	SPN vs. EN	2	$-1.00$ [ $-5.25$ , $3.25$ ]	0.64	
	<b>All trials included</b>	<b>6</b>	<b><math>-3.14</math> [<math>-6.46</math>, <math>0.18</math>]</b>	<b>0.06</b>	

**Conclusions:** Regarding mortality, a combination of enteral and parenteral nutrition is non-inferior to enteral nutrition alone. An early combination of EN+PN might be more effective than SPN to reduce hospital-LOS.

**Disclosure of Interest:** None declared.



## OR02 A NEW PROGNOSTIC INDICATOR IN SEPTIC SHOCK: MUSCLE MASS MEASURED BY THE THICKNESS OF QUADRICEPS IN ULTRASOUND

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**Rationale:** Low skeletal muscle mass in critically ill patients has been independently associated with prolonged mechanical ventilation, prolonged ICU and hospital length of stay and mortality. Assessing body composition remains challenging in ICU. Ultrasonography (US) has recently been suggested to measure muscle volume and architecture and may monitor acute muscle wasting in critically ill patients.

**Methods:** It was an observational, prospective study, in Medical Intensive Care of Rouen University Hospital. Patients were included between April and October 2017. The primary aim was to evaluate relationship between D1–D4 thickness delta of quadriceps muscle and D28 mortality. Bioelectrical impedance was also evaluated in this population.

**Results:** A total of thirty-four patients were included. The median of D1–D4 delta thickness was  $-6.77\%$  and was defined as cut off. Mortality was increased when the loss of thickness was more than  $6.77\%$  ( $p=0.02$ ; IC [0.0015; 0.7157]), with  $88\%$  of Sensibility (IC [50;99]),  $64\%$  of Specificity (IC[42;82]). Higher average loss of thickness was associated of D28 mortality ( $13\%$  for dead-patients,  $1.8\%$  for alive-patients,  $p=0.02$ ). Bioelectrical impedance was not correlated with mortality.

**Conclusions:** An earlier loss of quadriceps muscle thickness more than  $6.77\%$  is associated with mortality in septic shock. The assessment by ultrasonography of the quadriceps muscle thickness may constitute a promising tool to evaluate acute muscle wasting and the effect of nutritional-based interventions on muscle wasting in critically ill patients.

**Disclosure of Interest:** None declared.

## OR03 NUTRITIONDAY ICU: ANNULAR CHANGE IN ONSET OF PARENTERAL NUTRITION

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**Rationale:** The timing of parenteral nutrition (PN) was considerably earlier in Europe based on ESPEN guidelines and North America based on ASPEN guidelines. A large European RCT (EPANIC) published in 2011 appeared to confirm a delayed start of PN. The controversy persists and a recent French trial appears to allow early start of full PN and more side-effects with early full enteral nutrition.

We investigated in the nutritionDay cohort whether the start of PN or EN was changed after 2011 in Europe.

**Methods:** 8829 of 13043 patients from the 2007–2015 nutritionDay ICU cohort were admitted in Europe. General linear modeling (R 3.3.1) of the starting day for PN and EN was used and adjusted for countries,

age, gender, SOFA Score reason for ICU dependency and duration since admission. Data are given as mean with 95% confidence intervals.

**Results:** On nutritionDay nutrition was enteral for 3283 (37%) patients, parenteral for 1230 (14%) and combined for 1093 (12%). Age was 65 years and proportion of women was 35–40% over the years. 52–71% were ventilated and 31–35% needed vasoactive drugs. Predicted mortality was 41% with enteral, 35% with parenteral and 37% with combined nutrition. Observed mortality was 33%, 32% and 38%. 60 days after nutritionDay 34% of patients on artificial nutrition had died and 15% were still hospitalised.

Start of PN was similar between 2007 and 2010. In 2011 PN start was delayed by 5.86 (CI95 3.49;8.23) days ( $P < 0.0001$ ), in 2012 4.72 (CI95 2.18;7.26) and in 2013 3.15 (CI95 0.47; 5.83) and decreased to 2.29 and 1.12 days in 2014 and 2015. A similar time profile was found for combined nutrition but not for enteral nutrition.

**Conclusions:** Published research may have triggered an abrupt delay of parenteral and combined enteral and parenteral nutrition in Europe that was reversed within 4 years.

### Reference

Literature: Casaer NEJM 2011; Reignier Lancet 2017.

**Disclosure of Interest:** None declared.

## OR04 ASSESSING THE APPROPRIATE ENERGY EXPENDITURE REQUIREMENT USING INDIRECT CALORIMETRY FOR LIVER TRANSPLANT RECIPIENTS

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**Rationale:** The aim of this study was to compare predictive equations with indirect calorimetry and identify the appropriate energy expenditure requirement of liver transplant recipients in South Korea.

**Methods:** This prospective observational study was conducted in a surgical intensive care unit (ICU) in an academic tertiary hospital. Fifty mechanically ventilated patients who had received LTs and were expected to stay in the ICU more than 2 days were studied. Resting energy expenditure (REE) was measured 48 hours after ICU admission using open-circuit indirect calorimetry. Theoretical REE was estimated using three predictive equations: Harris-Benedict methods, Ireton-Jones ventilated, and Penn state 1988. The REEs derived from each predictive equation were compared with the measured REE using an intraclass correlation coefficient (ICC) and a Bland-Altman plot.

**Results:** Except for 4 patients who were extubated within 36 hours, 46 patients were enrolled ( $n=46$ ). Penn-state 1988 equation showed 65% agreement (ICC 0.65) and Harris-Benedict method showed 56% agreement (ICC 0.56) with indirect calorimetry measurement which was statistically significant ( $p < 0.001$ ), while the other predictive equation showed poor agreement. The mean difference between the measured and predicted REE for each method was as follows: Harris Benedict method,  $148.50 \pm 247.67$  kcal; Ireton-Jones ventilated,  $-105.30 \pm 284.72$  kcal; and Penn state 1988,  $-52.49 \pm 249.86$  kcal (Table 1) All three predictive equations seemed to have fixed bias, but Penn state 1988 method seemed to have the least. Harris Benedict method tended to underestimate REE, while Ireton-Jones ventilated and Penn state 1988 tended to overestimate REE.

**Table 1**  
Intraclass correlation coefficients and mean difference between measured and predicted REE.

Predictive equation	Intraclass correlation coefficient between predicted and measured REE	P-value	Mean difference between predicted and measured REE (Kcal)
Harris-Benedict method	0.56	<0.001	148.50 ± 247.67
Iretton-Jones (ventilated)	0.39	0.004	−105.30 ± 284.72
Penn State 1988	0.65	<0.001	−52.49 ± 249.86

**Conclusions:** All three predictive equations showed unsatisfactory agreement with measured REE, which all had a fixed bias and appeared to be inaccurate for predicting REE for LT recipients. Therefore, precise measurements using indirect calorimetry may be helpful when treating critically ill patients to avoid underestimating or overestimating their metabolic needs.

**Disclosure of Interest:** J.-K. Baek Grant/Research Support from: GE healthcare for indirect calorimetry, S.-J. Lee Grant/Research Support from: GE healthcare for indirect calorimetry, H.-J. Lee Grant/Research Support from: GE healthcare for indirect calorimetry, Y.-J. Jung Grant/Research Support from: GE healthcare for indirect calorimetry, S.-K. Hong Grant/Research Support from: GE healthcare for indirect calorimetry.

**OR05**  
**EFFECT OF CONTINUOUS VENO-VENOUS HEMOFILTRATION ON MEASUREMENT OF RESTING ENERGY EXPENDITURE BY INDIRECT CALORIMETRY. RESULTS FROM THE MECCIAS TRIAL**

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**Rationale:** Measuring resting energy expenditure (REE) in patients undergoing continuous renal replacement therapy (CRRT) is challenging. Indeed, indirect calorimetry (IC) fails to capture CO<sub>2</sub> removal over the filter, CRRT induces immunologic changes that activate metabolism, and CRRT-induced heat loss and citrate anticoagulation may have a significant metabolic impact.

**Methods:** The trial was registered at clinicaltrials.gov (NCT03314363). REE was measured with IC in 10 ventilated critically ill adult patients in 4 different settings: standard continuous veno-venous hemofiltration (CVVH), high-dose CVVH (50 ml/kg/h of effluent), standard CVVH with citrate replaced by NaCl 0.9%, and no CVVH. Gas flow was measured at different sample points within the CRRT circuit using blood gas analysis. Loss of CO<sub>2</sub> and O<sub>2</sub> into the effluent was added to calculation of REE.

$$\text{REE}_{\text{total}} = \text{REE}_{\text{IC}} + \text{REE}_{\text{effluent}} = (3.94 \times \text{VO}_2 + 1.1 \times \text{VCO}_2)_{\text{IC}} + (3.94 \times \text{VO}_2 + 1.1 \times \text{VCO}_2)_{\text{effluent}}$$

**Results:** REE without CVVH was 1706 ± 702 Kcal/day. Wilcoxon matched paired rank test showed statistically significant difference between standard and high dose (p = 0,037), standard vs no-citrate (p = 0,020), and standard vs no CVVH (p = 0,049).

**Table 1**  
(Values are means ± standard deviation).

	Standard CVVH	High-dose CVVH	CVVH without citrate
CO <sub>2</sub> loss in effluent (ml/min)	23 ± 5	34 ± 16	22 ± 4
REE change due to CO <sub>2</sub> loss in effluent (%)	+2.3 ± 0.9	+4.0 ± 2.0	+2.5 ± 1.1
REE (Kcal/day)	1970 ± 907	1766 ± 745	1643 ± 635

**Conclusions:** Measuring REE during CVVH underestimates the true value by 2 to 4%. Metabolism is lower in the absence of CVVH. REE is lower in high-dose CVVH than in standard CVVH, which may be due to heat loss and lower body temperature. Replacing citrate by NaCl 0.9% diminishes REE which suggests citrate-induced metabolic alterations.

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**OR06**  
**THE USE OF PROBIOTICS AS A PREVENTATIVE MEASURE AGAINST SURGICAL SITE INFECTIONS IN MULTIPLE TRAUMA ICU PATIENTS: A PRELIMINARY STUDY**

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**Rationale:** Probiotics have been proposed as an adjunct means of reducing infections in highly susceptible patients, such as multiple-trauma, surgical and/or ICU patients. Their efficacy on reducing surgical site infections [SSIs] has not been fully demonstrated. The purpose of our study was to elucidate the role of probiotics for prevention of SSIs in a high-risk patient population, namely multiple trauma ICU patients.

**Methods:** This randomized, placebo-controlled study included 58 multiple trauma patients that required surgical intervention and subsequently ICU treatment with or without mechanical ventilation for ≥10 days. Patients were randomly allocated to the probiotic [n = 28] or placebo group [n = 30]. A commercially available, 4 probiotic combination was used. Patients received two capsules of the probiotic or placebo from days 1–15 of their ICU stay through a nasogastric tube. Patients were followed up for the incidence of SSIs, total length of ICU stay and mortality for 30 days.

**Results:** The probiotics group demonstrated a significant decrease in the incidence of SSIs [10.7% vs 26.6%, p = 0.014, RR placebo = 5.4 (95% CI 2.4–11.9)] compared to the placebo group. In addition, the need for prolonged ICU stay [≥30 days] was also significantly decreased [7.1% vs 40%; p = 0.002; RR placebo = 2.8 (95% CI 1.7–4.1)] in the probiotics group compared to placebo. 30-day mortality remained unaffected between the two groups [10.7% probiotics vs 6.7% placebo].

**Conclusions:** In the present study, probiotic appeared able to reduce the incidence of SSIs and total ICU stay in a subgroup of surgical, multiple-trauma, ICU patients that are traditionally prone to septic complications.

**Disclosure of Interest:** None declared.



### OR07 PROGNOSTIC FACTORS FOR CLINICAL AND NUTRITIONAL OUTCOMES IN CRITICALLY ILL PATIENTS WITH ENTERAL FEEDING INTOLERANCE: FOLLOW-ON ANALYSES FROM THE PROMOTE TRIAL

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**Rationale:** The optimal definition of enteral feeding intolerance (EFI) in clinical practice remains uncertain. In PROMOTE (Heyland, Intensive Care Med 2019), a randomized, controlled, 5-day study of ulimorelin or metoclopramide in critically ill patients with EFI (one or more episodes of gastric residual volume (GRV)  $\geq 500$  mL), nearly 70% of patients who received volume-based feeding achieved feeding success; rates of vomiting and aspiration were low. The aim of the current study was to explore more predictive factors of clinical outcomes in EFI.

**Methods:** Pooled data from PROMOTE were analyzed to assess the impact of various factors (BMI, weight, concomitant medications, reason for ICU admission, vomiting, APACHE II, SOFA and NUTRIC scores, days in ICU and mechanical ventilation, repeated GRV episodes) on nutritional intake and outcomes. Associations were explored between % daily protein prescription (%DPP) achieved, feeding success (80% DPP) and safety outcomes in subgroup and regression models. A safety event was defined as death, severe adverse event (AE), or serious AE with 3 days of study completion.

**Results:** In the final model, among pre-treatment factors, only persistent EFI (2 or more episodes of GRV  $\geq 500$ ) ( $p = 0.01$ ) and use of sedatives ( $p = 0.03$ ) were significantly associated with lower %DPP. Two or more episodes within 24 h post-treatment also predicted lower %DPP (61.8% vs. 87.3%,  $p < 0.0001$ ), lower rates of feeding success (42.1% vs. 74%,  $p < 0.0001$ ) and higher rates of safety events (57.1% vs 36.8%,  $p = 0.03$ ). No differences in ventilator-free days, ICU or hospital length of stay (LOS), or 30-day mortality were observed.

**Conclusions:** Repetitive episodes of GRV  $\geq 500$  mL better predicted worse nutrition delivery and more safety events than a single episode, but the frequency of episodes was not associated with VFD, LOS, or 30-day mortality.

**Disclosure of Interest:** M. S. Harris Shareholder of: Lyric Pharmaceuticals, A. van Zanten Consultant for: Lyric Pharmaceuticals, T. Grau-Carmona Consultant for: Lyric Pharmaceuticals, D. Evans Consultant for: Lyric Pharmaceuticals, A. Beishuizen: None declared, M.-A. Garcia-Martinez: None declared, A. Perez Other: Pivotal SL, D. Klein Consultant for: Lyric Pharmaceuticals, D. Heyland Consultant for: Lyric Pharmaceuticals.

### OR08 SURVIVAL ADVANTAGE BY HIGHER LEVELS OF MUSCLE MASS COMPARED TO HIGHER BMI IN CRITICALLY ILL PATIENTS

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**Rationale:** A high BMI is associated with lower mortality, however a low muscle mass (based on L3 CT-scan analysis) is associated with higher mortality (1). It is unclear how independently these risk factors affect survival in critically ill.

**Methods:** 739 critically ill with L3 based CT-scan analysis of muscle mass (muscle area) were included. Low muscle mass was categories according to sex-specific prespecified cutoffs (Normal muscle  $n = 294$  40%, Low muscle  $n = 445$  60%). WHO classification of BMI categories was used (UW = underweight  $n = 27$  4%, NW = normal weight  $n = 385$  52%, OW = overweight  $n = 253$  34%, OB = obese  $n = 74$  10%). Cox regression analysis for 6 months mortality was used for muscle mass (per 100 cm<sup>2</sup>) and BMI category, adjusted for APACHE II score and age (sex was not a confounder). One-way anova and KM survival analysis were applied.

**Results:** Mean age was 58 (SD 18) y, BMI was 25.3 (SD 4.4), APACHE II score 23 (SD 8). The table shows that with increasing BMI category the 6 m mortality decreased, even in the low muscle mass subgroup. Hazard ratios for muscle (HR 0.51, 95%CI 0.34–0.77,  $p = 0.001$ ) and BMI category (HR 0.78, 95%CI 0.65–0.95,  $p = 0.011$ ) were independently associated with 6 m mortality. KM analysis showed different survival for 7 subgroups (as in table;  $p < 0.001$ ) between muscle groups, but less between BMI categories. Long stay obese patients with low muscle mass appear to have slight survival advantage. Muscle mass (cm<sup>2</sup>) was 105 (SD 27) for UW, 138 (SD 39) for NW, 152 (SD 42) for OW, 150 (SD 41) for OB; one-way anova ( $p < 0.001$ ), post-hoc Bonferroni showed no difference between OW and OB.

	UW	NW	OW	OB
NORMAL MUSCLE		20,1%	13,0%	22,9%
LOW MUSCLE	48,0%	41,0%	41,5%	28,2%
ALL	44,4%	33,8%	27,7%	25,7%

**Conclusions:** Survival improved with BMI category in critically ill, also in patients with low muscle mass. This is partly explained by an increase in muscle mass. Survival is more dependent on the level of muscle mass than BMI category. Long stay obese patients with low muscle mass appear to have a survival advantage over low muscle mass patients in other BMI categories.

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### OR09 ANALYSIS OF THE BODY COMPOSITION ON 3RD LUMBAR VERTEBRA (L3)-TARGETED COMPUTED TOMOGRAPHY (CT)-SCAN IN THE INTENSIVE CARE UNIT (ICU): PROGNOSTIC VALUE, INTEROBSERVER REPRODUCIBILITY, AND PREVALENCE OF MUSCLE MASS IMPAIRMENT

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**Rationale:** Low fat-free mass at admission to ICU, as measured by phase angle (1) or psoas area index (2), predicts mortality at 28 days (D28). Objectives: to evaluate if: i) the body composition: areas of total muscle (main objective), psoas, subcutaneous (SAT), visceral (VAT), intra-muscular (IMAT), intra-psoas (PAT) and total (TAT) adipose tissues (secondary objectives), assessed on a L3-targeted CT scan, predicted D28 mortality; ii) interobserver reproducibility; iii) prevalence of muscle mass impairment.

**Methods:** Ancillary study of the multicentric international PHASE ANGLE PROJECT (n = 931) (1). Inclusion criteria: routine abdominal CT scan within 9 days of admission. Body composition analysis using ImageJ software (NIH, USA). Statistics: Area under the curve (AUC) ROC. Multivariate logistic regression: variables associated with mortality at D28. Analysis of 33 blind scanners. Impaired muscle mass defined by: total muscle area/height (m)<sup>2</sup> <38.9 (female) or <55.4 cm<sup>2</sup>/m<sup>2</sup> (male).

**Results:** 210 included patients: 55% males, 62 ± 17 years, APACHE II 20 ± 9, 50/50% medical/surgical patients. In females, high IMAT, VAT and TAT indexes were associated with D28 mortality (p = 0.03, p = 0.02, p = 0.02, respectively). In males, low total muscle area and psoas indexes, total muscle and psoas areas were associated with D28 mortality (p = 0.01, p = 0.003, p = 0.003, p < 0.001, respectively). Total muscle area was predictive of mortality with better reliability in males (AUC = 0.74) than in females (AUC = 0.61). Multivariate analysis: 1<sup>st</sup> quartile of total muscle area (<96 (F) or <118 (H) cm<sup>2</sup>) (odds ratio = 2.5 [95% CI, 1.0–6.1], p = 0.04), age > 65 years (2.8 [1.1–7.3], p = 0.03), and phase angle at admission (2.71 [1.1–6.6], p = 0.03) were associated with D28 mortality. Inter-observer reproducibility was good with visceral and total adipose tissues (correlation coefficient r = 0.99), total muscle area (r = 0.72), and psoas area (r = 0.90). Prevalence of impaired muscle mass: 57% (total); 35% (females); 74% (males).

**Conclusions:** The total muscle area expressed in cm<sup>2</sup> is associated with D28 mortality. There is good interobserver reproducibility of body composition parameters measured by L3-targeted CT-scan. More than half of the ICU patients had impaired muscle mass. This study confirms the importance of lean mass measurement in assessing the prognosis of the ICU patient.

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**Disclosure of Interest:** None declared.

## Oral Communication II : GI + Liver

### OR10

#### GUT MICROBIOTA DEPLETION AFFECTS METABOLIC AND BEHAVIORAL RESPONSES DURING ACTIVITY-BASED ANOREXIA

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**Rationale:** The role of the gut-brain axis in eating behavior and anxiety-depressive disorders has gained increasing attention. Although gut microbiota dysbiosis has been reported in anorectic

patients, its pathophysiological role remains poorly understood. Thus, we aimed to characterize the potential role of gut microbiota by evaluating the effects of its depletion in the Activity-Based Anorexia (ABA) mouse model.

**Methods:** Male C57Bl/6 (n = 16/group) were submitted (ABA group) or not (CT group) to the ABA protocol, which combines access to a running wheel with a progressive limited food access. Gut microbiota was previously depleted or not by antibiotics (ATB) gavages. Body composition, anxiety-like behavior, plasmatic levels of leptin and adiponectin, hypothalamic and hippocampal mRNA levels for neuropeptides, dopamine receptors (DRD) and inflammatory factors were assessed. Data were compared by two-way ANOVA followed by Bonferroni post-tests.

**Results:** Body weight loss was less pronounced in ABA+ATB (10.0 ± 6.5%) compared to ABA (15.1 ± 6.0%, p < 0.01). An increased fat mass and a decreased lean mass were observed in ABA+ATB compared to ABA (p < 0.001), which was linked with increased levels in plasmatic adiponectin (p < 0.05). In contrast, plasmatic leptin levels were decreased in both ABA and ABA+ATB mice (p < 0.05). ABA+ATB mice showed decreased physical activity compared to ABA (p < 0.05). During open field test, only ABA+ATB mice exhibited lower travelled distance, increased immobility time and lower vertical activity, suggesting increased anxiety. In the hypothalamus, CRH (Corticotropin Releasing Hormone) mRNA upregulation observed in ABA was blunted in ABA+ATB (p < 0.05). Similarly, in the hippocampus, DRD1, DRD2 and TNF-α mRNA were increased in ABA compared to CT, but not in ABA+ATB.

**Conclusions:** Gut microbiota depletion triggers alterations of metabolic and behavioral responses in the ABA murine model of anorexia.

**Disclosure of Interest:** None declared.

### OR11

#### THE IMPACT OF PRETRANSPLANT SARCOPENIA AND PERIOPERATIVE REHABILITATION WITH NUTRITIONAL THERAPY ON OUTCOMES AFTER LIVING DONOR LIVER TRANSPLANTATION: A PROSPECTIVE STUDY

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**Rationale:** There has been no prospective study to examine the impact of pretransplant sarcopenia nor the effect of perioperative rehabilitation with nutritional therapy on outcomes after LT. Therefore, we prospectively investigated the impact of pretransplant sarcopenia and perioperative rehabilitation with nutritional therapy on outcomes after adult living donor LT (LDLT).

**Methods:** This prospective study included 44 consecutive patients (22 males and 22 females) who underwent adult LDLT from November 2015 to June 2018 except acute liver failure. Median age was 55 (44–61). Pretransplant sarcopenia was defined as follows: low skeletal muscle mass index (SMI) (<40.31 cm<sup>2</sup>/m<sup>2</sup> for men and <30.88 cm<sup>2</sup>/m<sup>2</sup> for women) and decreased muscle strength (handgrip strength <26 kg for men and <18 kg for women) or impaired physical performance (gait speed <0.8 m/s). Firstly, patients were categorized into three groups as follows: sarcopenia group (low SMI, low handgrip strength and/or low gait speed) (n = 3), normal group (normal SMI, normal handgrip strength and normal gait speed) (n = 28) and presarcopenia group (the others) (n = 13). Secondly, patients were categorized into two groups as follows, because the number of the sarcopenia group was small: normal group (n = 28) and abnormal group (presarcopenia group + sarcopenia group) (n = 16). Patient demographics, peritransplant outcomes and posttransplant 1-year patient survival rate were compared among the groups. All patients received perioperative nutritional treatment and rehabilitation.

**Results:** Experiment 1: Among the three groups, significant differences were seen in BMI ( $p=0.036$ ), MELD score ( $p=0.039$ ), graft-to-weight ratio (GRWR) ( $p=0.025$ ), and SMI ( $p<0.001$ ). No significant difference was seen in the posttransplant complications. Postoperative hospital stay was the longest in the sarcopenia group among the three groups. Posttransplant patient survival rates were comparable among the three groups. Experiment 2: Patients in the abnormal group had significantly higher GRWR ( $p=0.022$ ), lower SMI ( $p=0.005$ ), higher intramuscular adipose tissue content ( $p=0.047$ ) compared with the normal group. Operative blood loss in the abnormal group was significantly larger than the normal group ( $p=0.028$ ). No significant difference was seen in the posttransplant complications and the postoperative hospital stay between the two groups. The period from LDLT to the first walk in the abnormal group was longer than the normal group ( $p=0.085$ ).

**Conclusions:** Patients with pretransplant sarcopenia or presarcopenia had larger operative blood loss and later recovery after LDLT than normal group. However, posttransplant survival rates were comparable among the three groups probably due to our perioperative rehabilitation and nutritional therapy.

**Disclosure of Interest:** None declared.

#### OR12

##### CHANGE OF GUT BARRIER MARKERS FOLLOWING THE MEDITERRANEAN DIET IN THE LIFESTYLE INTERVENTION STUDY IN WOMEN AT RISK FOR HEREDITARY BREAST CANCER (LIBRE)

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**Rationale:** A number of small intervention studies suggested that the Mediterranean diet (MedD) and physical activity can lower the risk for breast cancer. LIBRE is the first large multicenter RCT to test the effect of these lifestyle factors on the incidence of breast cancer in women at risk because of BRCA mutations [1]. LIBRE also offers to unravel underlying mechanisms such as the role of the intestinal barrier for beneficial effects of such lifestyle interventions.

**Methods:** We examined the effect of lifestyle intervention on the gut barrier markers albumin, calprotectin and zonulin, all measured in feces, as well as lipopolysaccharide-binding protein (LBP) measured in plasma. From the ongoing LIBRE trial we included all complete datasets (259 women; mean age  $44.4 \pm 11$  years). The participants were randomized into an intervention group (IG) trained for MedD and physical activity, and a usual care control group (CG). Adherence to the MedD was assessed at baseline and after 3 months (V1) using the validated Mediterranean Diet Adherence Screener (MEDAS).

**Results:** At baseline there was no difference between the groups regarding the barrier markers. Albumin levels did neither alter during intervention nor between groups. At V1 the CG showed higher levels of calprotectin ( $p<0.05$ ) and lower levels of zonulin ( $p<0.05$ ) compared to the IG. The level of LBP decreased in both groups ( $p<0.05$ ). The level of zonulin correlated inversely with the MEDAS score ( $p<0.001$ ).

**Conclusions:** There were positive changes in the gut barrier markers in the course of the study. Higher adherence to the MedD seems to positively influence gut barrier function, which might be protective against breast cancer outbreak.

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**Disclosure of Interest:** None declared.

#### OR13

##### OCCURRENCE OF REFEEDING SYNDROME IN SARCOPENIC PATIENTS SUBMITTED BY DIGESTIVE TRACT SURGERY IN HOSPITAL DO SERVIDOR PÚBLICO DE ESTADUAL DE SÃO PAULO, BRAZIL

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**Rationale:** Sarcopenia can be a predictive factor for the occurrence of refeeding syndrome (RS). Therefore, new methods of diagnostic analysis of sarcopenia should be explored to prevent this syndrome.

**Methods:** A cross-sectional, retrospective study was carried out in the second half of 2018 at Hospital do Servidor Público Estadual de São Paulo (Brazil) in patients undergoing digestive surgery. The psoas muscle area and its index (psoas muscle area by squared height) were evaluated by computed tomography, for the diagnosis of sarcopenia and review of charts for the analysis of the occurrence of RS.

**Results:** Fifty-two patients were evaluated, of which 13.4% presented RS at some time during the surgical hospitalization, of which 57.1% had psoa index equivalent to sarcopenia. Regarding the occurrence of RS in the Sarcopenic group (SG), this represents 16% of the group, and the incidence of RS in the non-sarcopenic group (NSG), is equivalent to 11.5%. It was not statistically significant the occurrence of SR in the SG and NSG.

**Conclusions:** There is no way to state that sarcopenia is an isolated factor for the occurrence of RS in the studied group, but it is possible to infer that this syndrome has a range that goes beyond the nutritional state. Thus, even groups of patients who do not present sarcopenia may evolve with RS. Further studies with larger samples are needed to confirm these findings and their statistical significance, although the SG has a non-statistical trend of higher RS incidence.

**Disclosure of Interest:** None declared.

#### OR14

##### EFFECTS OF FOOD AND GASTROINTESTINAL SECRETIONS ON INTESTINAL INTEGRITY IN AN EXPERIMENTAL RAT MODEL

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**Rationale:** Paracellular intestinal permeability is mediated mainly by tight junction (TJ) proteins. Deterioration of TJ proteins and morphological structure of intestinal epithelium may result in translocation of bacterial end-products. The aim of this study was to investigate effect of biliopancreatic secretions and food on intestinal morphology and microbial flora of rat intestine.

**Methods:** Thirty Sprague-Dawley male rats were randomly divided into three groups. (10 per groups): Control, biliopancreatic (BP) and jejunal by-pass (JP) groups. With these procedures biliopancreatic juice deficient (bile(-)), food deficient (food(-)) and both of them deficient (bile(-)/food(-)) jejunal segments and corresponding control intestinal segments were obtained. Animals were sacrificed at the end



of week 3. Lipopolysaccharides (LPS) and citrulline levels were studied in venous blood samples. Jejunal segments were cultured quantitatively ( $\log_{10}(\text{cfu/mg})$ ). We observed the changes in the intestinal morphology (villus/crypt ratio, intraepithelial lymphocytes) and expression and distribution of tight junction proteins (occludin, claudin-1, Zonula Occludens-3) by using immunohistochemistry.

**Results:** Villus height to crypt depth ratio was lower in the bile and food deficient segment compared to other groups ( $p: 0.007$ ). Intraepithelial lymphocytes were significantly high in the bile and food deficient segment ( $p: <0.001$ ). Immunohistochemical staining pattern of claudin-1 was weaker when there was no food ( $p: 0.035$ ). Occludin expression increased if the segment contained food (0.016). Jejunal aerobic bacterial count decreased in bile and food deficient segment ( $\log_{10}(\text{CFU/mg}): -1.32 \pm 0.61$ ) and increased in bile deficient segment ( $\log_{10}(\text{CFU/mg}): 0.1 \pm 1.08$ ) when compared with control group ( $\log_{10}(\text{CFU/mg}): -0.3 \pm 0.6$ ) ( $p: 0.043$ ). There were no statistically significant difference in plasma lipopolysaccharides and citrulline levels between groups.

**Conclusions:** In our study; the presence or absence of bile and pancreatic secretions altered jejunum morphology, the number of intraepithelial lymphocytes, and the expression of some TJ proteins (occludin, claudin-1). These effects were more prominent in the presence or absence of food. The microbiological environment also affected by these changes. Our results implicate the importance of oral food on the structure and integrity of the gastrointestinal tract compared to gastrointestinal secretions.

**Disclosure of Interest:** None declared.

#### OR15 DOES THE LOW-CALORIE DIET AND PROBIOTIC SUPPLEMENTATION INFLUENCED ON INTESTINAL BARRIER AND MICROBIOME IN OVERWEIGHT AND OBESE SUBJECTS?

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**Rationale:** The gut microbiota composition is an important factor of maintaining intestinal barrier in overweight and obese subjects. Zonulin affects the integrity of intercellular *tight junction* and can be an indicator of the intestinal permeability. **The aim of the study** was to find the relationships between low-calorie diet, probiotic supplementation, zonulin levels, and microbiome in faecal samples.

**Methods:** It was a randomized, double-blinded placebo controlled trial. The study involved 56 overweight or obese volunteers, divided in two groups: Placebo ( $n = 20$ ) and Probiotic ( $n = 36$ ). They were on low-calorie diet (acc. to European Clinical Practice Guidelines) and were supplemented with Sanprobi SF for 3 months. Gut microbiome was tested using KyberKompact. Zonulin levels in faces were assessed using ELISA method.

**Results:** Significantly higher zonulin levels were found in patients who lose more than 5.5 kg of weight in the Placebo group before the study ( $P = 0.0426$ ) and lower in Probiotic group, after diet ( $P = 0.0464$ ). A negative correlation in Probiotic group was found between zonulin levels and the number of *Bifidobacterium spp.* ( $R = -0.47$ ) and *Enterococcus spp.* ( $R = -0.36$ ) before the study and a negative correlation was found between zonulin levels and *E. coli* ( $R = -0.49$ ) and *Enterococcus spp.* ( $R = -0.47$ ) in the end. Significant negative correlation between zonulin levels and bacteria performing protective functions ( $R = -0.78$ ) in Placebo group after diet was found.

**Conclusions:** Our findings indicate that diet therapy and probiotic supplementation influenced the intestinal permeability. Correlation between zonulin levels and bacteria from immunostimulatory and protective groups suggests that the dysbiosis in gut microbiome is

probably associated with the intestinal permeability and that weight lose can be helpful in intestinal barrier repair.

**Disclosure of Interest:** None declared.

#### OR16 IMPACT OF CHOLECYSTECTOMY ON THE FECAL BILE ACIDS PROFILE BEFORE AND AFTER ROUX EN-Y GASTRIC BYPASS

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**Rationale:** Changes in bile acids (BA) type and profile have been considered as a potential effector of glucose homeostasis after bariatric surgery. We here evaluated whether cholecystectomy, a common procedure in bariatric patients, can impact the fecal BA profile before and after Roux-en-Y gastric by-pass (RYGB).

**Methods:** Fecal samples were collected before surgery and 3 and 12 months after RYGB from diabetic obese women who underwent cholecystectomy (COLE;  $n = 7$ ) or not (NOCOLE;  $n = 13$ ). Fecal BA profile was accessed by liquid chromatography coupled to tandem mass spectrometry in a targeted approach.

**Results:** COLE and NOCOLE patients exhibited different fecal BA profile at preoperative period, with higher levels of cholic, chenodeoxycholic, glycochenodeoxycholic, and taurochenodeoxycholic acids in COLE than in NOCOLE (Mann Whitney,  $p < 0.05$ ). This BA profile was sensitive to RYGB: after surgery at both 3 (Anova,  $p = 0.006$ ) and 12 months (Anova,  $p = 0.047$ ), deoxycholic acid decreased in NOCOLE and increased in COLE, compared to the preoperative period.

**Conclusions:** Cholecystectomy affects fecal BA profile and its answer to RYGB in diabetic obese women and should be considered as a potential bias in studies assessing the influence of BA in regulating the glycemic homeostasis after the procedure. Furthermore, the effect of cholecystectomy on the metabolic response of RYGB should be studied.

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**Disclosure of Interest:** None declared.

#### OR17 BARIATRIC SURGERY AMELIORATES THE METABOLIC PHENOTYPE AND IMPROVES THE GUT MICROBIOTA IN PATIENTS WITH OBESITY

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**Rationale:** Obesity is a common metabolic chronic disease, which was associated with gut microbiota dysbiosis. Bariatric surgery is a promising and effective method for weight loss. This study aims to investigate the effect of bariatric surgery on clinical metabolic parameters and gut microbiota alteration in morbidly obese patients.

**Methods:** Forty eight patients were enrolled and glucose and lipid parameters were evaluated before and after surgery. Twelve patients provided fresh stool sample before and after surgery, which was then

applied for 16S rRNA sequencing and the data were analyzed to decipher the gut microbiota architecture alteration.

**Results:** The mean age of the patients was  $34.00 \pm 10.62$  years old. The average BMI was  $39.82 \pm 6.20$  and  $29.55 \pm 5.16$  Kg/m<sup>2</sup> before and after surgery (average 7 months), respectively. Blood pressure, glucose and lipid metabolic parameters and inflammatory markers were significant improved after bariatric surgery ( $P < 0.01$ ). The circulation concentration of testosterone was also improved both in male and female. The gut microbiota composition was improved significantly before and after surgery ( $P = 0.004$ ). The relative abundance of Actinobacteria (0.33% vs. 2.62%,  $P = 0.02$ ) increased significantly after the surgery. At the genus level, *Escherichia-Shigella* (21.87% vs. 2.49%,  $P = 0.035$ ) decreased while *Streptococcus* (1.28% vs. 10.85%,  $P < 0.001$ ) and *Collinsella* (0.23% vs. 2.07%,  $P = 0.02$ ) increased significantly. Microbial function alteration and network were also revealed due to the bariatric surgery.

**Conclusions:** Bariatric surgery was an effective method to improve the inordinate glucose and lipid metabolism, as well as the gut microbiota in morbidly obese patients.

**Disclosure of Interest:** None declared.

#### OR18

##### THE CLINICAL EFFECT OF PREOPERATIVE LEVEL OF 25-OH-VITAMIN D3 ON THE LIVER TRANSPLANT RECIPIENTS

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**Rationale:** Vitamin D deficiency is common in patients of chronic liver disease and has been associated with infection and mortality. The aim of this study is to determine whether preoperative vitamin D levels affect clinical outcomes after liver transplantation.

**Methods:** This was a single-center retrospective study. Between August and October 2017, a total of 110 patients underwent liver transplantation. The primary outcome was the relationship between serum 25-OH-vitamin D<sub>3</sub> (25(OH)D<sub>3</sub>) level before liver transplantation and length of stay (LOS) in the intensive care unit (ICU). Secondary outcomes included the duration of normalization of inflammatory marker, such as white blood cell count (WBC) & C-reactive protein (CRP) after liver transplantation, new infection rates, rejection rates, hospital LOS and mortality among 25(OH)D<sub>3</sub> level.

**Results:** Among 110 liver transplant recipients, 45.5% of patients were malnourished. The mean 25(OH)D<sub>3</sub> level was  $16.7 \pm 12.1$  ng/ml (range 2~50) and 42 (38.2%) patients had low levels of  $< 10$  ng/ml. The mean ICU LOS was  $6.4 \pm 14.9$  days, and the mean hospital LOS was  $35.0 \pm 31.6$  days. Based on the mean 25(OH)D<sub>3</sub> level, ICU LOS ( $9.0 \pm 18.3$  vs  $1.9 \pm 1.5$ ,  $p = 0.002$ ) and hospital LOS ( $41.1 \pm 37.8$  vs  $24.7 \pm 11.5$ ,  $p = 0.001$ ) were significantly longer in the lower group. The incidence of new infections tended to increase in the low 25(OH)D<sub>3</sub> level group (29.0% vs 12.2%,  $p = 0.072$ ). The higher NRS2002 score (Odds ratio 3.69, 95% confidence interval 1.30 – 10.45,  $p = 0.014$ ) and low 25(OH)D<sub>3</sub> levels (Odds ratio 0.74, 95% confidence interval 0.58–0.95,  $p = 0.018$ ) were statistically significant as a risk factor for the poor outcome group who had been in the ICU more than one week.

**Conclusions:** The low 25(OH)D<sub>3</sub> levels and malnutrition before liver transplantation showed an increase in the length of stay in ICU and hospital. Our study showed that low 25(OH)D<sub>3</sub> levels were an independent risk factor for poor outcome after liver transplantation. It is necessary to prospectively analyze the effect of vitamin D supplements on clinical outcomes in liver transplant recipients.

**Disclosure of Interest:** None declared.

## Oral Communication III : Macronutrients

#### OR19

##### STRIATAL ACTIVITY DECREASES FOLLOWING THE INTRAGASTRIC INFUSION OF GLUCOSE AND LIPIDS IN LEAN HUMANS

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**Rationale:** Striatal dopamine signaling is involved in reward and the motivation to eat. Animal studies showed that nutritional signals that arise following the ingestion of nutrients induce striatal dopamine release. These post-ingestion nutritional signals may therefore play an important role in the rewarding aspects of food consumption and the regulation of feeding behavior. To study this in humans, we assessed the taste- and preference-independent effects of glucose and lipids on striatal activity in lean humans.

**Methods:** In 15 lean humans, we assessed the effects of direct intragastric infusions of glucose 50% (250 ml, 500 kcal), Intralipid<sup>®</sup> (250 ml, 500 kcal) and water (250 ml) on the BOLD signal of striatal subregions (the nucleus accumbens, the caudate nucleus and the putamen), using functional MRI.

**Results:** Relative to the infusion of water, intragastric glucose infusion induced a significant decrease in BOLD signal in the nucleus accumbens ( $p < 0.001$ ), caudate nucleus ( $p = 0.049$ ) and putamen ( $p = 0.006$ ). The intragastric Intralipid<sup>®</sup> infusion induced a significant decrease in the nucleus accumbens ( $p = 0.025$ ) and putamen ( $p = 0.025$ ). There was no difference between the effects of glucose and Intralipid<sup>®</sup> infusion on neuronal activity in these striatal regions.

**Conclusions:** These findings show that, in lean individuals, striatal neuronal activity is reduced following intragastric infusion of macronutrients in a taste- and preference independent manner. These data suggest an important role for post-ingestion nutritional signals in the regulation of hedonic eating behavior. We are currently assessing these post-ingestion nutritional effects in obese individuals before and after weight loss.

**Disclosure of Interest:** None declared.

#### OR20

##### FOUR WEEKS INTAKE OF GALACTO-OLIGOSACCHARIDES DID NOT AFFECT IMMUNE MARKERS IN HEALTHY ADULTS AND PREFRIL ELDERLY

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**Rationale:** Ageing is associated with a decline of physiological function, including immunosenescence, contributing to frailty and comorbidity. Probiotics may improve immune function, e.g. by bacterial production of short-chain fatty acids. Our aim was to compare immune markers in healthy adults and prefrail elderly and to study the impact of galacto-oligosaccharides (GOS) in both groups.

**Methods:** In this double-blind, randomized, placebo-controlled, cross-over trial, 24 healthy adults (33.3% male, age  $38.1 \pm 7.8$  yrs) and 20 prefrail elderly (Fried criteria; 55.0% male, age  $74.3 \pm 3.7$  yrs) received 21.6 g/day GOS and placebo for 4 weeks. CRP by immunoturbidimetry, and cytokine production after 24 h stimulation by 10 µg/ml LPS or PHA



were assessed pre- and post-intervention. IL-1 $\beta$ , IL-6, IL-8, TNF- $\alpha$ , IL-10, IL-12p70, IL-13, IFN- $\alpha$  and IFN- $\gamma$  were measured using CBA and FACS analyses. Gastrointestinal Symptom Rating Scale and Bristol Stool Scale were completed weekly to monitor tolerance of GOS. Healthy adults and prefrail elderly were compared by independent-samples T-tests, the effects of GOS by linear mixed model analyses.

**Results:** Stimulated cytokine levels and serum CRP did not differ between age groups (all  $P \geq 0.255$ ), nor between GOS and placebo interventions (all  $P \geq 0.130$ ). Mean change between pre- and post GOS-intervention on stimulated cytokine levels ranged from -8.5 to 9.5% in prefrail elderly and from -12.5 to 16.5% in adults. GI symptom scores and stool characteristics did not differ between GOS and placebo intervention in adults, nor in prefrail elderly (all  $P \geq 0.058$ ).

**Conclusions:** Immune markers did not differ between prefrail elderly and adults. Four weeks GOS intake did not affect immune markers in prefrail elderly, nor in adults. GOS was tolerated well by both groups. Analysis of microbiota composition is underway.

**Disclosure of Interest:** None declared.

## OR21

### EFFECTS OF N-CARBAMOYL-PUTRESCINE ON MUSCLE PROTEIN METABOLISM IN MALNOURISHED OLD RATS

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**Rationale:** The prevalence of sarcopenia-related dependency increases with the population of elderly people. The efficiency of available treatments being limited, it becomes a major health problem. We showed in healthy young rats that N-carbamoyl-putrescine (NCP), a decarboxylation derivative of citrulline metabolically close to polyamines increases soleus (Sol) muscle protein content. The aim of the present study was to evaluate the effects of NCP on muscle protein content in malnourished old rats and to investigate the underlying signaling pathways involved in the balance between protein anabolism and catabolism.

**Methods:** Malnutrition was induced in 18 month-old rats by a dietary restriction at 50% of their spontaneous intakes for 6 weeks. The animals were then randomized into four groups: 8 malnourished rats (n = 7, MAL group) were sacrificed immediately while the animals of the other groups were housed individually in metabolic cage and received for 4 days their standard diet at 100% of their spontaneous intake, alone (n = 7, REN group) or associated with NCP 1 (n = 7, NCP1 group) or 10 mg/kg/d (n = 7, NCP10 groups). We measured plasma and muscle amino acids (AA), nitrogen balance, muscle protein catabolism (3-methylhistidine (3MH)) and synthesis (MPS, measured by SunSet method in EDL, Sol and tibialis (Tib)) and expression/activation of proteins involved in anabolism (4EBP1, S6K) and catabolism (MuRF1)). Statistics: ANOVA and Fisher's PLSD.

**Results:** The gain and rate of weight gain during refeeding were similar. Refeeding was associated with an increase in triglycerides ( $p < 0.05$ ) and, in NCP groups, in glycemia ( $p < 0.05$ ). Whatever the dose, NCP promoted muscle gain in Tib ( $p < 0.05$  vs MAL) but not in EDL or Sol and increased EDL protein content (ANOVA  $p = 0.07$ , NCP10 vs. DEN,  $p = 0.05$ ) with no effect on other muscles. Phosphorylation of 4EBP1 increased in the REN ( $p < 0.05$ ), NCP1 ( $p = 0.06$ ) and NCP10 groups ( $p < 0.05$ ) compared to the DEN group in the EDL and in REN vs NCP1 ( $p = 0.07$ ) in Tib. S6K1 increased in Tib (NCP vs REN,  $p = 0.007$ ) and EDL (+24% NCP vs REN and MAL, NS). However, the rate of MPS did

not differ. NCP decreased MuRF1 expression in Tib (NCP vs REN,  $p < 0.05$ ) but not in Sol and EDL. NCP did not alter plasma AA profile, nitrogen balance, plasma Phe/Tyr ratio, urinary excretion of 3MH, creatinine, and urea.

**Conclusions:** During refeeding, NCP supply may help to preserve lean mass. NCP effects are muscle-type dependent and appeared to be limited either by refeeding-associated insulin resistance or by the availability of AA for MPS.

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## OR22

### SHORT TERM EFFECT OF OMEGA FATTY ACIDS ON INTESTINAL SATIETY HORMONES AND c-FOS PROTEIN LEVELS IN HYPOTHALAMUS

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**Rationale:** A better understanding of the effect of dietary fats on food intake and satiety metabolism has an important role in combating obesity. In this study, we aimed to research the effects of omega fatty acids on plasma glucose levels, responses of some intestinal hormones related to satiety on short-term effects.

**Methods:** Sixty Sprague-Dawley female rats were used in the study. The rats were randomly divided into 6 groups and the groups were determined as baseline (BA), serum physiologic given group (SF), linoleic acid (LA),  $\alpha$ -linolenic acid (ALA), eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Except for the BA, SF and fatty acids were administered by oral gavage at a dose of 400 mg/kg and 1 mL of blood was taken at the end of 15 min, 30 min, 60 min and 120 min. At the end of the second hour, the rats were sacrificed by cardiac perfusion and brain tissues were removed. Plasma glucose levels were measured with a glucometer. Cholecystokinin, GLP-1 and peptide YY hormones were analyzed by ELISA. Activation of c-Fos protein in the hypothalamus was determined by immunohistochemical staining. Data were evaluated with SPSS 18.0 program and interpreted at 5% significance level.

**Results:** Cholecystokinin hormone levels increased in omega-3 groups in the first hour and decreased in LA. Compared with the linoleic acid group, the hormone levels of cholecystokinin, GLP-1 and peptide YY of omega-3 fatty acids were found to be significantly higher at 60 min and 120 min ( $p < 0.05$ ). The highest level in cholecystokinin and GLP-1 hormones was determined in the ALA group and in the peptide YY in the DHA group. When compared between groups, GLP-1 levels are significantly higher in ALA group than in LA group only in 15 minutes. No significant difference was found between the other groups in 30–120 min ( $p > 0.05$ ). When the neuron activities demonstrated by c-Fos expression in the hypothalamus at the end of two hours were compared, it was seen that the highest activation was in the EPA group.

**Conclusions:** Omega-3 fatty acids have been shown to be effective in short-term satiety. Evidences show that fats stimulate secretion of the gut peptides, which are reported to have satisfactory effects, but have a limited effect on long-term energy intake.

**Disclosure of Interest:** None declared.

**OR23****INSULIN RESISTANCE AND IMPAIRED LIVER GLYCOGEN SYNTHESIS ARE RESPONSIBLE FOR GLYCOMETABOLIC DISORDER IN TOTAL PARENTERAL NUTRITION**

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**Rationale:** Hyper- and hypoglycemia are common during total parenteral nutrition (TPN) support. Traditionally, glycometabolic disorder in TPN is thought to be caused by direct intravenous infusion of glucose, but there is a lack of study on the mechanism. We aimed to explore the mechanism underlying TPN related glycometabolic disorder.

**Methods:** 1) Patients with chronic intestinal failure (CIF) requiring long-term parenteral nutrition (PN) from August 2013 to August 2018 were included in clinical research. We assessed insulin resistance by using homeostatic model assessment for insulin resistance (HOMA-IR) weekly. The correlation between HOMA-IR and PN proportion, nosocomial complications, lean mass rate was analyzed in CIF patients. 2) We detected insulin sensitivity, hepatic insulin signaling pathway and liver glycogen deposition in TPN mouse model.

**Results:** In clinical research, 256 CIF patients were analyzed. The average PN calorie proportion was positively correlated with HOMA-IR value. Moreover, higher HOMA-IR was associated with nosocomial complications, including ICU transfer, liver injury, renal insufficiency, infection, pneumonia and fever (all  $P < 0.05$ ). HOMA-IR was the third significant independent risk factor after BMI and gender for protein mass rate, fat free mass rate and skeletal muscle mass rate (all  $P < 0.05$ ). Accordingly, in mice model, TPN induced systemic insulin resistance, blocked insulin-derived glycogen synthesis pathway and decreased glycogen deposition in liver compared to enteral feeding mice.

**Conclusions:** Insulin resistance and impaired liver glycogen deposition may accelerate and exacerbate the occurrence of hyper- and hypoglycemia, respectively. We added to the current knowledge about the mechanism of PN-related hyper- and hypoglycemia and recommended monitoring insulin resistance in CIF patients with long-term PN dependence.

**Disclosure of Interest:** None declared.

**OR24****EFFECT OF THE PRESENCE OF THE POLYMORPHISM OF BCAT2 RS11548193 ON PLASMA BRANCHED-CHAIN AMINO ACIDS CONCENTRATION AFTER A DIETARY INTERVENTION IN SUBJECTS WITH OBESITY AND INSULIN RESISTANCE**

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**Rationale:** Branched-chain amino acids (BCAAs) are referred as markers of insulin resistance (IR) in subjects with obesity. In this study, we assessed whether the presence of the single nucleotide polymorphism (SNP) of the branched-chain aminotransferase 2 (BCAT2), that has been previously associated with a decrease in

BCAAs concentration, can modify the effect of a dietary intervention (DI) on the plasma concentration of BCAAs in subject with obesity and IR.

**Methods:** A before and after study was performed in adult subjects with a BMI  $\geq 30$  kg/m<sup>2</sup>, IR (HOMA-IR  $\geq 2.5$ ) and no diagnosed chronic diseases. They were given a DI based on calorie restriction and nutritional education for a month. Anthropometric measurements, body composition, blood pressure, resting energy expenditure (REE), oral glucose tolerance test (OGTT), serum biochemical parameters, and plasma amino acid profile were evaluated, before and after DI. The presence of SNP was by TaqMan<sup>®</sup> SNP Genotyping Assay. Statistical analysis was performed by multivariate analysis to compare the effect of both groups (with and without SNP).

**Results:** Sixty subjects with obesity (BMI  $38.3 \pm 6.01$  Kg/m<sup>2</sup>) and IR (HOMA-IR  $6.13 \pm 2.37$ ) participated in the study. A weight loss of  $3.22 \pm 1.82$  kg was observed with the DI. SNP frequency corresponded to 20%. The DI decreased the area under curve of glucose and insulin. Interestingly, the effect of DI on BCAAs, glutamine and methionine concentration, as well as on fat mass, lean mass, systolic blood pressure, LDL cholesterol, liver function tests, REE and area under the curve during OGTT was modified by the presence of SNP on BCAT2.

**Conclusions:** The presence of the SNP of BCAT2 modifies the effect of DI on BCAAs concentration in subjects with obesity and IR.

**Disclosure of Interest:** L. González-Salazar: None declared, E. Pichardo-Ontiveros: None declared, A. Vigil-Martínez: None declared, O. Granados-Portillo: None declared, M. D. R. Guizar-Heredia: None declared, B. Palacios-González: None declared, L. Noriega: None declared, A. Flores-López: None declared, N. Torres: None declared, C. Castelan-Licona: None declared, P. Heredia G.-Cantón: None declared, G. Ordaz-Nava: None declared, J. Reyes-García: None declared, L. Arteaga-Sanchez: None declared, A. Avila-Nava: None declared, C. Zerrweck-López: None declared, A. Tovar: None declared, M. Guevara-Cruz Grant/Research Support from: CONACYT PN-2016/3324.

**OR25****DISTURBED BRANCHED-CHAIN AMINO ACID METABOLISM IN COPD WITH ABDOMINAL OBESITY IS MORE PRONOUNCED IN WOMEN BUT NOT ASSOCIATED WITH MORE IMPAIRED FUNCTIONAL PERFORMANCE**

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**Rationale:** Abdominal obesity is widely accepted as the most hazardous fat deposit in the body, with links to inflammation and disturbed branched-chain amino acids (BCAA) metabolism, and is becoming more prevalent in Chronic Obstructive Pulmonary Disease (COPD). It remains unclear if abdominal obesity produces different metabolic and functional phenotypes in COPD patients in a gender specific manner.

**Methods:** 27 COPD (GOLD II-IV) and 27 control subjects, all abdominally obese (AO) based on published cut offs for android/gynoid ratio, were studied. Body composition (Fat mass (FM), Fat-free mass (FFM) and visceral adipose tissue (VAT)) was measured by DEXA, and mood and cognition by questionnaires and assessments (stroop and trail making tests). Whole body rate of appearance (Ra) of leucine (LEU) and plasma BCAA concentration were assessed by pulse IV tracer infusion and LC-MS/MS. Statistics (SE;  $p < 0.05$ ) by two-way ANOVA.

**Results:** AO-COPD patients were characterized by higher VAT ( $1063 \pm 76$  vs  $834 \pm 50$  g,  $p < 0.01$ ) and FM/FFM ratio ( $0.67 \pm 0.04$  vs  $0.58 \pm 0.04$ ,  $p < 0.05$ ), lower cognitive performance ( $p < 0.05$ ), and higher depression and anxiety ( $p < 0.05$ ) than AO-controls.

Furthermore, cardiometabolic profile was impaired as reflected by higher plasma hs-CRP ( $6.5 \pm 1.6$  vs  $1.6 \pm 0.3$  mg/L,  $p < 0.01$ ) and glucose ( $5.97 \pm 0.20$  vs  $5.57 \pm 0.09$  mmol/L,  $p = 0.07$ ). Women had higher values for FM/FFM ( $p < 0.001$ ) than men due to higher FM ( $34.2 \pm 2.1$  vs  $28.8 \pm 1.8$  kg,  $p = 0.07$ ) and lower lean mass ( $60.2 \pm 1.4$  vs  $44.9 \pm 1.7$  kg,  $p < 0.001$ ) and daily protein intake ( $p < 0.05$ ). BCAA metabolism was more impaired in women (higher Ra LEU and lower plasma BCAA concentration ( $p < 0.01$ )), despite comparable lung function and BMI. Significant AO x gender interaction was found for Ra LEU with highest values in AO-COPD females ( $p < 0.05$ ). Although women tended to have less comorbidities ( $1.00 \pm 0.20$  vs  $1.23 \pm 0.38$ ,  $p = 0.07$ ), no gender effect was observed for mood and cognitive function, CRP or plasma glucose values.

**Conclusions:** BCAA metabolism is more disturbed in women with COPD and concomitant abdominal obesity but is not linked to reduced functional performance.

**Disclosure of Interest:** None declared.

#### OR26

##### OMEGA 3 FATTY ACID SUPPLEMENTATION ATTENUATES MUSCLE DISUSE ATROPHY DURING TWO WEEKS OF UNILATERAL LEG IMMOBILIZATION IN YOUNG WOMEN

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**Rationale:** Omega-3 fatty acid supplementation enhances rates of myofibrillar protein synthesis (MPS), muscle size, and ADP sensitivity in otherwise healthy adults. Whether omega-3 fatty acid supplementation attenuates human muscle disuse-atrophy and the associated decline in MPS, muscle size, and readouts of mitochondrial function remains unknown.

**Methods:** Twenty women (BMI =  $23.062.3$  kg/m<sup>2</sup>, age =  $22.6 \pm 3$  yr) underwent 2 wk of unilateral limb immobilization followed by 2 wk of return to normal physical activity. Commencing 4 wk prior to immobilization, participants consumed either 5 g/d of omega-3 fatty acids or an isoenergetic quantity of sunflower oil as a control. Muscle size and mass were measured pre-and post immobilization as well as after 2 wk of recovery. Serial skeletal muscle biopsies were obtained throughout the protocol to assess changes in integrated rates of MPS, mitochondrial function as well as alterations in myogenic gene and protein expression.

**Results:** Following immobilization, the decline in muscle volume was greater in the control group compared to the omega-3 fatty acid group (14 vs. 8%,  $P < 0.05$ ) and was not different from pre immobilization at recovery in the omega-3 fatty acid group; however, it was still lower in the control group ( $P < 0.05$ ). Muscle mass was reduced in the control group only ( $P < 0.05$ ). MPS was higher in the omega-3 group compared with the control group at all times ( $P < 0.05$ ). In response to immobilization, there was a significant reduction (~20%,  $P < 0.05$ ) in ADP-stimulation mitochondrial respiration in the control group but not the omega-3 group.

**Conclusions:** These data suggest that 4 wk of omega-3 fatty acid supplementation protects against muscle disuse-atrophy during 2 wk of unilateral leg immobilization in young women that could be mediated by the preservation of mitochondrial function, and attenuation of declines in rates of MPS.

**Disclosure of Interest:** None declared.

#### OR27

##### BARIATRIC SURGERY AFFECTS OBESITY-RELATED PROTEIN REQUIREMENTS

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**Rationale:** Following bariatric surgery, protein deficiency intakes are reported in morbidly obese patients, whereas post-bariatric protein requirements are not specifically defined with validated method in this population. The objective of the study was to assess average protein requirement (APR) in obese subjects, before, 3 months and 12 months after bariatric surgery using the validated method of nitrogen balance.

**Methods:** Prospective longitudinal study conducted in 21 morbidly obese patients (BMI  $43.9 \pm 1.4$  kg/m<sup>2</sup>) before (M0), 3 months (M3) and 12 months (M12) after sleeve gastrectomy or Roux-en-Y gastric bypass. An additional larger cross-sectional study was performed to validate APR before surgery in non-operated matched obese patients (n = 106). APR was evaluated at M0, M3, M12 by measuring 3 days dietary intakes together with losses of nitrogen in urine and stools. APR was defined as the mean value of protein intake required to achieve balance nitrogen equilibrium.

**Results:** Before surgery, APR in morbidly obese patients was 0.76 [95% CI, 0.66–0.92] g/kg Body Weight (BW)/d in the experimental group, and 0.74 [0.70–0.80] g/kg BW/d in the validation group. APR was 0.62 [0.51–0.75] g/kg/d at M3 and 0.87 [0.75–0.98] g/kg/d at M12, with no difference between surgical procedures. Spontaneous protein intakes were respectively  $0.80 \pm 0.05$ ,  $0.43 \pm 0.03$  and  $0.71 \pm 0.04$  g/kg BW/d respectively at M0, M3 and M12.

**Conclusions:** This study demonstrated a temporal change in protein requirement after bariatric surgery whatever the type of surgery. Spontaneous protein intakes following bariatric surgery did not cover protein requirements for most patients, suggesting that specific dietary protein recommendations have to be adapted in obese patients with bariatric surgery.

**Disclosure of Interest:** None declared.

### Oral Communication IV: Nutritional Assessment Intervention and Outcome I

#### OR28

##### INDIVIDUAL NUTRITIONAL INTERVENTION DURING 4 WEEKS FOR THE PREVENTION OF RE-ADMISSIONS AMONG GERIATRIC PATIENTS – RCT

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**Rationale:** Malnutrition is common in geriatric patients discharged from hospital, resulting in risk of decreased muscle strength,



functional capacity, quality of life and increased risk of re-/admission. Primary objective: To investigate if an individualized nutritional intervention in geriatric patients reduced re-/admission rate at 30 days. Secondary objectives: Re-/admission rate at 60 days, nutritional status (weight, energy- and protein intake), functional status (ADL), muscle strength (chair stand, handgrip strength) and quality of life.

**Methods:** 4 weeks RCT in Zealand University Hospital with 30/60 days follow-up. Geriatric patients (65+ years) randomized to hospital standard treatment (CG n = 19) or individualized nutritional intervention (IG n = 21) consisting of dietary counselling and a nutrition plan at discharge combined with 2 home visits. Statistical analysis: Non-parametric statistical tests, ITT for re-/admission and PP for secondary outcomes.

**Results:** 100% compliance to intervention. No significant differences between IG and IC in re-/admission rate at 30 days (29% vs 11%) and 60 days (29% vs 25%). 93% in the IG achieved their required energy intake compared to 47% in the CG ( $p = 0.014$ ). No other differences between IG and CG. Baseline to 30 days: In the IG an increased percentage achieved  $\geq 75\%$  of their required energy- (53% vs. 93%,  $p = 0.035$ ) and protein intake (20% vs 73%,  $p = 0.009$ ). Baseline to 60 days: In the IG median ADL increased (79 vs. 82,  $p = 0.016$ ) and in the CG handgrip strength increased (19 vs. 22 kg,  $p = 0.049$ ) and so did self-evaluated quality of life (60 vs. 75 VAS,  $p = 0.032$ ).

**Conclusions:** Four weeks individualized nutritional intervention at discharge did not reduce re-/admission in geriatric patients 30/60 days after discharge, despite an increased number of geriatric patients achieved their required energy intake at 30 days.

**Disclosure of Interest:** None declared.

## OR29

### COMPARISON OF THE 2010 AND 2018 DIAGNOSTIC CRITERIA FOR SARCOPENIA BY THE EUROPEAN WORKING GROUP ON SARCOPENIA IN OLDER PEOPLE (EWGSOP) IN SWEDISH ELDERLY

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**Rationale:** The updated diagnostic criteria for sarcopenia (EWGSOP2) focus less on performance. Therefore, it is of interest to compare the sarcopenia prevalence between the 2010 (EWGSOP1) and 2018 (EWGSOP2) criteria.

**Methods:** Two birth cohorts, 70 and 85 years old ( $n = 887$  and  $n = 156$ , respectively) were assessed (BMI  $26 \pm 4$ , 16.5–46.2 kg/m<sup>2</sup>, 57% women). Low grip strength (Martin Vigorimeter) and slow self-selected walking speed (30/10 m.) were defined as below  $-2.5$  SD from a young reference population (T-score) ( $\delta$  60,  $\phi$  69 kPa and  $\delta$  1.0,  $\phi$  0.9 m/s, respectively). Low muscle mass was defined as appendicular lean soft tissue index (DXA) T-score below  $-2$  ( $\delta$  7.0,  $\phi$  5.7 kg/m<sup>2</sup>). The EWGSOP1 and EWGSOP2 were applied and compared with Chi<sup>2</sup> and McNemar tests.

**Results:** Prevalence of low grip strength was 11 and 77% in the 70 and 85 year olds ( $p < 0.001$ ) and slow self-selected walking speed was found in 3 and 58%, respectively ( $p < 0.001$ ). Prevalence of low muscle mass was 18 and 67% in the 70 and 85 year cohorts ( $p < 0.001$ ). Sarcopenia prevalence was higher in the 85 compared to 70 year olds, both according to EWGSOP1 (60 and 4%) and EWGSOP2 (54 and 3%), with no difference between sexes (ns). Comparing the EWGSOP1 and 2, there was a significant difference in sarcopenia classification ( $p < 0.001$ ), stratified by cohort and sex there was a difference only in 85 year old women (7 out of 99 was discordant,  $p = 0.02$ ).

**Conclusions:** This study shows a clear increase in prevalence of sarcopenia between 70 and 85 years, irrespective of definition. Overall,

the differences between the EWGSOP1 and EWGSOP2 classifications are small. However, there may be clinically important differences in classification between the two criteria in populations with high sarcopenia prevalence, particularly in women.

**Disclosure of Interest:** None declared.

## OR30

### THE GERIATRIC NUTRITIONAL RISK INDEX PREDICTS OVERALL SURVIVAL IN GERIATRIC PATIENTS WITH METASTATIC LUNG ADENOCARCINOMA

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**Rationale:** Geriatric nutritional risk index (GNRI) is a simplified, objective screening assessment for nutrition risk in geriatric patients. However, the role of GNRI in predicting prognosis of geriatric patients with metastatic lung adenocarcinoma (MLA) has not been investigated. This study aimed to assess the prognostic value of the pretreatment GNRI in geriatric patients with MLA.

**Methods:** The clinicopathological characteristics of 144 consecutive geriatric patients with MLA between January 2011 and May 2017 were retrospectively analyzed to calculate GNRI. The pretreatment GNRI was calculated as follows:  $GNRI = 1.489 \times \text{pretreatment serum albumin concentration (g/L)} + 41.7 \times \text{pretreatment body weight (kg)/ideal body weight (kg)}$ ; ideal body weight (kg) =  $\text{Height (cm)} - 100 - [(\text{Height (cm)} - 150)/4]$  (for men) or  $\text{Height (cm)} - 100 - [(\text{Height (cm)} - 150)/2.5]$  (for women); when pretreatment body weight exceeded ideal body weight, pretreatment body weight/ideal body weight was set to 1. The receiver operating characteristic (ROC) curve was used to determine the best cutoff value of the GNRI for predicting overall survival (OS). The Kaplan–Meier method was used to estimate survival curves. Univariate and multivariate Cox regression were used to identify variables associated with OS in the whole cohort, the non-sensitizing epidermal growth factor receptor (EGFR) mutation subgroup (including EGFR wildtype and non-sensitizing mutations), and the sensitizing EGFR mutation subgroup.

**Results:** The best cutoff value of the GNRI was 97. The patients were divided into the malnutrition risk group (MNRG) ( $GNRI \leq 97$ ,  $N = 75$ ) and the normal nutrition group (NNG) ( $GNRI > 97$ ,  $N = 69$ ). Low GNRI values were significantly associated with older age ( $p = 0.002$ ), a high Eastern Cooperative Oncology Group (ECOG) ( $p = 0.037$ ), low body mass index (BMI) ( $p = 0.003$ ), low serum albumin concentrations ( $p < 0.001$ ), and a high neutrophil/lymphocyte ratio ( $p = 0.004$ ). In Kaplan–Meier analysis of OS, NNG had significantly longer OS compared to the MNRG (1-year OS, 85.6% vs. 54.7%,  $p < 0.001$ ) in the whole cohort. In non-sensitizing EGFR mutation subgroup ( $N = 84$ ), the normal nutrition patients had significantly longer OS compared to the malnutrition risk patients (1-year OS, 77.5% vs. 36.4%,  $p < 0.001$ ). In EGFR sensitizing mutation subgroup ( $N = 60$ ), there was no significant differences in OS between the NNG and MNRG patients (1-year OS, 96.6% vs. 80.6%,  $P = 0.099$ ). Low GNRI values ( $p = 0.019$ ), liver metastases ( $p < 0.001$ ), and EGFR mutation status ( $p < 0.001$ ) were independent prognostic factors of OS. Furthermore, low GNRI values ( $p = 0.025$ ), liver metastases ( $p < 0.001$ ), and ECOG score ( $p = 0.008$ ) were independent prognostic factors of OS in the non-sensitizing EGFR mutation subgroup, and sex ( $p = 0.007$ ) was an independent prognostic factor for OS in the sensitizing EGFR mutation subgroup.

**Conclusions:** This study firstly shows the importance of the pretreatment GNRI in predicting OS in geriatric patients with MLA, especially in patients not harboring sensitizing EGFR mutations.

**Disclosure of Interest:** None declared.

**OR31**  
**LOSS OF SUBCUTANEOUS ADIPOSE TISSUE DURING PALLIATIVE CHEMOTHERAPY PREDICTS REDUCED SURVIVAL IN PATIENTS WITH INCURABLE COLORECTAL CANCER**

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**Rationale:** Obesity is an established risk factor for colorectal cancer (CRC), however little is known about the impact on survival of changes in body composition during chemotherapy.

**Methods:** A prospective study of adult CRC patients undergoing chemotherapy between 2012 and 2016 was conducted. Baseline body composition and longitudinal changes were examined using computed tomography (CT) images at two timepoints (interval 7 months, IQR: 5–9 months) using paired t-tests. Sarcopenia and low muscle attenuation (MA) were defined using published cut-offs. Cox models were used to estimate mortality hazard ratios, adjusted for known prognostic covariates –age, sex, performance status & systemic inflammation.

**Results:** In total, 268 patients were recruited (66% male, mean age 63 years) and 51% were undergoing chemotherapy with a palliative intent. At baseline, 4% had BMI <20 kg/m<sup>2</sup> & 58% had BMI ≥ 25 kg/m<sup>2</sup>. However, 38%, 34% & 43% had cachexia, sarcopenia & low MA, respectively. Over 100 days, 68% were muscle stable (±1 kg), while 25% lost >1 kg and 7% gained >1 kg. Fat mass remained stable ±1 kg in 49%, while 28% lost >1 kg and 23% gained >1 kg. On multivariate analysis, baseline BMI and subcutaneous fat (SAT) loss predicted survival in patients treated with palliative intent. Normal BMI (20–25 kg/m<sup>2</sup>) predicted reduced survival compared to overweight (25–30 kg/m<sup>2</sup>) [HR:1.80 (95% CI:1.04–3.14), p=0.037]. Loss of >6.4% SAT over 100 days was predictive of poor survival versus gain/<6.4% loss, independent of changes in muscle mass [HR:2.2 (95% CI:1.07–4.62), p=0.033].

**Conclusions:** Patients with CRC experience significant losses in muscle and fat mass during chemotherapy. Loss of SAT mass during palliative chemotherapy is prognostic of poor survival, independent of changes in muscle mass. Baseline BMI in the overweight range confers a survival advantage. Nutritional strategies to prevent or attenuate weight loss during chemotherapy are advisable especially in the context of advanced CRC.

**Disclosure of Interest:** None declared.

**OR32**  
**POSTOPERATIVE SKELETAL MUSCLE LOSS NEGATIVELY IMPACT SURVIVAL OF COLORECTAL CANCER**

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**Rationale:** Loss of skeletal muscle is common in patients with surgically treated colorectal cancer and it may be associated with poor survival, but previous studies including ours mainly focused on the preoperative skeletal muscle loss. The aim of this study was therefore to evaluate the prognostic impact of postoperative skeletal muscle loss on survival in patients after surgery for colorectal cancer.

**Methods:** Three hundred and seventy-five consecutive patients who underwent surgery for colorectal cancer were prospectively included.

The changes in skeletal muscle index were calculated to assess postoperative skeletal muscle loss using computed tomography scan before and after cancer surgery. The survival data was recorded, and univariate and multivariate analyses were performed.

**Results:** The mean reduction in skeletal muscle index was more significant in patients with recurrence than in those without recurrence ( $P < 0.05$ ). Patients with a >12% reduction in skeletal muscle index showed poorer overall survival and disease-free survival than those without a <12% reduction in skeletal muscle index ( $P < 0.05$ ). On multivariate analysis, a >12% postoperative reduction in skeletal muscle index was identified as a risk factor of overall survival and disease-free survival ( $P < 0.05$ ).

**Conclusions:** Postoperative skeletal muscle loss negatively impacted survival in patients with colorectal cancer. Identification of postoperative skeletal muscle loss in surgery for colorectal cancer and targeted approaches may improve its negative survival.

**Disclosure of Interest:** None declared.

**OR33**  
**PRESERVATION OF LEAN MASS UPON COMBINED LIFESTYLE INTERVENTION IN OLDER ADULTS WITH OBESITY AND TYPE 2 DIABETES DURING 6-MONTHS FOLLOW-UP AFTER RCT (PROBE STUDY)**

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**Rationale:** Weight loss is a key element in the treatment of obesity and type 2 diabetes (T2D), but also a risk factor for lean mass (LM) loss in older adults. We evaluated whether a whey protein drink enriched with leucine and vitamin D preserved LM during 3-month lifestyle intervention and whether effects sustained during 6 months follow-up after intervention (FU).

**Methods:** 123 older adults (66 ± 6 y) with obesity (BMI 34 ± 4 kg/m<sup>2</sup>) and T2D participated in a 3-month lifestyle intervention with dietary advice (–600 kcal/d) and resistance exercise (3x/wk). In this double-blind RCT (PROBE) subjects were randomised to receive 10x/wk a test (21 g protein) or isocaloric control (0 g protein) drink. LM, appendicular muscle mass (AMM), leg muscle mass (LMM), and fat mass (FM) were assessed with DXA. Mixed linear model analysis was used with baseline value in the outcome vector and adjustment for stratification factors sex and SU-derivate use. Data represent EMM±SE (within group) or 95% CI (between groups).

**Results:** 105 subjects completed intervention and 76 subjects participated in FU. At 3 months, body weight (–2.2 ± 0.4 kg,  $p < 0.001$ , for test; –2.9 ± 0.4 kg,  $p < 0.001$ , for control) and FM (–2.6 ± 0.4 kg,  $p < 0.001$ , for test; –2.5 ± 0.4 kg,  $p < 0.001$ , for control) were reduced without differences between groups. LM and AMM were increased in test (+0.57 ± 0.27 kg,  $p = 0.03$ ; +0.39 ± 0.13,  $p < 0.01$ ) and unchanged in control (–0.35 ± 0.26 kg,  $p = 0.18$ ; +0.03 ± 0.12 kg,  $p = 0.80$ ), with significant difference between groups (+0.92 kg, 95%CI 0.19–1.65,  $p = 0.015$ ; +0.36 kg, 95%CI 0.01–0.71,  $p = 0.047$ ). At FU (without test or control drink), the difference in LM and AMM between groups had disappeared while both groups still had significantly improved body composition compared to baseline, as reflected by decreased FM and increased or preserved LM and AMM (see table).



FU compared to baseline	Test EMM±SE; p	Control EMM±SE; p	Test vs. Control EMM; 95%CI
FM	-2.4 ± 0.4 kg; <0.001	-2.6 ± 0.4 kg; <0.001	+0.24; -0.94–1.41
LM	+0.88 ± 0.32 kg; 0.007	+0.54 ± 0.32 kg; 0.09	+0.34; -0.56–1.24
AMM	+0.46 ± 0.15 kg; 0.002	+0.31 ± 0.15 kg; 0.03	+0.15; -0.26–0.56

**Conclusions:** Use of a whey protein drink enriched with leucine and vitamin D during a combined lifestyle intervention showed beneficial effects on lean mass in older adults with obesity and type 2 diabetes. Preservation of lean mass was sustained after 6 months follow-up, without differences between treatment groups.

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### OR34

#### EFFECTS OF PROBIOTICS AND SYMBIOTIC ON LIPID PROFILES IN ADULTS AT RISK OF TYPE 2 DIABETES: A DOUBLE-BLIND RANDOMIZED CONTROLLED CLINICAL TRIAL

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**Rationale & Background:** The use of probiotics and/or prebiotics as the effective means of regulating gut microbiota may have a beneficial effect on metabolic disorders.

**Aims:** This study was designed to assess the ability of probiotics and synbiotic to modify lipid profiles in subjects with prediabetes who are at risk of diabetes and cardiovascular diseases.

**Methods:** In a randomized double-blind placebo-controlled clinical trial, 120 prediabetic adults aged 35–70 years from the first degree family of type 2 diabetic patients were recruited and randomly equally assigned to consume 6 g/d either probiotics or synbiotic or placebo supplements for 6 months. Food record, physical activity, anthropometric measures, and lipid profiles were assessed repeatedly at baseline, and 3 and 6-month supplementation.

**Results:** Demographic and anthropometric measures, dietary intakes and physical activity were comparable at the baseline between the three groups and remained unchanged during the study. Probiotics and synbiotic were significantly effective in reduction of serum triglycerides after 6 months of intervention (SMD = -10.6 and -9.4 respectively). Compared with the placebo, synbiotic resulted in a significant reduction in serum triglyceride levels (mean±SE: -9.4 ± 6.6 mg/dl vs. +13.2 ± 6.8 mg/dl, p = 0.02). Serum total-, LDL-, and HDL-cholesterol were unaffected by probiotic or synbiotic.

**Conclusions:** The results of this study demonstrated that supplementation with probiotic and especially synbiotic could decrease the concentration of triglyceride in prediabetic adults. This finding could warrant future studies to determine the therapeutic and preventive effects of these supplements in individuals at risk of diabetes and cardiovascular diseases.

**Disclosure of Interest:** None declared.

### OR35

#### AUTOMATED BODY COMPOSITION ANALYSIS OF COMPUTED TOMOGRAPHY SCANS USING NEURAL NETWORKS

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**Rationale:** The quantity and quality of skeletal muscle and adipose tissue is associated with clinical outcomes across several illnesses. Computed tomography (CT) scans can be retrospectively analyzed for body composition, but manual analysis is laborious and costly. An open-source automated analysis framework would enable high-throughput quantification of body composition for clinical research.

**Methods:** CT scans at the 3rd lumbar vertebrae from critically ill and clear cell renal cell carcinoma patients, as well as renal and liver donors, were retrospectively analyzed for body composition. These scans were then used to train a neural network for the automated segmentation of skeletal muscle, intermuscular adipose tissue (IMAT), visceral adipose tissue (VAT), and subcutaneous adipose tissue (SAT). Network accuracy was evaluated using the Dice similarity coefficient (DSC), which quantifies the overlap between human and network-predicted segmentation maps (0 = no overlap, 1 = perfect overlap). The network was developed using 90% of the scans (80% training and 10% validation), with the remaining 10% used for testing network performance.

**Results:** Analysis included 708 patients (44% female; 300 critically ill, 155 clear cell renal cell carcinoma, and 253 donors) who were (mean±standard deviation) 52.0 ± 16.6 years old and had a body mass index of 28.3 ± 6.1 kg/m<sup>2</sup>. In the testing cohort (n = 72), DSC scores indicated excellent agreement between human and network-predicted segmentations for skeletal muscle (0.978 ± 0.032), IMAT (0.923 ± 0.032), VAT (0.974 ± 0.043), and SAT (0.986 ± 0.033). Network segmentation took approximately 25 seconds (n = 72) using modern computing hardware versus up to 18 hours of human analysis (15 minutes/scan).

**Conclusions:** Our network displayed excellent segmentation accuracy and speed across a wide range of body composition phenotypes and clinical cohorts, which may aid larger-scale exploration of the complex relationships between body composition and clinical outcomes.

**Disclosure of Interest:** None declared.

### OR36

#### THE ANALYSIS OF MYOSTEATOSIS FROM COMPUTED TOMOGRAPHY IMAGES – WHICH SKELETAL MUSCLE GROUP?

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**Rationale:** Attenuated skeletal muscle Hounsfield Unit (HU) radio-density which can be measured on computed tomography (CT) imaging at the third lumbar vertebral (L3) level, is associated with increased systemic inflammation and adverse clinical outcomes in patients with a number of types of cancer. The validated technique for the measurement of skeletal muscle density uses the combined density of all skeletal muscle groups at L3. However, there is increasing interest in the use of psoas muscle HU density at the same level. This technique has not been thoroughly investigated as a potential surrogate for muscle density when compared with the gold standard.

**Methods:** A total of 150 Portovenous phase CT images at the L3 level were retrospectively identified in patients who had non-emergency scans at a single institution and analysed by a single trained assessor using SliceOmatic software v5.0 (TomoVision, Canada). Manual segmentation based upon validated HU thresholds for skeletal muscle density was performed of all skeletal muscle at the L3 level, as well as the psoas, paravertebral and anterior abdominal wall skeletal muscle. The software then automatically calculates the mean HU density of each muscle group and all were compared with the gold standard which is whole L3 skeletal muscle density. The presence of myosteatosis was calculated from a previously validated definition.

**Results:** The paravertebral muscle group mean HU density was closest to the validated measure of whole L3 slice skeletal muscle HU density ( $34.5 \pm 10.8$  HU versus  $32.3 \pm 9.5$  HU,  $p < 0.0001$ ). The mean  $\pm$ SD density of the psoas muscle ( $42 \pm 8.4$  HU) was significantly higher than that of the whole slice skeletal muscle ( $p < 0.0001$ ). Anterior abdominal wall skeletal muscle HU density was significantly lower than that of the whole L3 slice ( $27.1 \pm 9.9$  HU versus  $32.3 \pm 9.5$  HU,  $p < 0.0001$ ). There was a significant difference in the prevalence of myosteatosis when the density measured from the psoas and whole L3 skeletal muscle were compared (28.5% vs. 63.1%,  $p < 0.0001$ ).

**Conclusions:** Psoas skeletal muscle HU density was significantly greater than whole L3 slice density and is likely to underestimate the true prevalence of myosteatosis, making this an unreliable sentinel for the gold standard analysis of whole skeletal muscle density at L3. Paravertebral HU radiodensity is likely to represent a better sentinel for whole slice values, however given the simplicity of the already validated technique we would advocate that this remains the gold standard.

**Disclosure of Interest:** None declared.

## ESPEN Best Abstracts 2019 & ESPEN Travel Awards

### OR37

#### PSOAS VERSUS WHOLE L3 SKELETAL MUSCLE CROSS-SECTIONAL AREA: HOW DO THEY RELATE?

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**Rationale:** Assessment of skeletal muscle cross-sectional area using computed tomography (CT) has been used to evaluate the presence of sarcopenia in patients with a variety of different cancer types. Studies have established a link between sarcopenia, and particularly sarcopenia in combination with being overweight or obese and negative treatment outcomes and overall survival. The validated methodology for this analysis utilises whole skeletal muscle cross-sectional area (CSA) at the third lumbar vertebral level (L3). However, an increasing body of evidence has focused upon CSA of the psoas muscle alone at the L3 level as a surrogate for whole slice area, a technique which has not been validated. The aim of this study was to investigate the validity of using the psoas muscle as a sentinel for calculated CSA at the L3 level.

**Methods:** A total of 150 CT scan images in portovenous phase at L3 were retrospectively identified retrospectively in patients who underwent non-emergency scans at Nottingham University Hospitals NHS Trust and were analysed by a single trained assessor using SliceOmatic software v5.0 (TomoVision, Canada). Cross-sectional area (CSA) was calculated for psoas, paravertebral and anterior abdominal wall skeletal muscle groups and compared with values for the whole L3 skeletal muscle CSA, representing the gold standard.

**Results:** When compared with whole L3 skeletal muscle CSA, anterior abdominal wall CSA had the strongest correlation ( $r = 0.9315$ ,  $p < 0.0001$ ) followed by paravertebral ( $r = 0.9508$ ,  $p < 0.0001$ ), with psoas muscle CSA having the lowest correlation, although this remained statistically significant ( $r = 0.7041$ ,  $p < 0.0001$ ). CSA was maximal for paravertebral muscles and least for psoas muscles, with abdominal wall muscles being inbetween.

**Conclusions:** Whole L3 skeletal muscle CSA correlated positively with psoas muscle CSA, although the correlation was stronger for both anterior abdominal wall and paravertebral muscle groups. Given the simplicity of the gold standard for measurement of muscle CSA and the validated thresholds for the diagnosis of sarcopenia, we recommend that whole L3 skeletal muscle rather than individual muscle CSA should remain the gold standard for this method of body composition analysis.

**Disclosure of Interest:** None declared.

### OR38

#### NUTRITION-RELATED FACTORS ASSOCIATED WITH LENGTH OF HOSPITAL STAY FOLLOWING NUTRITIONDAY

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**Rationale:** Length of stay (LOS) is often used to assess hospital nutrition care outcomes. This study examines the continuum of nutrition-related hospital care and its association with LOS in the general hospitalized population, accounting for commonly known determinants of LOS. The objective was to identify nutrition-related determinants of LOS from nutritionDay in the general hospitalized population.

**Methods:** The analysis was based on the 10 year cross-sectional multinational nutritionDay dataset ( $n = 155,524$ ). Fine and Gray competing risk model was used to examine LOS factors from nutritionDay to 30-day follow-up for three outcomes: discharge, transfer, and in-hospital mortality. Variables included known determinants of LOS and nutrition care factors relevant during a patient's hospital stay.

**Results:** The main analysis focuses on 104,540 patients of which 76,524 were discharged home within 30 days after nutrition Day. The median LOS before nutritionDay was 5 (IQR 2–11) and after nutritionDay 5 (IQR 2–10) for patients with the outcome discharged home. Nutrition-related factors associated with longer LOS [sub-distribution hazard (sH)  $< 1$ ] and shorter LOS (sH  $> 1$ ) from nutritionDay in these patients were: parenteral therapy (sH 0.88; 95%CI 0.84–0.94), enteral therapy (0.72; 0.69–0.76), both enteral and parenteral therapy (0.69; 0.62–0.76), ONS (0.87; 0.84–0.90), BMI [ei. underweight (0.89; 0.86–0.92) and overweight (1.04; 1.03–1.06) vs. normal], not having eaten all of the main meal [ei. only having eaten a quarter of the meal (0.89; 0.87–0.91) vs. eating the whole meal]. Other, non-nutrition factors were also relevant: mobility, age, sex, being in a region with lack of secondary care or cultural tendency towards hospital being the main care institution, being over the age of 70, being in the geriatric department or psychiatry department, infection, and brain, lung, bone, blood, liver, or skin as affected organs. Factors associated with longer and shorter LOS for patients who died in the hospital or were transferred will also be presented.

**Conclusions:** This study confirms the role of known determinants of LOS, but also found nutrition-related factors which have an association: the type of nutrition therapy, the amount of food eaten on nutritionDay, having lost weight, and not having a dietician.

**Disclosure of Interest:** None declared.

## OR39

## GASTRIC BYPASS DECREASES POSTPRANDIAL EXOGENOUS AND ENDOGENOUS TRIGLYCERIDE RESPONSES

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**Rationale:** Obesity is associated with increased postprandial triglyceride (TG) concentration, which is reverted to normal after gastric bypass (GB). Decreased intestinal chylomicron secretion and/or increased clearance from the blood may be involved.

**Methods:** Seven GB patients (GB: 2M/5F, mean BMI 30 ± 2 kg/m<sup>2</sup>), 6 overweight non operated subjects (OW: 1M/5F, mean BMI 31 ± 3 kg/m<sup>2</sup>) and 8 normal weight healthy subjects ((NW: 4M/4F, mean BMI 22 ± 1 kg/m<sup>2</sup>) were studied over 7 hours after ingestion of a liquid meal containing 18 g fat labelled with 250 mg <sup>13</sup>C<sub>6</sub> palmitate, 22 g protein, 36 g fructose and 36 g glucose. Chylomicrons TG (chylol-TG) and <sup>13</sup>C palmitate (chylol-<sup>13</sup>Cpalm) concentrations were measured hourly in Sf>400 lipoprotein sub-fractions. Exogenous-(chylol-TGexo) and endogenous-(chylol-TGendo) TG in chylomicrons were calculated from chylol-TG and meal <sup>13</sup>C palmitate enrichments. Incremental areas under the curve 0–420 min (iAUC) were compared with ANOVA and Bonferroni's correction.

**Results:**

Mean (SEM)	GB	OW	NW
iAUC chylol-TG (mmol/l*7 h)	8.9 (11.5)*	96.5 (23.1)#	28.8 (11.8)
iAUC chylol- <sup>13</sup> Cpalm (umol/l*7 h)	133 (28)*§	341 (37)	314 (78)
iAUC chylol- <sup>13</sup> C TGexo (mmol/l*7 h)	6.0(1.4)*	16.3(1.5)	14.7(3.7)
iAUC chylol-TGendo (mmol/l*7 h)	0.6(11.2)*	80.3(23.6)#	14.1(10.3)

**Conclusions:** Exogenous, <sup>13</sup>C-labelled lipids kinetics was not different in NW and OW. In OW, however, postprandial TG were increased due to unlabeled, endogenous TG, suggesting increased secretion of pre-stored TG from enterocytes and/or hepatic secretion of low density VLDLTG in OW. Compared to OW, GB patients had 1) markedly reduced chylol-<sup>13</sup>C TG exo and <sup>13</sup>Cpalm but no sign of severe fat malabsorption, suggesting that their postprandial exogenous TG clearance was increased; 2) lower postprandial endogenous TG responses indicating that their secretion of pre-stored TG from enterocytes or from the liver was normalized independently of body weight.

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## OR40

## GUT BACTERIAL CLPB GENE FUNCTION IS ASSOCIATED WITH DIETARY FIBER INTAKE AND DECREASED BODY WEIGHT

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**Rationale:** Growing evidence sustains the role of the microbiota-gut-brain axis in the pathophysiology of obesity. The chaperone ClpB, a gut bacterial protein, identified as a conformational antigen mimetic of  $\alpha$ -melanocyte-stimulating hormone, has been implicated in body-weight regulation in mice studies. Here we investigated the associations of ClpB with body mass index, dietary pattern and gut microbiota composition in humans.

**Methods:** Cross-sectional case-control study which included 113 subjects (64 with obesity), aged 27.2–66.6 years. Body composition was assessed by dual energy x-ray absorptiometry. Dietary pattern was collected in a personal interview using a validated food-frequency questionnaire. Metagenomic and metabolomic analyses were carried out by shotgun sequencing and mass spectrometry-based techniques (ultra-high pressure liquid chromatography (UHPLC)), respectively. Mice experiment: 22 mice were orally gavaged with fecal material from healthy volunteers previous treatment with a cocktail of antibiotics. Mice were weighted every week during 6 weeks. Statistical analysis:  $\chi^2$ , Student's t-test and Mann-Whitney U test were used to determine differences between groups, correlations were performed by Spearman analyses using MetaboAnalyst<sup>®</sup>.

**Results:** The bacterial ClpB was linked to a common gut microbiota ecosystem and metabolites (plasma hippuric acid), increased with the energy-adjusted fiber intake ( $r=0.294$ , FDR=0.009), and decreased with the body mass index ( $r=-0.283$ , FDR=0.006). The relative abundance of several phyla and families directly associated with ClpB was decreased in subjects with obesity. Furthermore, mice which received microbiota from donors with high ClpB expression gained less weight than those which received microbiota from donor with low ClpB detection.

**Conclusions:** The present study suggest that the intake of dietary fiber is associated with a bacterial ecosystem enriched in ClpB bacterial function, that could lead to increased satiety and decreased fat mass in long-term.

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#### OR41 SERUM MAGNESIUM DEFICIENCIES IN PATIENTS WITH INTESTINAL FAILURE: PERIOD PREVALENCE AND RISK FACTORS FOR OCCURRENCE

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**Rationale:** Magnesium deficiency is a common finding in intestinal failure (IF) patients. A clinical prediction rule to identify patients at risk for low plasma magnesium may result in early treatment and prevention of complications and hospital admissions.

**Methods:** We conducted a diagnostic retrospective cohort study. Patients treated between September 2015 until February 2018 were included. Primary outcome was the occurrence of a plasma magnesium level below 0.75 mmol/L, or being dependent on magnesium supplementation for more than one month. The following predictors were studied: presence of jejunostomy, jejunocolonic anastomosis, jejunoleo-colonic anastomosis and preservation of the ileocecal junction, proton pump inhibitor (PPI) use, time after last abdominal surgery, stoma or fistula output, administration of magnesium in standard parenteral nutrition (PN) in mmol/week, daily mean of the total volume fluids infused per week in ml, daily mean of the total kcal infused per week in kcal/kg body weight, use of alcohol and use of diuretics. Reliable data on stoma and fistula output were missing in 27% and 42% respectively, alcohol intake and use of diuretics were also excluded from analysis. Administration of magnesium in standard PN and daily mean of the total volume fluids infused per week were excluded because of high correlation. A multivariable logistic regression analysis was used to estimate regression coefficients. For updating the model the predictors age and short bowel pathophysiology were examined by calculating net reclassification.

**Results:** 213 patients were analysed (41% men, median age 61(48–70) years). 113(53%) patients were classified as hypomagnesaemia cases. 20% of all patients had a jejunostomy, 15% a jejunocolonic anastomosis (21% cases vs 7% non-cases, p.002) and 11(6%) patients had a jejunoleo-colonic-anastomosis. 67% used a PPI. 133 patients used intravenous administration of fluids and/or PN (76% in non-cases vs 50% in cases, p < 0.001). More cases had a short bowel (49% vs 23% in non-cases p < 0.001). Four prespecified predictors were included in the model. The model discriminated with an AUC of 0.76 (95% CI;0.70–0.83). Adding age and the presence of a short bowel resulted in a 0.53 re-classification (95% CI;0.27–0.79, p < 0.001).

**Conclusions:** Low plasma magnesium or the need for magnesium supplementation was present in 53% of the IF patients. Only daily mean of the total kcal infused per week in kcal/kg body weight, age and the presence of a short bowel remained significant predictors for hypomagnesaemia.

**Disclosure of Interest:** None declared.

#### Oral Communication V : Nutritional Assessment Intervention and Outcome II

#### OR42 VALIDITY OF BIOIMPEDANCE EQUATIONS TO EVALUATE BODY COMPOSITION IN PATIENTS WITH SEVERE ANOREXIA NERVOSA

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**Rationale:** Bioimpedanceometry (BIA) is a simple and rapid technique to measure body composition. However, validity of BIA in patients with low BMI remains controversial. Thus, we aimed to evaluate the validity of several BIA equations in patients with severe anorexia nervosa (AN) by using dual X ray absorptiometry (DXA) as reference.

**Methods:** Eight BIA equations (Deuremberg et al, Kyle et al, Sun et al, Bedogni et al, Roubenoff et al, Scalfi-1 et al, Scalfi-2 et al, Kushner et al) have been retrospectively applied on electrical data measured by BIA in AN patients with BMI < 16 kg/m<sup>2</sup>. BIA (Bodystat Quadscan 4000) and DXA (Lunar Prodigy Advance) were done the same day after an overnight fasting. Results were compared with Bland-Altman method, Pearson correlation and Lin concordance test.

**Results:** Data from 115 AN patients (32.3 ± 14.5 y; 14.6 ± 1.2 kg.m<sup>-2</sup>) were included. Fat mass and fat-free mass assessed by DXA were, respectively, 4.2 ± 2.4 kg and 35.4 ± 3.8 kg. The best results were obtained with Sun's Equation: respectively for FM and FFM, Bland Altman bias at 0.548 and 0.706 kg, Pearson correlation r at 0.86 and 0.86 and Lin concordance coefficient at 0.81 and 0.84. However, 95% confidence intervals (CI 95%) were high (from -2.73 to 3.83 kg for FM; from -4.55 to 3.13 kg for FFM). Other equations also showed high CI 95% (Table 1).

**Conclusions:** In severe AN patients with BMI < 16 kg/m<sup>2</sup>, all tested BIA equations are not adapted to evaluate body composition at the individual level.

**Disclosure of Interest:** None declared.

#### OR43 CREATININE TO CYSTATIN C RATIO AND BIA FOR THE ASSESSEMENT OF LOW LEAN BODY MASS IN CANCER PATIENT: COMPARAISON TO L3 CT-SCAN

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**Rationale:** Lean body mass (LBM) is an important prognosis factor in cancer patients. Although the L3 CT-scan is the most widely used method for the assessment of their body composition, it has some limitations particularly in terms of longitudinal follow-up. As the accuracy of BIA is discussed by some, the plasma creatinine-to-cystatin

**Table 1** (abstract: OR42).

(kg)	Deuremberg	Kyle	Bedogni	Roubenoff	Scalfi-1	Scalfi-2	Kushner
CI 95% FFM	-2.589/6.831	-2.447/5.534	-5.972/6.671	-2.069/5.918	-1.394/7.633	-6.594/5.547	-7.032/1.608
Bias FFM	2.121	1.543	0.349	1.925	3.119	-0.523	-2.712
CI 95% FM	-6.511/1.954	-5.189/1.787	-6.596/5.582	-5.611/1.446	-7.141/0.587	-5.522/6.254	-1.367/6.476
Bias FM	-2.278	-1.701	-0.507	-2.082	-3.277	0.366	2.555

**Table** (abstract: OR43).

	Men				Women			
	AUC	Threshold	Sensitivity	Specificity	AUC	Threshold	Sensitivity	Specificity
BIA	0.715	19.0 kg/m <sup>2</sup>	75%	67%	0.646	15.8 kg/m <sup>2</sup>	38%	100%
CCR	0.750	95.0 µmol/g	96%	50%	0.604	65.3 µmol/g	37.5%	100%

ratio (CCR) could be an attractive alternative: while both cystatin C and creatinine are markers of renal function, cystatin C is independent of muscle mass unlike creatinine. The aim of this study was to evaluate the CCR and BIA for the measurement of muscle mass and their ability to detect low muscularity in cancer patients compared to the CT-scan use as a standard.

**Methods:** Patients with any kind of cancer who had a L3 CT-scan 6 weeks or less before inclusion were recruited during their one-day multidisciplinary evaluation. Skeletal muscle area (SMA) on L3 CT-scan was measured on 2 consecutive slices with ImageJ software for the calculation of LBM ( $0.3 \times \text{SMA} + 6.06$ ).<sup>1</sup> Skeletal muscle index (SMA/height<sup>2</sup>, cm<sup>2</sup>/m<sup>2</sup>) thresholds for low muscularity on CT-scan were 55.4 for men and 38.4 for women<sup>1</sup>. Multifrequency BIA was performed following the manufacturer instructions with the patient fasted and lying on his back. Fasting blood samples were used for creatinine and cystatin C levels determination. Correlation tests and Bland-Altman concordance analysis were carried out and ROC curve analysis were done to assess the capacity of BIA and CCR to detect low muscularity.

**Results:** 30 men and 14 women were included. Among the 17 primary localization of cancer, lung, bladder and prostate accounted for 54% of cases. 84% of patients had metastatic disease. Both BIA and CCR were well correlated with CT-scan ( $r = 0.763$  and  $0.648$  respectively) but concordance analysis revealed a +3 kg constant bias towards BIA compared to CT-scan. Results for ROC curve analysis are presented in the table:

**Conclusions:** This study shows that LBM assessed by the CCR or BIA is well correlated with that determined by L3 CT-scan. The CCR capacity to detect low muscularity is similar to that of BIA. For the first time, we show that CCR, without further dedicated apparatus, can be used in cancer patient as a very convenient biomarker of muscularity.

#### Reference

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**Disclosure of Interest:** None declared.

#### OR44

##### THE SELF-EVALUATION OF FOOD INTAKE (SEFI®) AS A SCREENING TEST FOR MALNUTRITION IN GENERAL PRACTICE: PROSPECTIVE NON-INTERVENTIONAL MULTICENTER STUDY

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**Rationale:** Malnutrition prevalence is 35% at hospital, 30% in nursing homes and 5% in outpatients. Its diagnosis is often delayed. SEFI® is a quick and simple tool of assessment of food intake, and consists in a visual analogue scale (0 to 10), or evaluation of consumed portions. It allows the early identification of malnutrition risk when the score is <7/10 (1). In nursing homes, SEFI® detects malnutrition if the portions consumed are ≤50% of the main course (2). Main objective: to evaluate the reliability of SEFI® for the detection of malnutrition in adults in general practice. Secondary objectives: to assess the feasibility of SEFI® and the risk factors for malnutrition.

**Methods:** Non-interventional prospective 3 month study in consecutive patients seen in general practice in two French practices. Inclusion

criteria: adult consulting in general medicine to the principal investigator, not opposed to participating in the study. Exclusion criteria: pregnancy, diuretics, surgery for obesity, cognitive disorders, impossibility to weigh or collect information. Primary endpoint: SEFI® <7/10 compared to the presence of malnutrition defined by: weight loss in 6 months ≥10% and/or 1 month ≥5% and/or body mass index (BMI) ≤18.5 or <21 if ≥70 years of age. Secondary endpoint: proportion of patients for whom a SEFI® score was collected. Multivariate analysis: threshold  $\alpha = 0.20$  during univariate analyzes, step by step logistic regression.

**Results:** Among 747 patients meeting the inclusion criteria, 505 patients were included: mean age ( $\pm$ SD),  $56 \pm 19$  years, 23% ≥70 years, 61% women, 31% living alone, 49% consulting for acute medical problems and 37% for refilling prescriptions. 80 patients had SEFI® <7/10 (15.8%) and 32 patients (6.3%) were malnourished. The sensitivity of the SEFI® <7 for the diagnosis of malnutrition was 34.4% (95% confidence interval (CI) 17.9–50.8), the specificity of 85.4% (82.2–88.6), the positive predictive value of 13.4% (7.7–19.2), and the negative predictive value of 96.2% (93.7–97.7). SEFI® was feasible in all patients. In multivariate analysis, the risk factors for malnutrition were: age 45 to 70 years (odds ratio, 0.34 [95% CI, 0.13, 0.87]), female gender (4.72 [1.63; 13.66]), cancer (5.66 [1.58, 20.29]), and chronic alcoholism (8.60 [1.46, 50.81]),  $P < 0.05$ .

**Conclusions:** The high specificity and NPV, as well as the feasibility of the test, makes it a reliable tool for screening for malnutrition in general practice. A negative score could in particular rule out the diagnosis of undernutrition by the general practitioner in situations where recent weight loss or BMI are indeterminate.

#### References

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**Disclosure of Interest:** G. Bouëtté: None declared, M. Esvan: None declared, K. Apel: None declared, R. Thibault Other: Ronan Thibault is the designer of the SEFI.

#### OR45

##### 5-YEAR MORTALITY OF 384 SEVERELY MALNOURISHED ANOREXIA NERVOSA (AN) ADULT PATIENTS AFTER ADMISSION IN A CLINICAL-NUTRITION-UNIT

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**Rationale:** AN is associated with the highest mortality rate of any psychiatric disorder. The clinical-nutrition-unit in Raymond Poincaré University hospital is specialized in the management of severe undernutrition and its somatic complications in AN patients. Intensive medical care is provided to stabilize the patients prior Eating Disorders Programs in psychiatric unit. We aimed in this study to estimate Standardized Mortality Ratio (SMR) and to investigate potential predictive factors of mortality among this specific population

to improve detection and management of AN patients most at risk of death.

**Methods:** All adult AN patients (DSM IV criteria), admitted for the first time in the unit of Raymond Poincaré hospital between November 1997 and January 2014 were included. For each patient, socio-demographic, anamnesis and clinical data were collected from the patient's medical record. Patient vital status was provided by the French National Death Register. Univariate and multivariate Cox regression analysis were performed to identify mortality predictors.

**Results:** Vital status was determined for 384 patients (21 male and 363 female). At admission: mean age was 29.4 years (SD = 12), mean BMI was 12.7 kg/m<sup>2</sup> (SD = 2.2), mean AN duration was 9.8 years (SD = 9.3). 301 patients (78%) had previously been hospitalized in other hospitals for AN before their first admission in Raymond Poincaré hospital. 44 deaths were reported over an average post in-patient treatment follow-up of 5.7 years. Crude mortality rate was 11.5%. Standardized mortality ratio was 15.92 [CI 95% (11.56–21.37)].

Predictors factors of mortality were: having at least one child, history of discharge against medical advice, diuretic use, and cardiovascular and/or endocrine comorbidities. During the hospitalization in the unit, predictors of mortality were compulsory treatment, MICU transfer, hematologic complications (anemia with hemoglobin level < 9 g/dl and/ or thrombopenia), dysnatremia.

**Conclusions:** In a population of severely malnourished AN adult patients, hospitalized in medicine unit because of somatic severity, the mortality is higher than the mortality of patients with a less severe somatic status hospitalized in psychiatric unit. This study highlights new somatic predictive factors of mortality. It brings new insights to help in recognizing and managing patients at risk of death.

**Disclosure of Interest:** None declared.

#### OR46

##### HANDGRIP STRENGTH AND DIETARY INTAKE IN AN ELDERLY POPULATION: RESULTS FROM THE ISRAELI NATIONAL HEALTH AND NUTRITION SURVEY, 2014–16

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**Rationale:** Hand Grip Strength (HGS) is a means to assess muscle strength, which is one of the most decisive indicators of health status in older adults. This study evaluated the association between HGS and dietary intake in free-living older adults using a large-scale nationally representative dataset.

**Methods:** Data for this research was taken from the 2014–2016 Israeli Health and Nutrition Survey carried out in the elderly population. The cross-sectional survey included 1029 adults, ≥65 years of age (44% male). Trained personnel performed interviews focusing on health and nutrition status, performed anthropometric measurements and examinations. HGS was measured in both hands three times using a digital grip strength dynamometer and the highest result was reported. Cut-off values for low HGS were 30 kg for men and 20 kg for women. Dietary intake data were collected using the 24-h recall method.

**Results:** Of the survey participants, 937 aged 74.3 ± 0.3 years completed both the nutritional interview and HGS measurements. In a univariate analysis, total energy, protein, carbohydrate and fat

intakes were significantly associated with HGS. Increments of 100 kcal, and 10 grams of each macronutrient a day, were associated with decreased prevalence of lower HGS, with odds ratios (OR) of 0.90, 0.90, 0.95, and 0.84, respectively (*p* < 0.05 for all). In multivariate analysis adjusted for age, sex, household income, ethnic group and morbidity, the linear association between HGS and energy intake remained. However, only the association of HGS with fat intake remained significant (OR = 0.86, 95%CI: 0.74–0.99) in a similar model which also controlled for energy intake and body mass index.

**Conclusions:** Better nutrient intake appears to be associated with HGS in the Israeli elderly. However, further cohort or case-control studies are necessary to determine the causal relationship of these factors.

**Disclosure of Interest:** None declared.

#### OR47

##### MATCHED WEIGHT LOSS THROUGH INTERMITTENT OR CONTINUOUS ENERGY RESTRICTION DOES NOT RESULT IN COMPENSATORY ADAPTATIONS IN APPETITE: A PROOF OF CONCEPT RCT

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**Rationale:** Continuous energy restriction (CER) may be problematic due to compensatory adaptations promoting poor weight loss (WL). Intermittent energy restriction (IER) is an alternative WL strategy that may mitigate some of these adaptations. The aim of this pilot study was to compare the effects of CER and IER on appetite when the degree of WL is matched.

**Methods:** Women with overweight/obesity were recruited for a controlled feeding RCT to ≥5% WL (within 12 weeks) via CER (25% daily energy restriction with all foods provided) or IER (alternating ad libitum days and 75% energy restriction days with LighterLife total diet replacement products provided). Probe days were conducted by blinded investigators at baseline and post-WL. Following baseline measurements, 46 participants (BMI = 29.2 ± 2.4 kg/m<sup>2</sup>; age = 34.7 ± 10.7 y) were allocated to IER (n = 24) and CER (n = 22). Participants met with a dietitian each week to collect foods and track WL.

**Results:** 37 participants completed the intervention and 30 reached ≥5% WL [CER (n = 18): 6.3 ± 0.8% in 57 ± 16 days vs. IER (n = 12): 6.6 ± 1.1% in 67 ± 13 days; *p* = 0.43 and *p* = 0.10, respectively]. Body composition changed to a similar extent between groups after WL (*p* < 0.001), but no changes in RMR were observed. Hunger after a fixed meal decreased similarly between groups after WL (*p* < 0.05), but satiety quotient remained unchanged. Self-selected meal size decreased in CER only (*p* = 0.03). Both interventions improved dietary restraint, craving control, susceptibility to hunger and binge eating (*p* < 0.001).

**Conclusions:** CER or IER to ≥5% WL similarly reduced hunger and improved eating behaviours that promote overconsumption. This suggests that clinically significant diet-induced WL via CER or IER did not induce detrimental compensatory adaptations in appetite.

Trial registration: Clinicaltrials.gov as NCT03447600.

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**Disclosure of Interest:** None declared.



#### OR48 METABOLOMIC STUDY SUGGEST PRESERVED KIDNEY FUNCTION AS REQUIREMENT FOR TYPE 2 DIABETES REMISSION AFTER ROUX EN-Y GASTRIC BYPASS

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**Rationale:** About 60% obese of patients experience type 2 diabetes (T2D) remission after Roux-en-Y gastric bypass (RYGB), but the precise mechanisms are not yet fully understood. We developed a prospective clinical study to investigate the molecular basis of this metabolic outcome.

**Methods:** Plasma and urine samples were collected from 23 obese women with T2D, before and 3 months after RYGB. Samples were analyzed by liquid and gas chromatography-mass spectrometry. Wilcoxon test and fold change were applied to display altered metabolites.

**Results:** RYGB deeply changed plasma and urine metabolomic profile, mainly altering bile acids, uremic toxins, dicarboxylic acids, and different lipid classes ( $p < 0.05$ ). By comparing patients according to T2D remission, a discriminatory pattern of alterations was observed: succinic, aloxanoic, glycochenodeoxycholic, taurochenodeoxycolic and hidroxybutiric acids, along with transcrobetaine and trimethylamine n-oxide (TMAO) were discriminatory in T2D remission patients ( $n = 13$ ); while lithocholic and uric acids, piperidone and urobilin were distinct in T2D non-remission patients ( $n = 10$ ). Particularly, increased plasma TMAO was observed in all patients after RYGB, but this metabolite was only equally increased in urine of T2D remission patients, as an excretory route.

**Conclusions:** RYGB changed the metabolomic profile of obese patients, suggesting shifts in flux and use of key metabolites that could trigger T2D improvement. The metabolomic signature of T2D remission patients partially rely on a preserved kidney function and its local enzymes, while metabolites changed in T2D non-remission patients were previously associated with kidney disorders. Thus, our data raises the question of whether a kidney subclinical dysfunction could interfere in the metabolic state and consequently impair RYGB role on T2D remission.

**Disclosure of Interest:** None declared.

#### OR49 IMPACT OF MEAL COMPOSITION AND WALKING ON POSTPRANDIAL ATTENTION, MOOD, AND SATIETY IN OLDER ADULTS

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**Rationale:** Research suggests that attention, mood, and satiety can be influenced by meal composition and postprandial activity. The present

study examined whether this hypothesis applies to persons with a risk phenotype for cardiovascular/neurodegenerative diseases.

**Methods:** A randomized crossover trial was conducted in 26 subjects with metabolic syndrome traits (age  $70 \pm 5$  y; female: 8). Each subject participated in four controlled interventions: isoenergetic (4300 kJ) meals (Western diet high-fat meal, WD, and Mediterranean-type diet meal, MD) followed by either 30 min moderate walking ( $4.6 \pm 0.1$  km/h) or rest. Attention (Frankfurter Attention Inventory 2), mood (Multidimensional Mood Questionnaire), and the feeling of hunger and satiety (Visual Analogue Scales) were measured at fasting and 1.5, 3.0, and 4.5 h postprandially. Data were analyzed by linear mixed models.

**Results:** In all four interventions attention increased continuously in the postprandial period (time effect,  $P < 0.001$ ). After the WD, attention was lower after walking compared to resting (meal x activity effect,  $P < 0.05$ ). Postprandial mood was generally "good" with no treatment effects (meal x activity effect,  $P = 0.819$ ). Postprandial hunger decreased reaching minimum at 1.5 h after meal (time effect,  $P < 0.001$ ) with no treatment effects. Postprandial satiety increased reaching maximum at 1.5 h after meal (time effect,  $P < 0.001$ ) and was higher after MD compared to WD (meal effect,  $P < 0.001$ ).

**Conclusions:** Meal composition had no relevant impact on attention and mood in older subjects. After a typical WD resting instead of walking seems to have a more beneficial effect on postprandial attention. The MD leads to a strong and long lasting feeling of satiety, possibly resulting in a reduced energy intake in the further course of the day and, thus, a long-term effect on weight control.

**Disclosure of Interest:** None declared.

#### OR50 BIOIMPEDANCE ANALYSIS TO PREDICT MAJOR MORBIDITY IN PANCREATIC RESECTION. THE KEY ROLE OF PERIOPERATIVE INTERSTITIAL FLUID SHIFT

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**Rationale:** Perioperative over and under fluid infusion are associated with adverse outcome after pancreatic surgery (1). Aim of this study was to evaluate whether perioperative anthropometric and hydration parameters derived from bioimpedance vector analysis (BIVA) predicts the occurrence of major morbidity.

**Methods:** We prospectively measured BIVA of patients undergoing resection for pancreatic cancer on the day prior to surgery and on postoperative day (POD) 1. Intraoperative fluid infusions were provided according to goal-directed fluid therapy algorithms and postoperative fluid balance calculated by the difference between in and out estimates. Postoperative morbidity was scored by Clavien-Dindo Classification (CDC). Nonrandom association was tested using the Fisher exact test for categorical variables and the Mann-Whitney U test for continuous data. The Hotelling  $T^2$  test was used for multivariate hypothesis testing. Correlations between continuous variables were assessed with the Spearman  $\sigma$  test

**Results:** 249 patients were analyzed. 42 patients (16.5%) had a major morbidity (CDC  $\geq 3$ ). The amount of preoperative extracellular water (ECW) was significantly higher in patients who experienced CDC  $\geq 3$  [19.4 L (17.5–22.0) vs 18.2 L (15.6–20.6) in uncomplicated;  $p = 0.009$ ]. Also the hydration status on POD1 was significantly higher in patients

who experienced major complications [23.9 L (20.6–22.5) vs 19.7 L (17.3–23.1),  $p=0.020$ ]. No correlation between ECW and the fluid balance on POD1 was detected ( $p=0.215$ ). Similar results were obtained for hydration status. Age ( $p=0.035$ ), female gender ( $p<0.001$ ), high BMI ( $p<0.001$ ) and malnutrition ( $p=0.037$ ) were independent preoperative predictors of ECW retention.

**Conclusions:** Excessive extracellular fluid retention significantly predicted major morbidity. Fluid balance is inaccurate in estimating hydration status as it disregarded the fluid shift into the interstitial space. Specific preoperative characteristics of the patient can predict the risk of interstitial fluid retention.

#### Reference

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**Disclosure of Interest:** None declared.

## Oral Communication VI: Paediatrics

### OR51

#### ASSESSMENT OF NUTRITIONAL STATUS AND NUTRITIONAL RISK IN HOSPITALIZED TURKISH CHILDREN

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**Rationale:** Although all hospitalized patients need to be screened for malnutrition risk, no universal nutritional risk screening tool have yet existed for paediatric patients. This study aimed to define the nutritional state of children admitted to a tertiary paediatric hospital and to evaluate nutritional risk score tools in these children.

**Methods:** We performed a cross-sectional study comparing three published malnutrition risk screening tools (STRONG<sub>kids</sub>, PYMS and STAMP), applying them to children admitted to a paediatric ward for at least 24 hours. The total scores were calculated for each child, and children were then classified into high, medium and low-risk groups, as per published cut-offs. Weight and height or recumbent length were measured and recorded for all inpatient children within the first 24 h of admission. BMI was calculated and z-scores were derived for all measurements. Malnutrition was defined according to the WHO guidelines plotted on the national growth charts with  $<-3$  SD of weight-for-height (WFH) or height-for-age (HFA) (representing severe malnutrition) and  $<-2$  SD of WFH or HFA (representing moderate malnutrition) as the cut-off point. When WFH z-score was not available, BMI z-score was used. The relationships between anthropometric data and nutritional risk screening tool results was assessed by Pearson correlation.

**Results:** Of the 276 eligible children, aged 1 month to 17 years (mean age 5.9 years), 269 (44.2% girls and 55.8% boys) participated. The prevalence of moderate and severe malnutrition in the inpatients were 11.9% and 14.1%, respectively. The moderately and severely malnourished patients were predominantly aged  $<5$  years (65.6% and 71.1% respectively). The STRONG<sub>kids</sub>, PYMS and STAMP tools identified 77.1%,

86.7% and 80% of the moderately and severely malnourished patients in the medium- and high-risk groups. The PYMS tool classified the most (36.3%) and STRONG<sub>kids</sub> the least (8.2%) children as having a high risk for malnutrition. The PYMS tool correlated more strongly with anthropometric measurements ( $r=0.366$ ) than the STAMP ( $r=0.337$ ) and STRONG<sub>kids</sub> ( $r=0.140$ ) tools ( $p<0.05$ ).

**Conclusions:** PYMS was the most accurate screening tool for detecting malnutrition and may be useful as the screening method in our hospital. Routine screening for the risk of malnutrition is important in detecting at-risk inpatient children who would otherwise be left without dietary intervention.

**Disclosure of Interest:** None declared.

### OR52

#### FOOD HABITS AND DIETARY INTAKE IN ITALIAN CHILDREN WITH SPINAL MUSCULAR ATROPHY TYPE 1 AND 2

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**Rationale:** Spinal Muscular Atrophy (SMA) is an autosomal recessive neurodegenerative disease characterized by degeneration of spinal cord motor neurons. SMA patients suffer from swallowing and gastrointestinal problems that could reduce energy and nutrients intake. This study aimed to compare the dietary intake of Italian children affected by SMA type 1 (SMAI) and 2 (SMII) with national recommendation.

**Methods:** 188 SMAI (94M, 63 ± 40 months) and 177 SMII patients (88M, 51 ± 37 months) were enrolled. 3-days food dietary records was used to investigate feeding behavior and type of food used. Dietary records were analyzed using WinFood version 3.0. Italian recommended daily allowances of energy and nutrients (LARN, 2014) were used as reference. Nutrients intakes are expressed as mean and standard deviation (SD) of adequacy indexes calculated.

**Results:** 60.1% of SMAI children was fed per os, 36.2% via gastrostomy and 3.7% used nasogastric tube. 100% of SMII was fed per os. SMAI consume 85.7 ± 27.5 kcal/kg body weight (BW), SMII 65.3 ± 24.2 kcal/kg BW. Carbohydrates were 70% of recommendation. Protein were 2.7 ± 1.1 g/kg BW in SMAI and 2.6 ± 1.0 g/kg BW in SMII. Fibers were 68% of recommendation. Fat and sugar intakes agreed with recommendations. Concerning micronutrients, SMAI and SMII introduced, respectively, 72.8 ± 57.5% and 54.6 ± 44.5% of vitC; 26 ± 18.5% and 25.5 ± 15.1% of vitB9, 39.9 ± 50.9% and 14.4 ± 14.7% of vitD, 46.8 ± 31.4% and 39.4 ± 21% of vitE, 64.6 ± 29.2% and 54.4 ± 23.7% of calcium, 87.5 ± 42.2% and 44.9 ± 21.5% of iron, and 23 ± 16.3% and 30.8 ± 13.4% of magnesium. All micronutrients intake resulted statistically different from recommendation ( $p<0.05$ ).

**Conclusions:** Both SMAI and SMII children has an adequate daily, but consume more proteins than recommendations, and micronutrients' intake results 50% lower than recommendations. Therefore, specific dietary reference intakes for SMA children are needed to enhance nutritional management.

**Disclosure of Interest:** None declared.

## OR53

**NEIGHBORHOOD ENVIRONMENT MEDIATES THE RELATIONSHIP BETWEEN SOCIOECONOMIC STATUS AND FAT MASS IN CHILDREN AND ADOLESCENTS**

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**Rationale:** To investigate the possible mediating effects of neighborhood environment on the inverse association between socioeconomic status (SES) and percentage fat mass (FM%) in children and adolescents.

**Methods:** Study population: 506 boys and 539 girls aged 9–15 y from the Kiel Obesity Prevention Study (KOPS). FM was measured by bioelectrical impedance analysis. Socioeconomic status (parental income/education) was obtained by validated questionnaires. Statistical data of built and social environment (e.g. traffic density, parks and public playgrounds, food outlets, percentage of foreigners, density of welfare) were reported by local authorities. Product-of-coefficients method was conducted to examine mediator effects (indirect effects) on the relationship between SES and FM% > standard deviation score (SDS) ( $c$  = total effects/ $c'$  = direct effects) and their ratio to total effects, adjusted for age, sex and nationality.

**Results:** Income ( $c_1 = -0.21$ ,  $p < 0.001$ / $c'_1 = -0.13$ ,  $p < 0.01$ ) and education ( $c_2 = -0.28$ ,  $p < 0.001$ / $c'_2 = -0.20$ ,  $p < 0.01$ ) were inversely related to FM%>SDS. The relationship between income and FM%>SDS was partially mediated by density of welfare (54%), playground distance to residential address (2%) and traffic density (-15%, inverse effect) resulting in a total mediating effect of 41%. The relationship between education and FM%>SDS was partially mediated by density of welfare (32%) and traffic density (-5%, inverse effect) resulting in a total mediating effect of 27%.

**Conclusions:** There are significant mediator effects of neighborhood environment on the relationship between SES and fat mass. Thus, successful obesity prevention strategies should address living conditions of built and social environment.

**Disclosure of Interest:** None declared.

## OR54

**THE REVE STUDY, PRELIMINARY RESULTS. A MONOCENTRIC SINGLE-ARM STUDY TO CHARACTERIZE THE LONG-TERM SAFETY AND EFFICACY OF GLP-2 ANALOG (TEDUGLUTIDE) IN THE MANAGEMENT OF SHORT BOWEL SYNDROME IN PEDIATRIC PATIENTS ON HOME-PARENTERAL NUTRITION**

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**Rationale:** GLP2-analog treatment has been demonstrated to be efficient in adult and children with short bowel syndrome (SBS). This study was designed to evaluate the efficacy and the safety of Teduglutide during one year in children with long-term intestinal failure due to SBS.

**Methods:** Children with SBS followed in our center with more than two years of home parenteral nutrition (HPN), small bowel length < 80 cm and stable on long-term PN (no decrease of PN in the past 6 months) were consecutively included in the study. At baseline they underwent a 4 days hospitalisation to perform a stool balance

analysis with the duplicate meal technique, blood tests, abdominal ultra-sound, densitometry, colonoscopy if age >12 years old and to initiate the treatment. Teduglutide was administered sub-cutaneously at the dose of 0.05 mg/kg/day. Visits were every 2 weeks for 8 weeks, then every 4 weeks, then every 12 weeks from week 12 until week 48. At week 48, a second hospitalisation will take place to repeat the stool balance analysis. This study was registered on clinical trials NCT03562130.

**Results:** Nine months after the first inclusion, 17 children had been enrolled. Mean age was 10 years old (range 5–16). Four children had SBS type 1, seven had type 2, and six type 3. The results of their stool balance analysis at baseline are shown in table 1.

**Table 1**

Food intake*	1500 kcal/day
Stools	1200 g/day
Lipid absorption	44%
Nitrogen absorption	50%
Carbo-hydrates absorption	67%
Total energy absorption	58%

Results are expressed in mean.

\*Two patients received tube feeding on top of oral feeding.

At week 12, fifteen children (100% children who reached the week 12 endpoint) experienced a decrease >20% of PN requirements in calories and in volume, 29% and 28% respectively (mean). Six children reached week 24 with a further decrease of PN intake at a mean of 39% from baseline. Two children could be evaluated at the week 36 endpoint: one was weaned from PN, the other one had decreased his PN dependency by 50% in calories and by 66% in volume from baseline, and could experience one night a week without a PN infusion. Z-score in weight and height remained stable.

All the children experienced a reduction in stool frequency or a reduction of the ostomy flow and an improvement of the stool consistency. Citrulline plasma levels increased from 14  $\mu\text{mol/l}$  to 24  $\mu\text{mol/l}$  (mean) at week 12.

Six children suffered from mild abdominal pain in the first month of treatment. Only one severe adverse event was reported with an increased ostoma output and abdominal pain which led to a hospital admission for 3 days at week 17; no direct link was made with the treatment which was maintained.

**Conclusions:** All the children included in the study had severe malabsorption as shown by the stool balance analysis. The first results are encouraging on the safety and the efficacy of the treatment. PN reduction still occurred after week 36. The results of the second stool analysis at week 48 should confirm the intestinal absorption improvement that is observed clinically.

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## OR55

**INFLUENCE OF PROTEIN INTAKE IN THE FIRST YEAR OF LIFE ON BODY SIZE AND IGF-I LEVELS**

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**Rationale:** Rapid weight gain during infancy is associated with increased risk of obesity, but the underlying mechanisms of these processes are still to be fully revealed. It was stipulated that insulin-like growth factor-I (IGF-I) might be associated with rapid linear growth. This paper examines whether protein intake from complementary feeding is associated with IGF-I levels and greater growth rates in children of 1 year of age.



**Methods:** This was a prospective observational study. The eligible population was formed of 75 healthy infants examined at their check-up visits at 6 and 12 months. All participants were assessed with anthropometry, 3 days food record and blood analysis of IGF-I and serum urea at the age of 1 year. The subjects were assessed either to the group with low protein (<2.5 g/kc/day) or to the high protein group (>2.5 g/kc/day).

**Results:** At 6 months of age, there was no difference between girls and boys regarding growth parameters, while at 12 months, the boys were larger. Girls had considerable higher values for IGF-I than boys (78.3 [51.3; 114.2]) vs 72.5 [49.3; 92.1]. Protein intake was significantly correlated with serum urea and IGF-I. The infants receiving <2.5 g protein/kg of body weight had median values for IGF-I with 35% lower than the ones receiving higher amounts.

**Conclusions:** The introduction of solid food in children diet provides increasing amount of protein, sometimes exceeding real needs. Our results, although observational, provide evidence that higher amount of protein during complementary feeding promotes further higher rates of growth.

**Disclosure of Interest:** None declared.

#### OR56 PREGNANCY EXPOSURE TO MATERNAL SMOKING AND HIGH CAFFEINE INTAKE IS ASSOCIATED WITH INCREASED CHILDHOOD ASTHMA RISK: EVIDENCE FROM A BIRTH COHORT

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**Rationale:** During pregnancy, the caffeine crosses the placenta barrier and its elimination half-life rises in late gestation, exposing the fetus. Although several observational surveys proposed that higher intake of caffeine may be associated with growth restriction, reduced birth weight and preterm birth, its association with asthma during childhood has not yet been explored. Moreover, there are conflicting data about the fetal safety of maternal dietary caffeine consumption, particularly at levels of 300 mg/day or greater. Therefore, we aimed to evaluate the association between high levels of caffeine consumption in pregnancy and asthma at 10 years of age.

**Methods:** We studied 1451 mothers and children enrolled in the population-based birth cohort – Generation XXI in Porto, Portugal. Portion sizes and frequency from coffee, decaffeinated, black and green tea and cola throughout pregnancy, including first, second and third trimester, were collected during the face-to-face interviews with structured questionnaires at 24 to 72 hours after birth. Overall caffeine estimation throughout pregnancy was made multiplying the portion size by the multiple/fraction of daily frequency intake for each food item. Asthma was defined based on caregiver self-reported diagnosis at 10 years of age. Logistic regression models were performed to evaluate the association between pregnancy consumption levels of caffeine and asthma.

**Results:** After adjustments for maternal diagnosis of asthma, education and body mass index (BMI), gestational age, type of birth, and children's sex and BMI z-scores, smoking mothers with caffeine consumption levels of 300 mg/day or greater had 3.58 times higher risk of having a child with asthma than smokers with levels inferior to 300 (OR = 3.58; CI 95% 1.16 to 11.0).

**Conclusions:** In conclusion, children whose mothers smoked and had consumption levels of caffeine equal or above 300 mg/day, were at higher risk to develop asthma. Recommendations should be provided to avoid smoking and reduce caffeine intake throughout pregnancy.

**Disclosure of Interest:** None declared.

#### OR57 INTRAVENOUS IRON SUPPLEMENTATION IN CHILDREN WITH INTESTINAL FAILURE ON HOME PARENTERAL NUTRITION

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**Rationale:** The intravenous trace elements formulations available for children in Poland are Peditrace (Fresenius-Kabi®) which does not contain iron and Addamel (Fresenius-Kabi®) which contains 2 µg Fe/ml but is registered for children with body weight >15 kg. The aim of the study was to assess the prevalence of anemia and efficacy of intravenous iron supplementation in children on home parenteral nutrition.

**Methods:** 54 children (age 5–184 months, median 48,5 months) on home parenteral nutrition were included into the study. 18 patients were additionally supplemented with intravenous iron sucrose formula (3 mg/kg of Venofer – Vifor France®) during control visits (last dose 2–3 months before the study). All patients received Peditrace as an intravenous trace elements formulation. Laboratory parameters of RBC, haemoglobin, ferritin and iron concentration, MCV, MCH, MCHC and TIBC, were analyzed using Mann-Whitney test and Spearman correlation.

**Results:** The prevalence of anemia in the whole group was 37% (20 out of 54). The median iron and ferritin concentration was very low in the whole group of patients – 45 µg/dl (range 14–195) and 29,7 ng/ml (range 3–273) respectively. Iron concentration was significantly correlated with ferritin, haemoglobin, MCV, MCH, MCHC and RBC ( $p < 0,05$ ). Patients with ileostomy had lower iron concentration, MCV and RBC than others ( $p < 0,05$ ). Haemoglobin concentration was lower in group of patients who received i.v. iron supplementation than in others (10,6 vs 11,8 g/dl;  $p < 0,05$ ).

**Conclusions:** Iron deficiency anemia is common in children on long term parenteral nutrition. Every 2–3 months i.v. supplementation of iron sucrose is not sufficient in these patients.

**Disclosure of Interest:** None declared.

#### OR58 IS BOWEL LENGTHENING A STEP TOWARDS ENTERAL AUTONOMY?

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**Rationale:** Bowel lengthening procedures (longitudinal intestinal lengthening and tailoring – LILT procedure and serial transverse enteroplasty procedure – STEP) are one of the treatment options for children with short bowel syndrome but precise indications, timing and outcomes are still the subject of debate.

The aim of the study was to review our centre experience in terms of decreasing the proportion of Estimated Average Requirement (EAR) given by PN/nights on PN post-bowel lengthening surgery (LILT and STEP procedures).

**Methods:** We collected data retrospectively from electronic and paper case notes of paediatric patients on home PN that underwent a bowel lengthening procedure over a 17 year period (2001–2018). The timing of different procedures was documented and we calculated the proportion of EAR delivered by PN/nights on PN pre-bowel lengthening, 1-year post procedure and at the present time.

**Results:** 10 children (7 males) with a median (range) age of 10.3 years (3.7–17) underwent a bowel lengthening procedure. They were born at a median (range) gestational age of 34+2 weeks (27.2–40). The cause for short bowel was gastroschisis in 7/10 with 1 case of NEC and 2 of bowel atresia. The median (range) initial bowel length was 17.5 cm (10–30); none had ICV or full colon although 9/10 had a partial colon. The PN was started at a median (range) of 2 days of life (1–29). The general approach to bowel lengthening was to consider when further adaptation seemed unlikely and there was no progress with advancing enteral feeds (some patients were also symptomatic, e.g. abdominal pain, bloating). 3 patients underwent a LILT procedure (2 of whom also had later STEP), 9 underwent a first STEP procedure at a median (range) age of 2.6 years (0–11.5), 3 patients underwent a second STEP (1 had a LILT previously) and one patient underwent a third (duodenal) STEP at the age of 10.7 years. The median (range) bowel length pre first STEP was 27 cm (17–60), after the first procedure the median (range) was 55 cm (26–90) and for the ones who had a second procedure 108 cm (85–125). Only one patient came off PN (6 months after a STEP procedure); his % EAR derived from PN before procedure was 80%, with 7 nights PN per week; however, before surgery he was off PN for a total of 14.7 months over 5 different periods between 2002 and 2006 and always restarted due to poor weight gain. One patient underwent a combined liver and small bowel transplant, due to end stage liver disease and one patient had isolated small bowel transplant due to loss of venous access at 7 and 9.3 years of age respectively; both are off PN, one still on IV fluids. One patient died age 7 months from end stage liver disease having had a STEP aged 6 days and was on full PN at the time of death. The median (range) % EAR derived from PN before surgery was 82.8% (34%–105%; n = 8), and the median (range) days of PN were 7 days/week (2–7). 1 year post last procedure undertaken, the PN % EAR decreased to 48.8% (median of 3.5 nights/week; n = 8) and currently the EAR given by PN (excluding the transplanted and death patient) is 42.5% (4 nights/week; n = 7). In one patient the symptoms improved post lengthening but this was confounded by social issues.

**Conclusions:** Only 1/10 child who had bowel lengthening came off PN after surgery in our centre and he had good enteral tolerance at the time of surgery but could not grow when PN was stopped. The rest of the patients that are alive and have not undergone small bowel transplant (n = 6) are still PN dependant although the % EAR from PN/nights on PN have slightly reduced. It is difficult to know if this was due to the surgery or further bowel adaptation.

The precise indications, benefits and long term complications of bowel lengthening procedures remain unclear. It is possible that only patients who are close to full enteral autonomy should be considered for this surgery.

**Disclosure of Interest:** None declared.

#### OR59

### ERYTHROCYTE SELENIUM AND SELENOPROTEIN P ARE INDEPENDENTLY ASSOCIATED WITH THE ENDOTHELIAL ADAPTATIVE RESPONSE IN CHILDREN WITH SYSTEMIC INFLAMMATION

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**Rationale:** Experimental studies have demonstrated a relationship between adhesion molecules as biomarkers of endothelial function and selenium status under different conditions (1). However, there are

few clinical studies to support the hypothesis that selenium has an active role in endothelial function. Unlike plasma selenium, erythrocyte selenium is a reliable marker of selenium status in the presence of systemic inflammation, as it is unaffected by the acute phase response (2). We tested the hypothesis that selenium nutritional status, as measured by erythrocyte selenium and selenoprotein P, is associated with endothelial adaptative response during the acute phase of systemic inflammation in children.

**Methods:** A prospective study of 109 children (median age of 22.4 months) admitted with circulatory shock, 22% of them malnourished according to the WHO standards. Patients were evaluated for plasma concentrations of the adhesion molecules ICAM-1, VCAM-1, P-Selectin, and EndoCAM at days 1, 2 and 3 of the ICU stay. Erythrocyte selenium and Selenoprotein P concentrations were assessed on admission. We performed multivariable repeated measures analysis of variance controlling for the Pediatric Index of Mortality 2, C-reactive protein, procalcitonin and serum lactate concentrations, and anthropometric nutritional status.

**Results:** Mean (SD) erythrocyte selenium concentration was 75.8 (3.7) µg/L, plasma selenium: 60.4 (28.1) µg/L and Selenoprotein P: 83.8 (44.5) nmol/L. There was no association between anthropometric indices and erythrocyte or plasma selenium. There were positive, independent associations between erythrocyte selenium and P-selectin and EndoCAM plasma concentrations, and between Selenoprotein and P-Selectin plasma concentration. The increase of 1.0 µmol/L in erythrocyte selenium resulted in increases of 4.7 nmol/L (95% CI: 2.6;6.9, p < 0.001) in P-Selectin and of 0.004 ng/mL (95% CI: 0.001;0.006, p = 0.02) in EndoCAM. The increase of 1.0 nmol/L in Selenoprotein P resulted in the increase of 1.7 nmol/L (95% CI: 0.50;3.0, p = 0.006) in P-Selectin. There was no association between selenium status and ICAM-1 or VCAM-1. Plasma selenium concentration was not associated with any of the adhesion molecules.

**Conclusions:** Selenium nutritional status is associated with the endothelial adaptative response during acute systemic inflammation in children. This association is independent of the degree of inflammatory response and clinical severity.

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**Disclosure of Interest:** None declared.

## Oral Communication VII: Vitamins/Hormones/Minerals/Mediators

#### OR60

### EVALUATION OF SERUM SELENIUM, ZINC AND COPPER IN AN INTENSIVE CARE UNIT. THEIR RELATIONSHIP TO THE PROGNOSIS AND EVOLUTION OF PATIENTS

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**Rationale:** Zinc,<sup>1</sup> selenium<sup>2</sup> and copper are essential trace elements in critical care patients.<sup>3,4</sup> Our aim was to correlate their serum concentrations with severity, clinical evolution and patients prognosis.

**Methods:** We designed a prospective study, with four months duration, in a Polivalent Intensive Care Unit in Portugal. We evaluated serum zinc (Zn), selenium (Se) and copper (Cu) levels at admission to ICU and correlated them with organ failure indicators

(defined based on SOFA), acute phase markers, clinical evolution (ICU length of stay, days on ventilator, vasopressor needs, infectious complications and renal function substitution needs) and hospital prognosis.

**Results:** A total of 200 consecutive patients (59% males, 41% females; median age 65,8 years; age range 22–90 years) were included. Their median SAPS II and APACHE II scores were 42,96 + 21,05 and 19,46 + 10,4, respectively. 69,5% of the patients had two or more organ failures at admission. On admission low zinc levels were present in 74% of patients, 20% had low selenium levels whereas serum copper was elevated in 8% of the patients.

Patients with respiratory failure had lower Zn ( $p=0,005$ ) and Cu ( $p=0,047$ ) levels whereas those with hemodynamic failure had lower Zn ( $p=0,000$ ) and Se ( $p=0,002$ ) levels. Lower levels of Se were also observed in patients with renal failure ( $p=0,002$ ) and hematological failure ( $p=0,028$ ). Lower zinc and selenium levels on admission were associated with longer periods of ventilation ( $r(\text{Zn}) = -0,175, p=0,014$ , and  $r(\text{Se}) = -0,149, p=0,037$ ).

Patients who developed infectious complications during ICU stay had higher levels of Cu on admission ( $p=0,007$ ).

Finally, on admission, patients with multiple organ failure had significant lower zinc ( $p=0,004$ ) and selenium ( $p=0,005$ ) levels.

We didn't find any relationship between trace elements levels and ICU length of stay, ICU mortality or hospital mortality.

**Conclusions:** Patients with worst prognosis had significantly lower zinc and selenium levels on ICU admission, whereas higher copper levels were also observed on patients who developed infectious complications during their ICU stay.

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**Disclosure of Interest:** None declared.

#### OR61

### SKELETAL MUSCLE AS A MAJOR SOURCE OF ACUTE-PHASE REACTANTS (APR) DURING CANCER CACHEXIA

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**Rationale:** Reliable parameters for early diagnosis of cancer cachexia are still lacking and molecular mechanisms of muscle atrophy are incompletely unraveled. The goal of this study is to identify new pathways and potential biomarkers of muscle atrophy during cancer cachexia using proteomic analysis.

**Methods:** Ten days after C26 carcinoma cells SC injection, a classical model of cancer cachexia in mouse, gastrocnemius samples were collected for protein extraction and fractionation into sarcoplasmic (SF) and myofibrillar fractions (MF). Differential label free proteomics was used to compare muscle extracts from cachectic and control mice ( $n=6/\text{group}$ ) on a 2Dnano-UPLC coupled to a QExactive Plus Hybrid Quadrupole-Orbitrap mass spectrometer. Protein identifications and

relative quantitations were obtained using MaxQuant and the differential analysis was performed using Perseus. Different softwares were used to identify the pathways dysregulated and the proteins potentially secreted.

**Results:** Cachexia was confirmed by decreased muscle mass and induction of several atrogenes. By label-free mass spectrometry, 960 proteins were obtained in SF and 935 in MF, with 228 differentially abundant between control and cachectic mice in SF and 198 in MF. Among the most down regulated proteins are the respiratory chain proteins (five complexes) and ribosomal proteins (40S and 60S) as well as the main myosin heavy chains (Myh7,1,4). These observations suggest an impairment in protein synthesis and energy generating processes, which may contribute to muscle atrophy and weakness observed in cancer cachexia. Among the most significant upregulated and potentially secreted proteins during cancer cachexia are several acute phase reactants (APR): Haptoglobin (Hp), Serum Amyloid A (SAA), Alpha-1-acid glycoprotein 1 (Orm1), C3 complement (C3) and Serpina3n. These changes were confirmed by Western Blot ( $P < 0,001$ ) and RTq-PCR (increase from 2- to 23-fold;  $P < 0,001$ ) indicating a local muscle production. Similar changes were also observed in two different murine models of cancer cachexia. Induction of APR expression did not result from decreased food intake. Administration of an anti-IL-6 antibody in C26 mice was able to counteract the induction of Hp, SAA1 and Serpina3n but not C3 and Orm1. However, the role of IL-6 was indirect as IL-6 failed to stimulate the expression of these APR in C2C12 myotubes. In contrast, myotube atrophy caused by glucocorticoids or proinflammatory cytokines (TNF-alpha/IFN-gamma) was associated with increased mRNA for most of these APR, confirming their increased production by muscle cells and indicating the role of glucocorticoids and proinflammatory cytokines in this induction.

**Conclusions:** Our study identifies some major pathways potentially involved in muscle atrophy and demonstrates the marked increased production of APR by skeletal muscle during cancer cachexia. Further studies are required to unravel the roles of these proteins in muscle atrophy and their interest as potential biomarkers of cancer cachexia.

**Disclosure of Interest:** None declared.

#### OR62

### UNACYLATED GHRELIN PLASMA CONCENTRATION DECREASES WITH AGE AND INDEPENDENTLY PREDICTS 5-YEAR MUSCLE MASS AND STRENGTH IN NON OBESE HUMANS

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**Rationale:** Unacylated ghrelin (UnAG) is an emerging modulator of skeletal muscle metabolic pathways with reported anti-oxidative, anti-inflammatory, insulin-sensitizing and anabolic actions in rodent healthy and disease models. Aging is associated with multiple alterations of systemic and skeletal muscle metabolism which contribute to muscle loss, leading to frailty and increased morbidity and mortality. Potential associations between aging, UnAG and muscle mass and whether ghrelin forms predict future muscle mass and strength in lean humans remain currently undefined.

**Methods:** We investigated associations between age and ghrelin profile [total (TG), acylated (AG) and unacylated hormone (UnAG)] in 580 lean ( $\text{BMI} < 25 \text{ kg/m}^2$ ) individuals from the North-East Italy MoMa population study (Age:  $47 \pm 14$  y; M/F: 266/314). Moreover, 153 subjects (baseline age:  $47 \pm 16$  y; M/F: 72/81) were investigated after 5 years for muscle mass by bioelectrical impedance and muscle strength by hand-grip assessment.

**Results:** Both TG and UnAG were negatively associated with age ( $P < 0,01$ ) in the study cohort. In multiple regression analysis, these



results were also independent of gender, BMI and plasma markers of metabolic disease. In the follow-up subgroup, TG and UnAG but not AG positively predicted 5-year muscle mass and muscle strength, also after multiple adjustments for confounding variables.

**Conclusions:** In lean subjects from a North-East Italy general population cohort, UnAG decreases with aging. In addition, UnAG but not AG selectively and independently predicts 5-year muscle mass and strength. These results suggest UnAG should be further investigated as a potential modulator of aging related muscle wasting.

**Disclosure of Interest:** None declared.

#### OR63

##### A PHASE 1, SINGLE-BLIND, PLACEBO-CONTROLLED, 3-ARM CROSS-OVER TRIAL OF FOOD-GRADE PEPTIDES WITH OREXIGENIC PROPERTIES IN MURINE MODELS

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**Rationale:** Methods to stimulate appetite in the sick or elderly remains a challenge with few safe therapeutic options. Ghrelin has received considerable attention as a therapeutic target to stimulate food intake in patients with anorexia.

**Methods:** A single-blind, 3-arm (placebo, casein bioactive MF1145 and whey bioactive UL-2-141) cross-over trial was conducted in healthy male volunteers. Participants received 26 mg/kg of both bioactives and placebo. Outcome measures were energy & protein intake from an ad libitum lunch and subjective appetite sensations as assessed by visual analogue scale (VAS). Basal and postprandial levels of active ghrelin (AG) were measured.

**Results:** Overall, 22 male participants (mean age 27 years) were included, average BMI was 24.6 kg/m<sup>2</sup>. Mean energy and protein intakes at lunch when treated with placebo were 1343 kcal (95% CI: 1215–1471 kcal) and 74 g (95% CI: 66–81 g), respectively. Energy and protein intakes were not significantly different from placebo for either treatment ( $p=0.918$ ,  $p=0.319$  for UL-2-141 and  $p=0.889$ ,  $p=0.959$  for MF1145, respectively). Similarly, appetite, hunger and satiety responses on VAS were not significantly different from placebo for either treatment. AG peak after lunch on placebo was 653 pg/ml (95% CI: 511–794 pg/ml). Treatment with UL-2-141 and MF1145 resulted in 139 pg/ml,  $p=0.021$  and 114 pg/ml,  $p=0.045$  reduction in postprandial AG compared to placebo, respectively. However, when controlling for fasting AG, the pattern was no longer significant ( $p=0.590$  and  $p=0.877$  respectively). Pre-prandial AG peaks were not significantly different across treatments.

**Conclusions:** While these peptides have previously demonstrated ghrelinergic effects in rats, no effect on appetite or food intake in humans was identified by this study. This may be attributable to the small sample size or low dose. Repeating the study in subjects with established anorexia may be prudent in order to target an abnormal ghrelinergic response.

**Disclosure of Interest:** None declared.

#### OR64

##### A GREEN-MEDITERRANEAN WEIGHT LOSS DIET, SUPPLEMENTED WITH MANKAI DUCKWEED, PRESERVES IRON-HOMEOSTASIS IN HUMANS AND IS EFFICIENT IN REVERSAL OF ANEMIA IN RATS

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**Rationale:** Decreased dietary meat may deplete iron stores, as plant-derived iron bioavailability is typically limited. We aim to explore the effect of a low-meat Mediterranean (green-MED) diet, supplemented with *Wolffia-globosa* duckweed (Mankai: rich in protein and iron) as a food source for humans, on iron-status. We further examined the specific iron bioavailability of Mankai in rats.

**Methods:** 294 abdominally-obese/dyslipidemic (mean age = 51.1 yrs; mean body-mass-index = 31.3 kg/m<sup>2</sup>; mean waist circumference 111 cm for men and 103 cm for women; 88% men, non-anemic participants were randomized to physical activity (PA), PA+MED diet or PA+green-MED diet. Both iso-caloric MED groups consumed 28 g/day walnuts and the low-meat Green-MED further consumed green tea (800 mL/day) and Mankai (100 g/green-shake/day). In a complementary animal experiment, following 44-days of an iron-deficient anemia-inducing diet, 50 female rats (age=3 weeks; Sprague-Dawley strain) were randomized into: iron-deficient diet (vehicle), or vehicle+iso-iron: ferrous-gluconate (FG)14, Mankai-50 and Mankai-80 versions (1.7 mg · kg<sup>-1</sup> · day<sup>-1</sup> elemental iron), or FG9.5 and Mankai50-C version (1.15 mg · kg<sup>-1</sup> · day<sup>-1</sup> elemental iron). The specific primary aim for both studies was changes of iron homeostasis parameters.

**Results:** After 6 months of intervention and significant weight loss across all intervention groups, iron-status trajectory did not differ between PA and PA+MED groups. Hemoglobin modestly increased in the PA+green-MED group (0.23 g/dL) as compared to PA (–0.1 g/dL;  $p < 0.001$ ) and PA+MED (–0.1 g/dL;  $p < 0.001$ ). Serum-iron and serum-transferrin saturation increased in the PA+green-MED group as compared to the PA-group (8.21 µg/dL vs. –5.23 µg/dL and 2.39% vs. –1.15%;  $p < 0.05$  for both comparisons), as did folic acid ( $p = 0.011$ ). In rats, hemoglobin decreased from 15.7 mg/dL to 9.4 mg/dL after 44 days of diet-induced anemia. Following the post-depletion treatment, the vehicle-treated group had a further decrease of 1.3 mg/dL, whereas both FG and Mankai iso-iron treatments similarly rebounded hemoglobin levels (FG14:+10.8 mg/dL, Mankai50:+6.4 mg/dL, Mankai80:+7.3 mg/dL; FG9.5:+5.1 mg/dL, Mankai50-C:+7.1 mg/dL;  $p < 0.05$  for all vs. vehicle group).

**Conclusions:** In humans, green-MED, low-meat, diet does not impair iron-homeostasis. In rats, iron derived from Mankai (green-plant protein source) is bioavailable and efficient in reversal of anemia.

**Disclosure of Interest:** None declared.

#### OR65

##### DOES THE RISK VARIANT OF THE OBESITY-ASSOCIATED GENE FTO RS9939609 AFFECT INSULIN SENSITIVITY IN ADULTS WITH OBESITY CLASS 2 AND 3?

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**Rationale:** Metabolic effects of FTO related to its effects on BMI have been proposed; however, they have been only sparsely investigated in obese individuals. We investigated whether the FTO risk allele SNP

**Table 1** (abstract: OR65): Participants and hepatic insulin resistance by genotype, mean values (SD)

Risk allele	Age, years	BMI, kg/m <sup>2</sup>	GIR, $\mu\text{mol}/\text{kg}/\text{min}$	Ra, $\mu\text{mol}/\text{min}/\text{kg}$	Rd, $\mu\text{mol}/\text{min}/\text{kg}$	MCR, ml/min/kg
T/T	38.8 (9.5)	43.1 (5.7)	6.56 (2.74)	2.88 (1.09)	10.00 (2.02)	2.04 (0.39)
A/T	43.7 (10.1)	41.8 (4.7)	7.44 (3.63)	2.81 (1.33)	10.74 (2.44)	2.14 (0.61)
A/A	43.9 (13.3)	44.3 (4.7)	6.12 (2.16)	2.64 (0.93)	9.32 (1.55)	1.82 (0.32)
Linear reg. Coef. (p-value) (A/T)	4.9 (0.075)	-1.32 (0.370)	0.88 (0.325)	-0.07 (0.856)	0.73 (0.180)	0.09 (0.504)
Linear reg. Coef. (p-value) (A/A)	5.1 (0.116)	1.26 (0.389)	-0.43 (0.533)	-0.24 (0.386)	-0.68 (0.180)	-0.22 (0.026)

rs9939609 is associated with insulin resistance (IR) and in particular with hepatic IR.

**Methods:** In 79 participants (68% women) with BMI obesity class 2-3, hepatic IR was measured with a 2h hyperinsulinaemic euglycaemic clamp (0.3 i.u./kg/min) including a stable tracer infusion of [6,6-2H<sub>2</sub>] glucose. The sample of study participants, recruited from an outpatient obesity clinic, was double blindly enriched to achieve a study population of 1/3 with double risk (A/A-genotype), 1/3 with single risk (A/T) and 1/3 with the non-risk allele (T/T). We calculated glucose infusion rate (GIR), rate of appearance and disappearance (Ra and Rd) as tracer variables, and metabolic clearance rate (MCR).

**Results:** Although we did not detect genotype effects on the tracer variables we found a significant negative effect of FTO risk on MCR ( $p = 0.026$ ). For the whole study population women were more insulin sensitive than men, indicated by higher GIR ( $p < 0.002$ ), lower Ra response ( $p < 0.02$ ) and higher MCR ( $p < 0.07$ ).

**Conclusions:** Using an euglycaemic clamp protocol in obesity class 2 and 3 revealed an effect of the A allele (risk allele) of FTO SNP rs9939609 on the MCR of glucose, indicating a link to insulin resistance.

**Disclosure of Interest:** None declared.

**Keywords:** FTO, Insulin resistance.

#### OR66 MICRONUTRIENTS DEFICIENCIES IN 374 SEVERELY MALNOURISHED ANOREXIA NERVOSA INPATIENTS

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**Rationale:** Anorexia nervosa (AN) is a psychiatric disorder, which can lead to somatic complications. Undernourished AN patients could have micronutrients deficiencies. We aimed to determinate the prevalence and the associated factors of micronutrients deficiencies in the two subtypes of AN (restricting type (AN-R) and binge-eating/purging type (AN-BP)).

**Methods:** A retrospective study of all consecutive malnourished AN adult patients, hospitalized in clinical nutritional unit of Raymond Poincaré University hospital, between 2011 and 2017, was conducted.

**Results:** In all, 374 AN patients (351 (94%) W, 13 (6%) M), age:  $31.3 \pm 12.9$  years, Body Mass Index (BMI):  $12.5 \pm 1.7$  kg/m<sup>2</sup> were included; 121 (32%) patients had AN-BP while 253 (68%) had AN-R subtype. Zinc had the highest deficiency prevalence 64.3%, followed by vitamin D (54.2%), copper (37.1%), selenium (20.5%), vitamin B1 (15%), vitamin B12 (4.7%)

and vitamin B9 (8.9%). Patients with AN-BP type had longer disease duration history, were older, and had a lower left ventricular ejection fraction (LVEF) ( $p < 0.001$ ,  $p = 0.029$ ,  $p = 0.009$ ), when compared with AN-R type patients who, instead, had significantly higher Alanine Aminotransferase (ALT) and Brain Natriuretic Peptide (BNP) levels ( $p < 0.001$ ,  $p < 0.021$ ). In AN-BP subgroup, as compared to AN-R, lower selenium ( $p < 0.001$ ) and vitamin B12 plasma concentration ( $p < 0.036$ ) were observed; whereas lower copper plasma concentration was observed in patients with AN-R type ( $p < 0.022$ ). No significant differences were observed for zinc, vitamin B9, vitamin D, and vitamin B1 concentrations between the two types of AN patients.

**Conclusions:** Malnourished AN patients have many micronutrient deficiencies. Differences between AN subtypes are identified. Micronutrients status should be monitored and supplemented to prevent deficiency related complications and to improve nutritional status. Prospective studies are needed to explore the symptoms and consequences of each deficiency, which can aggravate the prognosis during recovery.

**Disclosure of Interest:** None declared.

#### OR67 TOTAL LYMPHOCYTE COUNT IN CANCER PATIENTS WITH LYMPHOPENIA TREATED WITH INTRAVENOUS VITAMIN C: RESULTS OF AN OBSERVATIONAL STUDY

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**Rationale:** Lymphopenia commonly occurs in cancer patients and predicts poor prognosis. It is caused by radioand chemotherapy, with malnutrition and treatment-related oxidative stress playing key roles in its pathogenesis. Tumour-related morbidity is reported to be associated with reduced plasma ascorbate, which is a key physiological antioxidant and essential factor in immune function.

**Methods:** A prospective observational study was conducted on 48 cancer patients with lymphopenia ( $< 1500/\mu\text{L}$ ) to investigate the total lymphocyte count (TLC) during four weeks of elective adjuvant treatment with intravenous (iv) vitamin C 7.5 g (Pascorbin®7.5 g) once a week. TLC values at baseline (just prior to start of treatment) and after 4 weeks treatment were compared using descriptive statistics.

**Results:** Obesity Grade 1  $n = 4$ .

After 4 weeks iv vitamin C 7.5 g, TLC increased by a mean of  $211/\mu\text{L}$  ( $p = 0.0018$ ). Subgroup analyses showed that, in patients with severe lymphopenia ( $n = 25$ ) (TLC  $< 1000/\mu\text{L}$ ), the increase in TLC was greater with a mean rise of  $368/\mu\text{L}$  ( $p = 0.0004$ ), than in patients ( $n = 23$ ) with an initial TLC of 1000–1500 (mean rise of  $40/\mu\text{L}$ ) ( $p = 0.6105$ ). TLC increased by at least  $240/\mu\text{L}$  in half of the patients with severe lymphopenia and by more than  $610/\mu\text{L}$  in 25% of patient.

Nutrition status	Lymphocytes before therapy mean [cells/ $\mu$ L]	Lymphocytes after therapy mean [cells/ $\mu$ L]	Difference in Lymphocytes mean [cells/ $\mu$ L]
Normal = 0	—	—	—
Risk of malnutrition n = 10	1046.9	1334.0	287.1
Mild malnutrition n = 3	1270.0	1096.7	–173.3a
Moderate malnutrition n = 17	846.5	1013.5	167.1
Severe malnutrition n = 12	774.2	1013.3	239.2
Overweight n = 2	615.0	1620.0	1005.0
Obesity Grade 1 n = 4	1025.0	1035.0	10.0
Valid data	48	48	48
Missing data	0	0.0	0

**Conclusions:** Our data indicate that iv high-dose vitamin C treatment increases TLC, which strongly implies improvement of immune function, especially in patients with severe lymphopenia. Appropriately-powered, randomized, placebo-controlled trials of iv high-dose vitamin C are now needed to define more precisely its role in the treatment of cancer-related lymphopenia and how this impacts on the patients' clinical prognosis.

**Disclosure of Interest:** None declared.

#### OR68

##### EFFECTS OF A MICRONUTRIENT PACK ON MICRONUTRIENT STATUS, HOMOCYSTEINE LEVEL, OXIDATIVE STRESS BIOMARKERS AND FUNCTIONS IN INSTITUTIONAL OLDER ADULTS: A MULTICENTER RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED STUDY

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**Rationale:** Institutional older adults are at increased risk of micronutrient deficiency (MND) which may lead to serious health burdens. This study aimed to investigate the effects of a micronutrient pack on micronutrient status and functions in institutional older adults.

**Methods:** In this randomized, placebo-controlled trial, 98 older adults aged 65~100 years were enrolled and assigned to either intervention group or control group (n=49 each), with either a package of micronutrient pack or placebo daily, for three months. Fasting blood samples were collected both at baseline and the end of study to detect the concentrations of micronutrients, homocysteine (Hcy), malondialdehyde (MDA), glutathione peroxidase (GSH-Px) and superoxide dismutase (SOD). The nutritional status, self-care ability, and cognitive function of the subjects were also evaluated by mini-nutritional assessment short-form (MNA-SF), activities of daily living (ADL) and mini-mental state examination (MMSE), respectively. The difference (before and after intervention) between the two groups was compared by independent sample t test or non-parametric test.

**Results:** Compared to the control group, concentrations of serum folate ( $21.1 \pm 1.6$  vs  $0.6 \pm 0.5$  nmol/L), vitamin B<sub>1</sub> ( $3.4 \pm 0.4$  vs  $-0.2 \pm 0.3$  nmol/L), vitamin B<sub>2</sub> ( $11.5 \pm 3.3$  vs  $2.3 \pm 1.4$  nmol/L), vitamin B<sub>12</sub> ( $128.8 \pm 34.8$  vs  $13.3 \pm 16.0$  pmol/L), 25-hydroxyvitamin D ( $17.8 \pm 1.3$  vs  $-0.8 \pm 0.5$  ng/mL) and plasma zinc ( $0.6 \pm 1.8$  vs  $-9.6 \pm 1.9$   $\mu$ mol/L) significantly increased in the intervention group over 3-month supplementation (all  $P < 0.05$ ). Moreover, plasma Hcy ( $-4.9 \pm 6.9$  vs  $3.2 \pm 6.2$   $\mu$ mol/L,  $P < 0.001$ ) and serum MDA ( $-1.3 \pm 2.7$  vs  $0.6 \pm 2.3$  nmol/mL,  $P = 0.001$ ) levels were remarkably reduced, and the activities of serum GSH-Px ( $1.4 \pm 1.8$  vs  $0.3 \pm 1.0$  ng/mL,  $P = 0.003$ ) and plasma SOD ( $30.0 \pm 35.6$  vs  $-0.8 \pm 26.6$  U/mL,  $P < 0.001$ ) were both increased in the intervention group than that of the control group. Further, improvements in MNA-SF ( $1.1 \pm 2.1$  vs  $2.1 \pm 1.7$ ), ADL ( $-3.8 \pm 12.6$  vs  $2.6 \pm 10.4$ ) and MMSE ( $-0.2 \pm 2.5$  vs  $1.2 \pm 3.0$ ) scores in intervention group were also observed (all  $P < 0.05$ ).

**Conclusions:** The 3-month supplementation of the micronutrient pack ameliorated MND, enhanced antioxidative capacities, and may confer advantageous effect on ADLs and global cognitive function in institutional older adults.

**Disclosure of Interest:** None declared.







## Poster tours

## Critical care/Liver and gastrointestinal tract/Perioperative care

### PT01.1

#### THE EFFECTS OF APPLYING GASTRIC RESIDUAL VOLUME MANAGEMENT PROTOCOL (GRVMP) IN CRITICALLY ILL PATIENTS

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**Rationale:** Early enteral nutrition (EN) has a positive effect on progress and prognosis by increasing the nutritional supply of critically ill patients. Gastric residual volume (GRV) is a frequently used in nursing practice because it is relatively easy and cost effective to evaluate gastrointestinal (GI) dysfunction at the early stage of EN in critically ill patients.

The purpose of this study was to develop the Residual Gastric Volume Management Protocol (GRVMP) for improving GI function and to evaluate the effects of GRVMP in patients with critical illness.

**Methods:** This study was conducted in two stages. The first stage was to develop GRVMP based on the Manual for Guideline Adaptation version 2.0 by the National Evidence-based Healthcare Collaborating Agency.

The second stage was designed as a quasi-experimental study, which only pretest was practiced to control group and after The GRVMP only posttest was practiced to experimental group.

The subjects were patients admitted to the ICU of G hospital in Seoul and were eligible for inclusion criteria. A total of 75 participants were enrolled in the study, of which 45 were received enteral nutrition. Data were collected from July 2016 to September 2017. EN performance, EN start date, Achievement Rate of Target Nutritional Requirement (ARTNR), GI dysfunction, and aspiration pneumonia were measured. Data were analyzed using the independent t test, the Mann-Whitney U test, and the  $\chi^2$  test through the R 4.3.2 statistical program.

**Results:** GRVMP included the maximum capacity of GRV, assessment frequency and the treatment method of GRV, and included specific nursing intervention when GRV limit was exceeded.

GRV assessment frequency was measured every 4 hours for the first 48 hours and then every 6 hours thereafter.

The maximum capacity of GRV was 250 ml and less than 250 ml of volume was returned using the aseptic technique and over 250 ml was discarded. In other words, if the GRV exceeded 250 ml, the nursing intervention was carried out according to the four specific steps.

The results of the GRVMP application showed that the EN Performance was 17(40%) in the control group and 28(85%) in the experimental group ( $p=0.0001$ ). EN was started within 72 hours in 9(21%) of the control group and 19(58%) of the experimental group ( $p=0.00003$ ). On the 7th day, ARTNR was 0% [0.0, 46.5] in the control group and 54%

[31.0, 80.0] in the experimental group ( $p=0.0001$ ), which was significantly improved.

There was no significant difference of vomiting, reflux, diarrhea, constipation and abdominal distension.

The incidence of aspiration pneumonia was 2(11.8%) in the control group and 0(0%) in the experimental group, but it was not significantly different.

**Conclusions:** The application of GRVMP significantly improved the early EN and ARTNR of the critically ill patients and there was not found a negative effect in this study. Rather, it seems that GRVMP may be the way to detect early and prevent the negative effects of EN in patients with critical illness.

**Disclosure of Interest:** None declared.

### PT01.2

#### ZP7570: A NOVEL GLP-1/GLP-2 DUAL ACTING PEPTIDE WITH POTENTIAL AS THE NEXT GENERATION THERAPY FOR SHORT BOWEL SYNDROME

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**Rationale:** The GLP-2 analog teduglutide is approved for use in adult short bowel syndrome (SBS), whilst GLP-1 analogs exendin-4 and liraglutide have shown positive effects in clinical studies in SBS patients. We are developing a long-acting dual GLP-1/GLP-2 agonist peptide ZP7570, with the potential to improve the current standard treatment for SBS.

**Methods:** C57BL/6 mice ( $n=6$ ) were dosed SC once daily (QD) with vehicle, ZP7570 (6 and 250 nmol/kg, QD), liraglutide (50 nmol/kg, BID) or teduglutide (250 nmol/kg, BID) for 3 days. An oral glucose tolerance test was performed on day 1 and at sacrifice (day 4), the intestinal tract was weighed. Wistar rats ( $n=4-6$ / group) were dosed SC (QD) with vehicle or ZP7570 (0.1–225 nmol/kg, QD) for 14 days. Gastric emptying (GE) and intestinal transit (IT) were determined using a barium sulfate assay, and small and large intestines weighed.

**Results:** In mice, acute dosing with ZP7570 significantly reduced blood glucose levels at all time-points prior to and after glucose administration, with similar effects to liraglutide. Moreover, ZP7570 significantly increased total intestinal weight vs vehicle group. After 14 days of dosing in rats, ZP7570 dose-dependently inhibited IT, but had no effect on GE. In addition, ZP7570 significantly increased small intestinal mass and intestinal length, but only induced a slight increase in large intestinal mass.

**Conclusions:** ZP7570 has potent intestinotrophic and intestinal transit effects in rodents, effects expected to result in increased absorption of fluid and nutrients in SBS patients. Furthermore, due to its GLP-1 agonist activity ZP7570 is also expected to protect against hyperglycemia and liver injury, which are both frequently associated with parenteral support. These findings warrant clinical evaluation of ZP7570 as a future treatment for SBS.

**Disclosure of Interest:** J. Skarbaliene Shareholder of: Zealand Pharma A/S, Other: employe, W. Russell: None declared, J. Griffin: None declared, P.-O. Eriksson: None declared.

### PT01.3 SHORT-TERM PREOPERATIVE SMOKING CESSATION WITHIN AN ENHANCED-RECOVERY PROGRAMME REDUCES PERIOPERATIVE RISKS TO BASELINE: A STUDY IN 1,517 CONSECUTIVE PATIENTS

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**Rationale:** Randomised trials have demonstrated that smoking cessation in the weeks before elective major orthopaedic and general surgery reduces postoperative morbidity. We hypothesised that smoking cessation before colorectal surgery reduces morbidity to a level similar to that of non-smokers.

**Methods:** Consecutive patients undergoing elective major colorectal surgery in an enhanced-recovery programme 2011–2018 were prospectively studied using an international perioperative registry. Patients with unknown smoking status were excluded. The enhanced-recovery programme incorporated limited smoking cessation support. The effect of smoking cessation on postoperative outcomes was assessed using univariable and multivariable regression. Medians (range) reported.

**Results:** 1517 patients were included, 1348 non-smokers, 117 smokers and 52 who had stopped smoking within 2–8 weeks before surgery. The proportions of patients with a complication (Clavien-Dindo I-IV) within 30 days differed between groups, 27.2 vs 40.2 vs 23.1% (P 0.0083) These differences persisted (P 0.032) when correcting for confounders (body mass index, surgical approach, duration of surgery and fluid administration). Length of hospital stay also differed between groups at 6 (4–9) vs 7 (5–12) vs 6.5 (4–10) days (P=0.0322), with differences persisting when correcting for confounders.

**Conclusions:** In this large, consecutive single-centre series, patients who stopped smoking before surgery had not only improved outcomes compared to smokers, but outcomes comparable to those of non-smokers. These findings strengthen the case for preoperative intensive smoking cessation support.

**Disclosure of Interest:** None declared.

### PT01.4 EFFICIENCY OF EARLY ENTERAL NUTRITION WITH AUGMENTED PROTEIN-CALORIC VALUE IN THE COMPLEX OF INTENSIVE CARE THERAPY OF POLYTRAUMA PATIENTS

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**Rationale:** Protein-energy homeostasis along with proper oxygenation forms the basis of combating a critical state. Our goal was to evaluate the effectiveness of early enteral nutrition (EEN) with use of the PEP uP protocol (Enhanced Protein-Energy Provision via the Enteral Route in Critical ill Patients) in the complex of intensive care therapy for polytrauma patients.

**Methods:** The study included 40 adult polytrauma-patients, treated in the Lviv Emergency Hospital with moderate (60%) and severe (40%) polytrauma according to the ISS (Injury severity score). The patients arrived at the hospital within 30 min after the accident, the average age was 42.1 ± 2.3 years. The levels of total protein were determined on admission, on the 5th day of treatment and throughout the days of artificial ventilation. These indicators were compared between an experimental group of 20 patients who were put early on EEN according to the PEP uP protocol and a control group in which nutritional support was conducted according to the European guidelines for clinical nutrition, using standard mixtures.

**Results:** The experimental group received a specialized protein-saturated semi-elemental peptide-based mixture, that contains 1,5 kcal per 1 ml with an initial feeding rate from 60 ml/h to 80 ml/h. The maximum residual volume of the stomach was 250 ml with systematic usage of prokinetics. After 5–7 days the nutritional therapy was switched to a standard regimen. The stabilization of hemodynamics and oxygenation was achieved within 12–24 hours by Intensive care therapy and early surgical intervention. The blood protein level in the experimental group on admission was 58.0 ± 1.0 g/l, in the control group 58.2 ± 1.6 g/l (p > 0.5), on the 5<sup>th</sup> day – 60.0 ± 1.0 and 51.5 ± 0.8 g/l (p < 0.001) respectively. The total duration of artificial ventilation in the experimental group was on average shorter by 3.4 days and amounted to 8.7 ± 2.0 days as opposed to the control group 12.1 ± 1.8 days (p > 0.2).

**Conclusions:** In comparison with the control group, the usage of enhanced protein-caloric provision according to the PEP uP protocol achieved a normalization in the protein levels on the 5th day of treatment and reduced the total days of mechanical ventilation by an average of 3.4 days. The protein-energy deficit of patients switched to standard, balanced mixtures for enteral nutrition was associated with an exacerbation of hypoproteinaemia and longer durations of mechanical ventilation.

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**Disclosure of Interest:** None declared.

### PT01.5 ASSOCIATION BETWEEN HAEMODYNAMIC PARAMETERS AND ENTERAL NUTRITION OUTCOMES IN SEPTIC SHOCK PATIENTS: PRELIMINARY RESULTS

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**Rationale:** Provide enteral nutrition (EN) to patients who are haemodynamically compromised still an issue up to debate. The aim of this study was to evaluate the association between haemodynamic parameters and nutrition therapy (NT) outcomes in septic shock patients.

**Methods:** Prospective study carried out in a tertiary teaching hospital. Consecutive adult patients with septic shock admitted to ICU were included. Mean arterial pressure (MAP), heart rate (HR), urine output (UO), lactate, skin mottling (mottling score from 0–5), capillary refill time (CRT), central-to-toe temperature gradient (TG) were evaluated in bedside in the admission (H0), 12-hours (H1), 24-hours (H2) and 48-hours (H3). Patients were stratified into two groups according to NT outcomes [NTS (success): start EN ≤ 48-hours and achieve ≥ 20 Kcal/kg or 11 kcal/kg body weight when obese in the first ICU week; or NTF (failure) when those parameters were not achieved]. Statistical analysis for independent samples, generalized linear model and generalized estimation equations model were performed.

**Results:** During a 12-month period, 106 septic shock patients were included, 23 were excluded (death in <48-hours) and 83 were analyzed. At H0, SAPS 3 was 74 ± 11, SOFA score 8(6–10) and age 64 (55–71) years. Regarding NT groups, 53(63.8%) achieved NT success and 30(36.2%) NT failure. At H1, NTF showed more severe mottling (MS 4–5) while NTS more absence or modest mottling (MS 0–1) [4(13.3%)



vs 1(1.9%); (18(60.0%) vs 43(81.1%),  $p=0.045$ ], and higher lactate levels [(3.15(1.77–6.77) vs 1.40(1.0–2.32),  $p=0.005$ ]. At H1 more TG was observed in NTF [22(73.3%) vs 21(39.6%),  $p=0.03$ ] and CRT threshold  $\geq 3$  seconds [21(70.0%) vs 22(41.5%),  $p=0.013$ ] than in NTS. No differences for MAP, HR, UO at H1 between groups were found. At H1, hiperlactatemia [RR 2.8 95%CI (1.5,5.3),  $p < 0.001$ ], TG [RR 2.6 95%CI (1.3,5.2),  $p=0.006$ ], CRT threshold  $\geq 3$  seconds [RR 2.2 95%CI (1.1,4.3),  $p=0.016$ ], MS [0–1 RR 1; 4–5 RR 2.75 95%CI (1.53–4.95),  $p=0.001$ ] were associated with NT failure. Lower MS was observed in NT success group in H1, H2 and H3 while no reductions in MS were observed in NT failure group.

**Conclusions:** Preliminary results suggest association between early improvement in haemodynamic parameters and success in NT. This could support the recommendation to start NT after hemodynamic and perfusion goals are achieved. An enlargement of the study population is needed to clarify this results.

**Disclosure of Interest:** None declared.

#### PT01.6

### SKETETAL MUSCLE INDEX AT ICU (INTENSIVE CARE UNIT) ADMISSION IS VALID FOR PREDICTING THE PROGRESSION OF ICU-ACQUIRED WEAKNESS (ICU-AW) FOR SEPTIC PATIENTS

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**Rationale:** Early detection of intensive care unit-acquired weakness (ICU-AW) is necessary for preventing muscle weakness in ICU patients. Medical research council (MRC) score  $< 48$  has been generally used for ICU-AW diagnosis. On the other hand, skeletal muscle index (SMI,  $\text{cm}^2/\text{m}^2$ ) calculated by height and skeletal muscle area at the level of the third lumbar vertebra, measured by computed tomography, is recently used for the assessment of sarcopenia. In this study, we examined whether SMI at ICU admission is valid for predicting ICU-AW for septic ICU patients.

**Methods:** We examined septic ICU patients who admitted Niigata University Hospital ICU during 2012–2017 under mechanical ventilation. Patients were retrospectively divided into two groups by the MRC score at ICU discharge: Group AW contained the patients of ICU-AW diagnosed by MRC  $< 48$ , and Group N the contained patients of non-ICU-AW. Clinicopathological factors at ICU admission such as age, gender, underlying disease, body mass index (BMI), APACHE II score, Barthel index, and SMI, were compared between the two groups. The statistical analyses were performed by Mann-Whitney U test, Fisher's exact test, ROC analysis and multivariate analysis. The statistical significance was defined as  $P < 0.05$ .

**Results:** A total of 31 septic patients were examined; 23 patients in Group Aw and 8 patients in Group N. There was no significant difference between the two groups in age, BMI, APACHE II score and Barthel index, however, female patients were significantly frequent in Group Aw ( $P < 0.05$ ). SMI was significantly low in in Group Aw compared with Group N ( $P < 0.05$ ). ROC analysis revealed that the cut-off value of SMI for predicting ICU-AW was 44.1, and multivariate analysis showed that low SMI was a significant factors predicting ICU-AW (relative risk 2.262, 95% confidence interval 1.451–63.5000,  $P < 0.05$ ).

**Conclusions:** Our results show that SMI measurement at ICU admission might be valid for predicting ICU-AW progression for septic patients.

**Disclosure of Interest:** None declared.

## Geriatrics/Nutrition and chronic disease/ Nutritional epidemiology

#### PT02.1

### POORER MEMORY IS RELATED TO POORER ODOR DISCRIMINATION AND IDENTIFICATION IN MILD COGNITIVE IMPAIRMENT AND ALZHEIMER'S DISEASE: THE NUDAD PROJECT

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**Rationale:** Lower olfactory scores, especially on identification, is reported in patients with mild cognitive impairment (MCI) and Alzheimer's disease (AD). It is not clear whether this is associated with poorer cognition or AD pathology. We compared olfactory function of patients with MCI and AD with controls, and studied associations of cognitive domains and AD biomarkers with olfactory function.

**Methods:** We included 22 patients with MCI (age  $70 \pm 7$  y, 27%Female), 30 with AD ( $70 \pm 8$  y, 53%F) and 40 controls ( $63 \pm 7$  y, 55%F). We assessed olfactory threshold, discrimination and identification. Age, gender and education adjusted ANOVAs, and linear regression analyses of cognitive domains (memory, attention, executive function, language and visuospatial ability) or AD biomarkers ( $A\beta_{42}$ , tau and p-tau) with olfactory function were used.

**Results:** Patients with MCI and AD scored lower on discrimination and identification than controls (9.0 and 9.5 vs 11.6; 9.5 and 9.2 vs 11.6), but not on threshold (6.9 and 5.9 vs 7.1). Poorer memory, but no other domain, was associated with poorer discrimination and identification (Table 1). There were no associations between AD biomarkers and olfactory function.

**Table 1**

Associations of cognitive domains with olfactory function.

	Threshold	Discrimination	Identification
Memory	0.62 (–0.16; 1.39)	<b>1.19 (0.57; 1.82)</b>	<b>1.29 (0.60; 2.01)</b>
Attention	–0.42 (–1.10; 0.26)	0.14 (–0.46; 0.74)	0.10 (–0.60; 0.80)
Executive function	–0.43 (–1.60; 0.74)	0.20 (–0.78; 1.18)	0.86 (–0.21; 1.92)
Language	–0.31 (–1.31; 0.69)	0.31 (–0.57; 1.19)	0.55 (–0.45; 1.55)
Visuospatial ability	–0.17 (–1.03; 0.67)	–0.50 (–1.22; 0.22)	–0.24 (–1.02; 0.53)

Data presented as  $\beta$  (95% CI).

**Conclusions:** Patients with patients with MCI and AD do not have a lower sensitivity for detecting odors but difficulties in discriminating and identifying odors, which is likely a consequence of poorer memory rather than a direct result of AD pathology.

**Disclosure of Interest:** None declared.

#### PT02.2

### EFFECT OF AGE, STRESS AND PROTEIN SUPPLY ON PLASMA AMINO ACID KINETICS DURING CONTINUOUS ENTERAL NUTRITION

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**Rationale:** As life expectancy rises, an increasingly older population may require surgery with perioperative nutritional management. Little is known about the combined effect of age and stress on the metabolism of amino acids (AA) provided by enteral nutrition (EN). In addition, the respective advantages of whole proteins and protein hydrolysates in EN can be questioned in the context of intestinal ageing. These questions were addressed in aged and adult rats subjected to continuous EN before and after a standardized surgical stress.

**Methods:** Thirty-two 5-month or 21-month-old male SD rats were used. After a gastrotomy and the insertion of a jugular vein catheter and a one-week recovery, the animals were enterally fed (317 kJ/24 h and 4.15 g protein/24 h) whole proteins or a protein hydrolysate (Sondalis HP or Peptamen HN, Nestle Health Science respectively) for 24 hours before (healthy state) and 18 hours after a standardized laparotomy (surgical stress). Blood samples were repeatedly collected for the measurement of plasma AA and calculation of enrichment and incremental area under the curve (iAUC) during each EN period. Statistical analysis: three factor (protein source, age, and stress) ANOVA; significance:  $p < 0.05$ .

**Results:** Whatever the conditions, EN was associated with a significant plasma enrichment (50 to 150  $\mu\text{mol/l}$ ;  $p < 0.001$ ) in Ala, Thr, Lys and Pro, and a decrease ( $-80 \mu\text{mol/l}$ ) in Gly ( $p < 0.01$ ). Individual AA iAUCs were strongly affected by the AA composition of the protein supplied (increased AA utilisation with protein hydrolysate) and by surgical stress (increased utilisation of most AAs but decreased branched-chain AA utilisation). Aging was only associated with higher Tyr and Thr iAUC ( $p < 0.001$ ), and lower Gln iAUC ( $p < 0.01$ ). There was no interaction between age and surgical stress.

**Conclusions:** Plasma AA availability during EN is determined by the nature of the protein supply and the existence of stress. The effects of aging appear to be very limited. Aging does not appear to negatively affect postoperative AA availability whether from a protein hydrolysate or whole proteins.

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### PT02.3

#### PROTEIN INTAKE IN CANCEROLOGY: DOES IT LIMIT MALNUTRITION OR PROMOTE TUMOR GROWTH?

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**Rationale:** The amount of protein intake in cancer is a controversial issue. Indeed, a too high protein intake could promote tumor growth, whereas a hypo protein intake would promote malnutrition and cachexia (1,2). To date, the majority of the data are in a cancer-only model, but there are no clinical or experimental studies to resolve this issue in a model of tumor-bearing rats receiving chemotherapy. The objective was to evaluate the influence of different protein intakes in an animal model of cancer associated of chemotherapy.

**Methods:** Seventy-eight female rats (Fisher 344, 12 weeks old) were divided into 6 groups: a control group (C,  $n = 8$ ) of healthy rats with a standard diet (100% of protein requirements) and 5 groups (K,  $n = 14$ ) with a diet with different amounts of protein (50%, 75%, 100%, 150% and 200% of protein requirements), which received a cancer (Ward colon tumour injected subcutaneously) and chemotherapy included two cycles, one week apart, each consisting of one injection of irinotecan (CPT-11, 50 mg/kg) and one of 5-Fluorouracil (5-FU, 50 mg/kg) the day after (3). Food intake, animal body weight and tumour size were measured daily. The day after the last injection of chemotherapy, rats were killed, the organs were weighed and body composition

determined. Protein synthesis and content were evaluated in the muscles (*EDL*, *tibialis*, *soleus*) and tumor. The protocol has been validated by the ethics committee (APAFIS#11492).

**Results:** Cancer led to a weight loss of the animals ( $C = 171.5 \pm 2.6 \text{ g}$  vs  $K = 150.8 \pm 2.4 \text{ g}$  ( $p < 0.005$ )). Similarly at the tissue level, cancer induced atrophy of the liver ( $p < 0.005$ ), thymus ( $p < 0.005$ ), lean body mass ( $p < 0.005$ ) and fat mass ( $p < 0.005$ ). Surprisingly, these alterations in body composition are not affected by either hyper-protein or hypo-protein intakes. In addition, protein synthesis and protein content in the muscles and tumor were not different between the groups. Tumor growth was not affected by the level of protein intake.

**Conclusions:** Initial data suggest surprisingly that neither nutritional status or tumour growth appears to be modulated by the level of protein intake. Such results may to be confirmed in humans.

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**Disclosure of Interest:** None declared.

### PT02.4

#### ASSESSING SKELETAL MUSCLE MASS WITH ULTRASOUND IN PATIENTS WITH SYSTEMIC SCLEROSIS

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**Rationale:** Patients with systemic sclerosis (SSc) have increased risk for decreased skeletal muscle mass due to inflammation, malnutrition, low physical activity status and musculoskeletal involvement. The role of ultrasonography (USG), which is increasingly used in rheumatology practice, in evaluating muscle mass in this patient group is unknown. The aim of this study is determine to assess of the utility of USG in the evaluation of muscle mass in SSc

**Methods:** 93 SSc patients who were admitted to rheumatology outpatient clinic were included. Appendicular skeletal muscle mass indices (ASMI) of patients was calculated using bioelectric impedance analysis (BIA)<sup>1</sup>. Decreased muscle mass was defined as an ASMI below 7.26  $\text{kg/m}^2$  for men and 5.50  $\text{kg/m}^2$  for women. The severity of the gastrointestinal involvement was assessed by the UCLA GIT 2.0 scale and the physical activity status by the International Physical Activity Questionnaire (IPAQ). The presence of malnutrition was determined ESPEN criteria was used to determine the presence of malnutrition. Thicknesses of gastrocnemius, rectus femoris, rectus abdominis, external oblique, internal oblique and transverse abdominis muscles was assessed by USG. Pearson analysis was used to evaluate correlation between ASMI and each muscle thickness. Sensitivity, specificity and predictive values of ultrasonographic cut-off values in predicting decreased muscle mass were determined by ROC analysis.

**Results:** Reduced muscle mass was present in 13 (13.9%) of 93 patients (F/M: 86/7). Demographic and clinical features of patients are summarized in Table 1. Diffuse subset, flexion contracture of hands, history of digital ulcer and malnutrition were more frequently observed in patients with decreased muscle mass ( $p < 0.05$  for all). Ultrasonographic thickness of gastrocnemius, rectus abdominis and internal oblique muscles were also significantly low in this group (Table 2)]. Gastrocnemius thickness showed the highest correlation with ASMI ( $r = 0.513$ ,  $p < 0.001$ ). The cut-off value of 1.47 cm for the thickness of gastrocnemius had 92.3% sensitivity, 58.7% specificity and 97.9% negative predictive value in predicting decreased muscle mass (AUC: 0.846).

**Table 1**  
Demographic, clinical and anthropometric features of SSc patients.

	Normal muscle mass (n = 80)	Decreased muscle mass (n = 13)	p
Female	73 (91.3%)	13 (100.0%)	0.588
Age, years	52.5 (42.6–58.8)	54.1 (35.2–58.7)	0.991
Disease duration, years	10.5 (5.7–15.7)	21.8 (3.3–26.8)	0.148
Diffuse disease	14 (17.5%)	7 (53.8%)	<b>0.004</b>
Interstitial lung disease	41 (51.2%)	10 (76.9%)	0.085
Digital ulcer history	39 (48.8%)	10 (76.9%)	0.059
Flexion contracture of hands	16 (20.0%)	9 (69.2%)	<b>&lt;0.001</b>
CRP, mg/dL	0.40 (0.24–0.70)	0.81 (0.20–1.51)	0.279
Body mass index	25.5 (22.2–29.0)	18.8 (17.6–20.8)	<b>&lt;0.001</b>
ASMI, kg/m <sup>2</sup>	6.9 (6.2–7.8)	4.9 (4.7–5.3)	<b>&lt;0.001</b>
UCLA GIT 2.0 score	0.19 (0.04–0.36)	0.08 (0.05–0.27)	0.526
Malnutrition	7 (8.8%)	8 (61.5%)	<b>&lt;0.001</b>
Physical activity			
Low/moderate	65 (81.2%)	13 (100.0%)	
High	15 (18.7%)	–	0.118
Glucocorticosteroids			
No/ low dose (<7.5 mg/day)	76 (95.0%)	12 (92.3%)	0.537
Moderate/high dose (≥7.5 mg/day)	4 (5.0%)	1 (7.7%)	

CRP; C-reactive protein, ASMI; appendicular skeletal muscle mass index.

**Conclusions:** Measurement of gastrocnemius thickness by USG can be used as screening test due to its high sensitivity and negative predictive value for detecting decreased muscle mass in SSc patients.

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**Disclosure of Interest:** None declared.

#### PT02.5 HOME PARENTERAL NUTRITION IN CZECH REPUBLIC: ANALYSIS FROM THE NATIONAL HPN REGISTRY 2007–2018

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**Rationale:** The updated analysis and stratification of patients on home parenteral nutrition (HPN) is presented with the aim to demonstrate the trends in occurrence of complications among patients on total HPN in recent years.

**Methods:** Retrospective data from HPN National Registry was analysed for the time period 2007–2018. Time-to-event analyses were performed for catheter related sepsis (CRS), catheter occlusion, and thrombotic complications using the competing-risks regression (Fine and Gray) model and expressed as hazard ratio (HR). Other data is presented as median or mean with 95% CI (p < 0.05 was considered significant).

**Results:** Out of 1008 records, short bowel syndrome was present in 349 patients (35.2%), intestinal obstruction in 201 patients (20.3%), and malabsorption in 114 patients (11.4%). The rest of 344 patients (34.1%) was split among fistulas, anorexia, dysphagia, or unspecified. The majority of SBS were type I (53.1%) and II (18.8%), mean length of residual bowel was 88.1 cm (0–400 cm). 78.3% HPN patients were mobile

for a substantial part of the day, and 148 (14.7%) out of 549 economically potent ones were economically active. A tunnelled Hickman catheter was used in 527 patients (52.3%). More than 50% patients received commercially prepared bags. 2/3 of patients were administered one bag per day, seven days a week. The sepsis ratio per 1000 catheter days decreased from 0.79 in 2013 to 0.20 in 2018. In 2018, the catheter occlusions ratio was 0.134 per 1000 catheter days, and thrombotic complications ratio was 0.119. 44.6% of all patients terminated HPN (weaning or death) within the first year. 14.2% of patients are categorised as life-long HPN dependent. Prevalence of metabolic bone disease is 16.9%, and prevalence of liver disease (PNALD) is 33.1%.

**Conclusions:** Prevalence of HPN patients in the Czech Republic has been stable in the past five years. Majority of patients are expected to terminate HPN within the first year. Risk of CRS decreased in the past five years and remains very low, while catheter occlusion and thrombotic complications show the opposite trend.

**Disclosure of Interest:** None declared.

#### PT02.6 THE ASSOCIATION OF PROTEIN INTAKE AND LIKELIHOOD OF FUNCTIONAL LIMITATIONS 14 YEARS LATER IN OLDER MEN

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**Rationale:** Low protein intake has been linked to worse functional status, but the long-term association between daily protein intake and development of functional limitations in older adults is not described.

**Methods:** At the baseline visit in Osteoporotic Fractures in Men (MrOS) Study (2000–2), men completed a food frequency questionnaire, from which low protein intake (analyzed as <0.8 grams/kilogram body weight/day) and energy intake were estimated. At baseline and via questionnaires 14–16 years later, men were asked about any difficulty with activities of daily living (ADL, tasks: bathe, transfer, toilet, dress, eat), instrumental ADLs (IADL, tasks: prepare meals, manage medications, manage money, shop, drive, housework) and mobility (tasks: walk 2–3 blocks, climb 10 stairs). In men free from limitation at baseline, we used logistic regression models to estimate the likelihood of limitation at follow-up by protein intake (low vs. high) and energy intake (tertiles: low (referent), medium, high). Multivariate models were first adjusted for age, education, alcohol use, smoking, marital status, activity and race, and protein models then further adjusted for energy intake. Due to long-term follow-up we also assessed likelihood of survival.

**Results:** In multivariate models without consideration of energy intake, there was no evidence of an association between low protein intake and likelihood of limitation (Table). However, after adjustment for energy intake, men with lower protein intake were more likely to report ADL or mobility limitation at follow-up. There was no significant association of energy intake at baseline and subsequent limitations (p > 0.05 for all outcomes in multivariate models). Those with lower protein intake at baseline were also less likely to survive through follow-up 14–16 years later.



**Table**

Low protein intake (<0.8 grams /kilogram body weight/day) and its association (odds ratio, 95% CI) limitations in ADLs, IADLs and mobility tasks 14–16 years later in older men.

	Multivariate model	Multivariate plus energy intake
ADL limitation (N = 306 of 1006 at risk)	1.24 (0.93, 1.65)	1.88 (1.29, 2.74)
IADL limitation (N = 401 of 939 at risk)	0.87 (0.66, 1.16)	1.22 (0.85, 1.75)
Mobility limitation (N = 362 of 958 at risk)	1.12 (0.85, 1.48)	1.62 (1.12, 2.34)

**Conclusions:** Amongst men with similar energy intake, those with lower protein intake are more likely to report ADL or mobility limitations many years later than were men with higher protein intake.

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## Nutrition and cancer/Nutritional assessment/ Qualitative design studies

**PT03.01****PATIENT SOURCES OF DIETARY AND NUTRITIONAL INFORMATION AFTER A CANCER DIAGNOSIS**

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**Rationale:** Nutrition-related problems in cancer are under-recognised and under-treated. Few healthcare professionals discuss nutrition/diet with cancer patients. Consequently, patients may seek information from other sources. Information sources and types of advice accessed are unknown. This study aimed to determine the source and type of nutritional/dietary information accessed by cancer patients prior to first dietetic assessment and the degree to which advice was followed.

**Methods:** This prospective, multi-center, cross-sectional observational study recruited consecutive cancer patients at seven tertiary centers. During initial dietetic assessment, a dietitian determined all nutritional/dietary information accessed since cancer diagnosis.

**Results:** 74 participants (50% female) with a median age 60 (range 23–80) were recruited. Forty percent reported weight loss of 5% or greater. The median time from diagnosis to initial dietetic assessment was 3 months (range 0–242). Patients obtained advice from a variety of sources (average 1.6 sources per patient) prior to dietetic referral. In rank order these were; 1) family or friend (n=31), 2) health professional (n=24), 3) online forums or websites (n=16) and 4) media (n=14). Twenty-one (28%) received no dietary advice prior to referral. The most frequent advice related to avoidance of certain foods; particularly sugar, dairy and meat. The consumption of fruit, vegetables, protein, juices and wholegrain was commonly advised.

Fifty-one percent followed advice and 4% partially followed it. Many expressed disappointment at not having a dietetics referral earlier and identified the need for “good information early.”

**Conclusions:**

1. The majority of dietary and nutritional advice prior to dietetic referral came from friends, family, media and online forums and websites.
2. In a minority, dietary advice was provided by health professionals prior to dietetic referral.
3. Most advice related to the avoidance and/or promotion of particular foods.
4. Cancer patients want dietary advice from dietitians at diagnosis to prevent unnecessary avoidance of certain foods and to reduce the risk of unintentional weight loss.

**Disclosure of Interest:** None declared.

**PT03.02****DOES MALNUTRITION INFLUENCE HOSPITAL REIMBURSEMENT? A CALL FOR DIAGNOSIS AND CODING**

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**Rationale:** In the hospital setting, malnutrition is highly prevalent and entails significant morbidity and mortality, but it is frequently undiagnosed and underreported. Since malnutrition contributes to a poorer prognosis, its diagnosis and documentation are essential not only to improve patient care but also to correctly report associated hospitalization costs (HC), allowing hospitals to obtain the appropriate reimbursement. Therefore, we aimed to determine how malnutrition diagnosis in an internal medicine ward setting influences potential hospital reimbursement.

**Methods:** Patients admitted to the internal medicine ward of CHMA, EPE were screened by Nutritional Risk Screening 2002 (NRS 2002), and patients classified as at “risk for malnutrition” were assessed by the Patient-Generated Subjective Global Assessment (PG-SGA). For each patient, medical coders simulated coding taking into account the malnutrition diagnosis by PG-SGA, and compared it to the real coding as retrieved from the medical records. For the coding, the Diagnosis-Related Group and Severity of Illness (SOI) were determined, allowing the calculation of HC according to Portuguese Ministerial Directive number 207/2017. The increase of HC in this subsample was extrapolated to the number of patients admitted during 2018 to obtain the estimated unreported annual HC.

**Results:** Of the participants having malnutrition risk according to NRS 2002 (92/129, 71%), 86% were malnourished. Including malnutrition diagnosis in the coding of malnourished patients increased the level of SOI in 39% of cases, and increased HC for this subsample in €52 K. Extrapolating for the annual HC, total HC reached € 1.3M.

**Conclusions:** Identifying, coding, and recording malnutrition allows inclusion of this highly prevalent diagnosis in medical records, which increases HC. This can improve the potential hospital reimbursement, which could contribute to the economic sustainability of hospitals and, consequently, to the quality of patient care.

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**PT03.03****PERIPHERAL PARENTERAL NUTRITION AND OCCURENCE OF THROMBOPHLEBITIS**

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**Rationale:** Parenteral nutrition (PN) is used to supplement or replace inadequate oral or enteral feeding in hospitalized patients. In nearly half of the patients, peripheral PN (PPN) is associated with thrombophlebitis according literature review.<sup>(1)</sup>

The duration and incidence of thrombophlebitis with patients who receive peripheral parenteral nutrition at the University Hospital Brussel is unclear. Knowledge of complications and use is important for the optimisation of the nutritional therapy.

**Methods:** A observational retrospective study in a tertiary care center covering a period of 3 years (2015–2018) was conducted. All patients on peripheral parenteral nutrition are included (n = 343), the osmolarity of the parenteral nutrition deaty-to-use bag is 760 mosm/l. A database is developed and the medical records are thorough analysed. Treatment duration, age, occurrence of thrombophlebitis, flow rate, osmolarity and important co-medications were recorded. Data are given as means ± SD.

**Results:** 343 patients with peripheral parenteral nutrition PPN were studied, aged 63 ± 22 years, who received 367 PN therapies via the peripheral route. A PPN therapy was administered for 5.7 ± 6.1 days. Thrombophlebitis (TP) occurred in 5% of the therapies on PPN. Patients who developed thrombophlebitis received a peripheral PN therapy for 11 ± 6.2 days. Under 18 years there was an incidence of 5% for TP and PPN. Between 18–50 years there was no TP for 48 therapies. Between 51 and 97 years there was an incidence 5.3% TP with a treatment duration of 11 ± 6 days.

**Conclusions:** A substantial proportion of our hospitalized patients receive PN via a peripheral vein. In contrast with data from the literature, peripheral PN-associated incidence of thrombophlebitis was low. The risk to develop thrombophlebitis increased with prolonged treatment. TP occurred more in patients older than 50 years, and PPN duration was longer than in other age categories.

**Reference**

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**PT03.04****AN ENHANCED NUTRITIONAL SUPPORT PATHWAY INCLUDING EXTENDED PREOPERATIVE AND HOME ENTERAL NUTRITION IS SAFE, FEASIBLE AND MAY BENEFIT PATIENTS UNDERGOING ENHANCED RECOVERY AFTER ESOPHAGECTOMY: A PILOT RANDOMIZED CLINICAL TRIAL**

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**Rationale:** Perioperative malnutrition is common seen in esophageal cancer patients. This pilot RCT aims to evaluate the safety, feasibility,

and effect of an enhanced nutritional support pathway for enhanced recovery after esophagectomy.

**Methods:** Patients who would undergoing enhanced recovery after esophagectomy and met the inclusion criteria were randomly divided into conventional nutrition support group or enhanced nutrition support group, a week before surgery. Both groups underwent the same ERAS program of esophagectomy basing on the guidelines<sup>[1,2]</sup>, except the nutrition support program. Standard nutritional support basing on the guidelines<sup>[3,4]</sup> was implemented for the conventional nutrition group. In addition, extended preoperative nutrition support and one month home enteral nutrition (HEN) were implemented for the enhanced nutrition group. The safety, feasibility and compliance of the enhanced nutrition support were evaluated and the perioperative outcomes, nutritional status, and quality of life (QoL) were assessed at preoperative day, POD7 and POD30. This study was registered (ChiCTR1800015951) and approved by the ethics committee of Jinling Hospital.

**Results:** The nutrition schedule compliance was 90.63% (29/32) and 87.10% (27/31) in the enhanced nutrition group and conventional nutrition group respectively, exclusive of five patients lost to follow-up. No severe nutrition-related complications occurred. The intention-to-treat analysis of the 63 randomized patients showed that there was no significant difference in baseline characteristics. The weight and BMI loss of patients in the enhanced nutrition group were obviously decreased and the LBM, ASMI was significantly higher at POD30. EORTC QLQ-C30 scores revealed that the enhanced nutrition support improved QoL in physical function (75.96 ± 9.32 vs. 68.46 ± 7.18, P < 0.01) and fatigue symptom (41.86 ± 9.64 vs. 49.19 ± 10.72, P < 0.01) compared to the conventional nutrition support.

**Table 1**

Nutritional outcomes.

	Conventional nutritional support group (n = 31)		Enhanced nutritional support group (n = 32)		P value
	Mean ± SD		Mean ± SD		
Weight (kg)	Mean ± SD		Mean ± SD		
POD7-Preop	-0.61 ± 1.73		-0.67 ± 1.58		0.886
POD30-Preop	-4.19 ± 3.01		-2.11 ± 2.19		0.003
BMI (kg/m <sup>2</sup> )	Mean ± SD		Mean ± SD		
POD7-Preop	-0.19 ± 0.62		-0.20 ± 0.53		0.945
POD30-Preop	-1.52 ± 1.03		-0.71 ± 0.75		0.001
LBM (kg)	n	Mean ± SD	n	Mean ± SD	
Preop	28	48.83 ± 10.16	29	51.05 ± 9.58	0.400
POD7	28	48.11 ± 10.75	28	50.09 ± 9.94	0.477
POD30	25	41.57 ± 9.12	26	48.36 ± 9.51	0.012
ASMI (kg/m <sup>2</sup> )	n	Mean ± SD	n	Mean ± SD	
Preop	28	8.56 ± 1.18	29	8.63 ± 1.02	0.881
POD7	28	7.82 ± 1.15	28	8.09 ± 0.93	0.338
POD30	25	6.43 ± 0.95	26	7.61 ± 1.02	<0.001

Abbreviations: Preop, preoperative; POD7, postoperative day 7; POD30, postoperative day 30; BMI, body mass index; LBM, lean body mass; ASMI, appendicular skeletal muscle mass. AMSI = appendicular skeletal muscle mass (kg)/height<sup>2</sup> (m<sup>2</sup>).

**Conclusions:** This pilot RCT showed that an enhanced nutritional support pathway was feasible, safe and might beneficial to enhanced recovery after esophagectomy.

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**Disclosure of Interest:** None declared.

### PT03.05 VALIDATION OF GLIM MALNUTRITION CRITERIA WITH SGA AND FFMI MEASUREMENT IN 150 HOSPITALIZED PATIENTS

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**Rationale:** Subjective Global Assessment (SGA) is a recognized and validated method for malnutrition diagnosis. However, recently a global consensus of numerous clinical nutrition societies has proposed the Global Leadership Initiative on Malnutrition (GLIM) criteria for diagnosis and identification of malnutrition in clinical settings. The aim of this study was to compare SGA assessment and GLIM malnutrition criteria and to evaluate the measurement of FFMI (Fat Free Mass Index) alone as a useful tool for malnutrition diagnosis

**Methods:** 150 (74 male and 76 female) hospitalized patients were assessed for SGA, and GLIM criteria including FFMI, using BodyStat 4000, UK (N = 117 from the 150). Phase Angle (PA) was also obtained. Statistical analysis used Pearson correlation and Stepwise multiple Regression. The study was approved by local IRB.

**Results:** Mean age was 58 ± 18 years, mean BMI was 27.8 ± 6.7 kg/m<sup>2</sup>. Diagnosis included 69.8% Mild and moderate malnutrition (SGA A and B) and severe malnutrition was found in 30.2% patients. GLIM malnutrition criteria was correlated with SGA assessment (R = 0.353, p ≤ 0.001). GLIM was better correlated with low FFMI alone (R = 0.566 p ≤ 0.001), but not with PA (R = -0.316, p < 0.44). SGA had a poor correlation with PA (R = -0.315, p = 0.45). A stepwise multiple regression was conducted to evaluate whether SGA, low FFMI scores and Dry Lean Body Mass (DLBM) are necessary to predict GLIM malnutrition criteria. The multiple correlation coefficient was R<sup>2</sup> = 0.782, (p < 0.0001) indicating approximately that most of the variance (78.2%) could be accounted by low FFMI (R<sup>2</sup> = 0.591, p ≤ 0.001), scores SGA (R<sup>2</sup> = 0.742, p ≤ 0.00), and DLBM (R<sup>2</sup> = 0.782, p ≤ 0.01).

**Conclusions:** In hospitalized patients, the GLIM malnutrition criteria are significantly correlated to SGA, low FFMI, and DLBM. GLIM malnutrition criteria can assess malnutrition. GLIM is highly correlated to FFMI.

**Disclosure of Interest:** None declared.

### PT03.06 MALNUTRITION IN CHILDREN AND ADOLESCENTS WITH MALIGNANT NEOPLASMS: A NEW PARAMETER FOR CLASSIFICATION AND EARLY IDENTIFICATION?

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**Rationale:** Malnutrition in cancer is a frequent finding, occurring both by the biochemistry of malignant tumor cells and by treatment toxicity. To date, no simple instrument has been proposed worldwide that best identifies the state of malnutrition in this population, since BMI has several limitations. The main objective of this work was to identify cutoff values of calf circumference (CC) for malnutrition in children and adolescents with malignant neoplasms.

**Methods:** A cross-sectional study that assessed patients from 0 to 19 years old at a Pediatric Oncology Specialized Institute between October 2015 and April 2017. Measurements of weight (kg), height (cm), CC (cm) were evaluated, and BMI were calculated. ROC curves were performed, with sensitivity and specificity analysis, considering

the gold standard BMI z-score, to identify cutoff points of CC for malnutrition. Statistical significance was p < 0.05.

**Results:** Among the 1794 assessments, 56.3% (n = 1011) were male. Taking into consideration the best sensibility and specificity, area under the curve, and confidence interval 95% (CI95%) the cutoff values of CC, in centimeters to identify undernutrition, according to the age range, in years (y), for males, were: 0–1 y: ≤17,2 cm; 2–5 y: ≤18,8 cm; 6–9 y: ≤23,9 cm; 10–12 y: ≤25,3 cm; 13–15 y: ≤28,2 cm; 16–19 y: ≤32,0 cm; and for females: 0–1 y: ≤15,4 cm; 2–5 y: ≤18,9 cm; 6–9 y: ≤24,1 cm; 10–12 y: ≤24,4 cm; 13–15 y: ≤29,1 cm; 16–19 y: ≤30,2 cm; (p < 0,001). Malnutrition was observed in 30.14% of the sample, considering the classification by CC, and in 13.3%, considering the BMI z-score.

**Conclusions:** It is concluded that CC is a good parameter of malnutrition in children and adolescents with malignant neoplasms, better than BMI, besides being simple and easy to apply.

**Disclosure of Interest:** None declared.

## Nutrition and cancer/Obesity and the metabolic syndrome

### PT04.1 EVALUATION OF SYNERGIC POTENTIAL EFFECTS BETWEEN INULIN AND VOLUNTARY EXERCISE DURING OBESITY

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**Rationale:** The gut microbiota can be influenced by dietary prebiotics, which have been proposed as modulators of behavior and metabolism in obesity. Here we tested the hypothesis of the interest to combine physical exercise and prebiotics in a model of diet-induced obesity.

**Methods:** 45 male C57BL/6J mice were randomized in: 1) Control diet; 2) High-fat diet (HFD, 45% kcal from fat); 3) HFD + Inulin (0.2 g/day/mice) (HFD + I); 4) HFD + exercise using a voluntary running wheel (HFD + Ex); 5) HFD + Inulin + Exercise (HFD + I + Ex). Mice were individually housed (n = 9 per group), a locked wheel was placed in the cage of sedentary mice and the experiment lasted for eight weeks. Behavioral testing using a light/dark box and an oral glucose tolerance test (OGTT) were performed respectively during the 6<sup>th</sup> and the 7<sup>th</sup> week.

**Results:** After eight weeks, physical activity was similar between the two groups of mice submitted to running wheel. All mice gained a similar body weight upon HFD. Only voluntary exercise limited the increased of subcutaneous adipose tissue weight (p < 0.05). Interestingly, inulin supplementation improved the glucose tolerance and this effect was higher when combined with voluntary exercise. Moreover, we found that only inulin reduced the anxiety-like behavior, associated with a lower level of plasma corticosterone (p < 0.05 for inulin treatment). In addition, the increase of cecal content – signing gut fermentation- was found in inulin groups but the fermentation seems to be higher in active mice. Finally, inulin increased *Bifidobacterium* species independent on exercise, but further expanded *Roseburia* and *Lactobacillus* species when combined with exercise.

**Conclusions:** Our work highlighted a synergic effect of inulin supplementation and physical activity on glucose tolerance, both treatment exerting differential effect on adiposity and anxiety. Future efforts will focus on correlations existing between the changes in gut microbiota and the beneficial consequences of both inulin and exercise during obesity.

**Disclosure of Interest:** None declared.



#### PT04.2 THE INFLUENCE OF PREOPERATIVE WEIGHT LOSS ON GASTRIC CANCER PATIENTS' PROGNOSIS

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**Rationale:** To investigate the influence of preoperative weight loss on gastric cancer patients' prognosis.

**Methods:** We conducted a retrospective study which included 363 gastric cancer patients. These patients underwent gastrectomy directly after being diagnosed from January 2002 to September 2006. These patients were divided into three groups according to the percentage of weight loss which happened during 6 months before their diagnoses: no weight loss group (0%), mild weight loss group (<10%) and severe weight loss group (<sup>3</sup>10%). We compared the clinicopathological characteristics and analyzed the influence of preoperative weight loss on patients' survival prognosis. We used Kaplan-Meier methods to calculate the survival rates. Univariate analysis and multivariate analysis were both proceeded by Cox regression model.

**Results:** Among the 363 gastric cancer patients, no weight loss group had 163 patients, mild weight loss group had 128 patients and severe weight loss group had 72 patients. The 5-year overall survivals of the three groups were 63.2%, 53.1% and 42.5% respectively. Three survivals were statistically significant ( $\chi^2 = 78.482$ ,  $P < 0.01$ ). Univariate analysis showed that age (95% CI: 0.282–0.527,  $P < 0.01$ ), weight loss before surgery (95% CI: 0.142–0.462,  $P < 0.01$ ), tumor location (95% CI: 0.679–0.913,  $P < 0.05$ ), depth invasion (95% CI: 0.276–0.580,  $P = 0.000$ ) and lymphatic metastasis (95% CI: 0.379–0.628,  $P = 0.000$ ) were all associated with survivals of these patients. In multivariate analysis, age ( $HR = 1.536$ , 95% CI: 1.262–1.897,  $P < 0.01$ ), weight loss before surgery ( $HR = 1.632$ , 95% CI: 1.479–1.963,  $P < 0.01$ ), depth invasion ( $HR = 1.926$ , 95% CI: 1.653–2.112,  $P = 0.000$ ) and lymphatic metastasis ( $HR = 1.647$ , 95% CI: 1.514–1.709,  $P = 0.000$ ) were independent prognostic factors for gastric cancer patients' survival.

**Conclusions:** Gastric cancer patients with weight loss <sup>3</sup>10% before surgery had the worst outcomes. Preoperative weight loss may be a poor independent prognostic factor for gastric cancer patients. Perioperative nutrition support should be implemented for improving the prognosis of gastric cancer patients.

**Disclosure of Interest:** None declared.

#### PT04.3 PROGNOSTIC SIGNIFICANCE OF MUSCLE DEPLETION IN END-STAGE CANCER PATIENTS

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**Rationale:** Although muscle depletion is associated with adverse outcomes in cancer patients, change of mass, quality, and strength of muscle in end-stage cancer remains unclear. We investigated their potential as prognostic factors in end-stage cancer.

**Methods:** A retrospective study of all adult solid cancer patients referred to our palliative care team from July 2017 to April 2018 was conducted. We analyzed associations between survival time and: muscle mass (psoas muscle index [PMI]); muscle density of psoas muscle; pinch grip strength (PGS); edema and inflammation (C-reactive protein [CRP]), at first consultation. Cox's proportional hazards model was used to estimate the median mortality hazard ratio (HR) of each muscle variable.

**Results:** Of 78 solid cancer patients (45% male, median age 67 years), median survival was 91 (range 50–186, 95% CI) days. After adjustment for age, gender, edema and CRP as potential confounders, loss of PMI ( $HR 0.998$ , range 0.995–0.999, 95% CI,  $p = 0.01$ ), muscle density (0.999 0.998–0.999, 95% CI,  $p = 0.019$ ) and PGS (0.699, 0.502–0.974, 95% CI,  $p = 0.034$ ), independently predicted overall survival time.

**Conclusions:** Depletion of muscle mass and strength were independent predictors of survival in end-stage cancer patients. PMI, muscle density and PGS are feasible prognostic factors in end-stage cancer.

**Disclosure of Interest:** None declared.

#### PT04.4 TOLL-LIKE RECEPTOR 9 PLAYS AN IMPORTANT ROLE IN ANGIOTENSIN II-INDUCED ATHEROSCLEROSIS

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**Rationale:** Chronic vascular inflammation causes atherosclerosis. Toll-like receptor (TLR) 9 recognizes bacterial unmethylated DNA and plays a role in innate defense, whereas it can also provoke inflammation in response to fragmented DNA released from damaged mammalian cells. However, the role of TLR9 in the development of atherosclerosis remains unknown. Here, we investigated whether genetic deletion of TLR9 attenuates atherosclerosis in apolipoprotein E knockout (ApoE KO) mice.

**Methods:** TLR9/ApoE double knockout (dKO) mice were generated by crossing ApoE KO mice and TLR9 KO mice, and infused angiotensin II (Ang II) (1000 ng/kg/min) subcutaneously for 28 days using osmotic pump. The concentrations of double-stranded DNA (dsDNA) and single-strand DNA (ssDNA) in plasma were measured using a Quant-iT PicoGreen dsDNA Assay Kit and QuantiFluor ssDNA System, respectively. The gene expression of inflammatory molecules in vascular tissue and macrophages was evaluated by immunohistochemical analysis and real-time qPCR. We used peritoneal macrophages for in vitro experiments.

**Results:** There were no differences in blood pressure and plasma lipid levels between two strains of mice. Ang II infusion increased plasma levels of ssDNA and dsDNA, endogenous ligands of TLR9, in both strains of mice ( $P < 0.001$ , respectively). TLR9/ApoE dKO mice showed less atherosclerotic lesion progression in the aortic arch and less lipid accumulation in atherosclerotic plaques in the aortic root compared with ApoE KO mice ( $P < 0.05$ , respectively). TLR9/ApoE dKO mice also showed less gene expression of inflammatory molecules (e.g., ICAM-1 and MCP-1) in the abdominal aorta. The result of cell sorting experiment using atherosclerotic aorta obtained from Ang II-infused ApoE KO mice demonstrated that macrophage population mainly expressed TLR9 in this tissue. Similarly, pharmacological blockade of TLR9 attenuated vascular inflammation and atherogenesis in Ang II-infused ApoE KO mice. A TLR9 agonist markedly promoted pro-inflammatory activation of ApoE<sup>-/-</sup> macrophages. We, therefore, performed in vitro experiments using thioglycolate-stimulated peritoneal macrophages. CpG ODN, agonistic oligonucleotide for TLR9, markedly promoted the expression of inflammatory molecules (e.g., ICAM-1 and MCP-1) in ApoE KO macrophages but not in TLR9/ApoE dKO macrophages.

**Conclusions:** Our results suggested that Ang II infusion stimulates the TLR9 signaling in macrophages, leading to the promotion of vascular inflammation and atherosclerosis. TLR9 may serve as a potential therapeutic target for atherosclerotic diseases.

**Disclosure of Interest:** None declared.

#### PT04.5 REDUCED POSTPRANDIAL SERUM TRIGLYCERIDE AFTER A MEAL PREPARED USING HOT AIR FRYING: A RANDOMIZED CROSSOVER TRIAL

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**Rationale:** Elevated circulating non-fasting triglyceride (TG) or postprandial triglyceride (ppTG) is as an independent contributor to risk for coronary heart disease. We hypothesized that a commonly consumed fried meal (including French fries and chicken nuggets) prepared by a hot air frying technique (airfrying) would result in lower ppTG responses than the same meal prepared by conventional deep fat frying.

**Methods:** We conducted a randomized crossover meal test trial with a 7 day washout and standardized pre-test evening meals to evaluate the effects of hot air frying compared to deep fat frying in young healthy male (n = 10) and female subjects (n = 6). Serial blood samples (baseline, 30, 60, 90, 120, 150, 180, 240, 300, 360, 420 mins) were collected for biochemical analysis before and after administration of both meals. Participants were blinded to the meal type and detailed dietary intake assessments were performed throughout the trial.

**Results:** The subjects' habitual diets were similar before each of the meal tests. Hot air frying led to a large reduction (74%, 95%CI 70–78%) in the total fat content of the meal and intake of the meal produced a lower ppTG response (67%, 95% CI 52–82%) compared to deep fat frying ( $P < 0.01$ ). No differences in glucose ( $P = 0.34$ ), insulin ( $P = 0.62$ ), or GLP-1 ( $P = 0.35$ ) responses were found. Satiety was not affected by meal type.

**Conclusions:** Hot air frying of a common meal results in lower ppTG excursions. Hot air frying technologies are effective for lowering mealtime fat intakes and have demonstrable beneficial effects on an established cardiovascular risk factor.

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#### PT04.6 CYTOTOXIC POTENTIAL OF LIPOSOMES CONTAINING N-3 POLYUNSATURATED FATTY ACIDS IN THE LIPID BILAYER AND 5-FLUOROURACIL IN THE AQUEOUS CORE (LIPUFU) ON TWO DIFFERENT HUMAN COLORECTAL ADENOCARCINOMA CELL LINES

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**Rationale:** Previous studies have shown a potential synergy between n-3 polyunsaturated fatty acids (n-3 PUFAs) and 5-fluorouracil (5-FU), the commonly used chemotherapeutic agent in colorectal cancer treatment<sup>1</sup>. This study aims at evaluating whether the incorporation of n-3 PUFAs into the lipid bilayer of liposomes loaded with 5-FU (LIPUFU) is more efficient than n-3 PUFAs or 5-FU administration alone.

**Methods:** Liposomal formulations containing docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) in the lipid bilayer and 5-FU in the aqueous core (LIPUFU) were obtained by the classic thin film hydration method followed by sonication and ultracentrifugation cycles. Control liposomes (LIP) with only n-3 PUFAs (LIPU) or only 5-FU

(LIFU) were produced in a similar way. Characterization of the different liposomal formulations was performed with zetasizer and transmission electron microscopy. The incorporation rates of n-3 PUFAs and 5-FU were determined by gas chromatography and high performance liquid chromatography, respectively. The effects of these different liposomal formulations on the cell cycle, apoptosis and viability were evaluated by fluorescence activated cell sorting analyses in two human colorectal adenocarcinoma cell lines differing in 5-FU sensitivity, LS174T (p53<sup>+/+</sup>, bax<sup>-/-</sup>) being less sensitive than HT-29 (p53<sup>-/0</sup>, bax<sup>+/+</sup>). **Results:** Liposomal formulation gave stable LIPUFU at 4°C for at least 3 months with uniform size of 166 ± 12 nm, polydispersity index of 0.12 and zeta potential between -56.5 and -36.9 mV. The incorporation rate of DHA, EPA and 5-FU was 66.4 ± 15.8, 91.4 ± 19.1 and 13.8 ± 0.7 µg/mL, respectively. LIPUFU were more cytotoxic than LIP, LIFU and LIPU on both HT-29 and LS174T cells. Similar to LIFU, LIPUFU increased the percentage of cells in S-phase of the cell cycle, in apoptosis and necrosis.

	HT-29		LS174T	
	Viable cells (%)	S-phase cells (%)	Viable cells (%)	S-phase cells (%)
Controls	100.0 ± 0.9*	10.8 ± 1.2*	100.0 ± 0.5*	12.5 ± 0.7*
LIP	100.3 ± 0.9*	12.3 ± 0.8*	99.2 ± 1.0*	13.1 ± 0.6*
LIFU	98.5 ± 0.5*	27.6 ± 2.2*	98.8 ± 0.8*	16.0 ± 2.1
LIPU	99.4 ± 2.0*	9.5 ± 1.9*	87.8 ± 2.7	6.8 ± 1.0*
LIPUFU	86.4 ± 9.6	20.6 ± 1.3	86.0 ± 6.8	15.1 ± 1.0

\*Means ± SD significantly different from LIPUFU (*t*-test,  $P \leq 0.05$ ); n = 4/ condition.

**Conclusions:** These preliminary results show that the LIPUFU formulation is stable and the combination of n-3 PUFAs and 5-FU in a single stealth liposome can decrease the viability of cancer cell lines through a possible additive or synergistic effect.

#### Reference

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**Disclosure of Interest:** None declared.

### Nutrition and chronic disease/Nutritional assessment/Nutritional techniques and formulations

#### PT05.1 SERUM N-6 POLYUNSATURATED FATTY ACIDS AND RISK OF ATRIAL FIBRILLATION IN MEN

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**Rationale:** n-6 polyunsaturated fatty acids (PUFA) have been associated with lower risk of cardiovascular disease, but little is known about their antiarrhythmic properties. We investigated the associations of the serum n-6 PUFAs with the risk of atrial fibrillation (AF).

**Methods:** 2450 men free of AF at baseline from the prospective, population-based Kuopio Ischaemic Heart Disease Risk Factor Study (KIHD) aged 42–60 years in 1984–1989 were included. The n-6 PUFAs included linoleic acid (LA), arachidonic acid (AA),  $\gamma$ -linolenic acid (GLA) and dihomo- $\gamma$ -linolenic acid (DGLA). In the analyses, the n-6 PUFAs were expressed as the proportion of all serum fatty acids. All AF events that occurred between study entry and December 31, 2014, were

included. Cox proportional hazards regression were used to estimate hazard ratio (HR) of incident events.

**Results:** The mean±SD serum concentrations were 26.4 ± 4.7% for LA, 4.8 ± 1.1% for AA, 0.3 ± 0.1 for GLA and 1.3 ± 0.3 for DGLA. During the mean 22.4-y follow-up, 337 men were diagnosed with AF.

In the analysis adjusted for multiple potential confounders, the HR for incident AF in the highest vs. the lowest serum LA quartile was 0.76 (95% CI 0.58–1.00, P = 0.07). In contrast, the other n-6 PUFAs were not associated with the risk (AA: extreme-quartile HR 0.98, 95% CI 0.74–1.30, P = 0.52; GLA: extreme-quartile HR 1.04, 95% CI 0.80–1.35, P = 0.78; and DGLA: extreme-quartile HR 1.12, 95% CI 0.85–1.46, P = 0.70).

**Conclusions:** Higher serum concentration of the major n-6 PUFA, LA, but not the other n-6 PUFAs, was associated with lower risk of AF among middle-aged and older men.

**Disclosure of Interest:** None declared.

### PT05.2 METABOLIC DISBALANCE AFTER ACUTE PESTICIDE EXPOSURE – EXPERIMENTAL STUDY

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**Rationale:** In order to fulfill the continuous growth of food demand, pesticide use rose uncontrollably, becoming an important environmental risk factor. Despite their efficiency in crop protection and vector-borne disease control, organophosphate compounds are associated with severe toxic effects, including metabolic disturbances.

**Methods:** In order to evaluate the acute changes of metabolic status after organophosphate poisoning we performed an experimental study on 13 Wistar rats. They were distributed in two groups – study group A and control group B. Firstly, 0.1 mg/kg chlorpyrifos was administered by oral gavage in group A and six hours later blood samples were taken to determine the level of cholinesterase, blood sugar, insulin, IGF-1 and cortisol. In group B an equivalent quantity of normal saline was administered through the same method and blood samples were collected in order to determine the above mentioned parameters. Blood drawing procedures and organophosphate administration were performed under general anesthesia according to international guidelines. The statistical analysis was performed using the SPSS statistical software, setting a standardized significant P value at 0.05.

**Results:** Levels of cholinesterase were significantly decreased after exposure to chlorpyrifos and the difference between the two groups was of 1458 U/L (p < 0.001). Glucose level was significantly higher in group A (103 mg/dl ± 5.8 vs 117 mg/dl ± 9.7) (p = 0.015). Insulin and IGF-1 levels were also significantly increased in the poisoned group. Cortisol levels were significantly higher after chlorpyrifos administration (358.75 ± 43 vs 241.2 ± 35) with p = 0.0004.

**Conclusions:** In this study we demonstrate that acute exposure to organophosphates may cause important metabolic disturbances, even at relatively low doses. Moreover, the identified changes on glucose profile sustain the trending published data that continuous pesticide exposure is a risk factor for further metabolic diseases.

**Disclosure of Interest:** None declared.

### PT05.3 ALUMINIUM BLOOD LEVELS IN INPATIENTS WITH PARENTERAL NUTRITION: COMPOUNDED VERSUS MULTICHAMBER-BAG PARENTERAL NUTRITION

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**Rationale:** Aluminum (Al) is a known contaminant of pediatric parenteral nutrition (PN). Despite this fact, few studies have been performed in adult patients, and to our knowledge none with multi-chamber-bags (MCBs). The objective is to assess blood Al levels (BLAIs) in adult inpatients with PN, regarding the type of PN (MCB or compounded), PN days, liver and renal parameters.

**Methods:** We conducted a retrospective study from prospective data. Adult inpatients with PN from november 2018 to March 2019 with BLAI data were included and placed into two groups (MCB or compounded PN). Plasma Al concentration was retrospectively gathered from the patient charts of all inpatients receiving PN. BLAI obtained were compared depending on the type of PN, length of PN therapy, and renal and liver blood parameters. Linear regression models were performed with BLAI as dependent variable, and type of PN, length of PN, and liver and renal parameters as independent modifiers variables.

**Results:** A total of 80 samples from 55 patients were included. Mean BLAI value was 2.8 ± 2.0 µg/L for samples collected after a mean of 23.6 ± 40.9 days of PN. A total of 47 samples (58.8%) were collected during the administration of MCB PN and 33 samples (41.2%) during the administration of compounded PN. Mean liver parameter values were: GGT 330.6 ± 372.8 U/L, alkaline phosphatase 241.8 ± 166.4 U/L; the % of patients with hyperbilirubinemia (bilirubin >1.2 mg/dL) was 37.5%. Data were compared regarding the variables mentioned. Mean BLAI was higher in the compounded group, 3.0 ± 2.0 µg/L versus 2.7 ± 2.0 µg/L in the MCB group. However, no significant differences in mean BLAI were found regarding the type of PN (MCB or compounded), length of PN, use of renal replacement therapy, renal function, or liver parameters (GGT, alkanine phosphatase). However, linear regression models showed a positive association between BLAI and hyperbilirubinemia; beta coefficient 1.42 (95%CI 0.56–2.28) p < 0.01.

**Conclusions:** The BLAI could not be influenced by the type of PN (MCB or compounded). However the study found difference in BLAI in patients with hyperbilirubinemia. Monitor the BLAI and limit Al exposure in patients with hyperbilirubinemia should be done to avoid adverse effects related to Al.

**Disclosure of Interest:** None declared.

### PT05.4 SCREENING TESTS FOR DYSPHAGIA IN MOTOR NEURON DISEASE

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**Rationale:** Deglutition disorders are common in patients with motor neuron disease (MND). Oropharyngeal dysphagia (OD) can occur in 80% of patients. OD contributes negatively in the evolution of MND. An early diagnosis of OD would allow a better nutritional approach, which in turn would improve the quality of life of the patient. Currently, there are no specific clinical tests for the diagnosis of dysphagia in MND. In this study, we aimed to assess specificity and sensitivity of the dysphagia screening tests available for other diseases (EAT-10), as well as to compare the specific swallow assessment scale for ALS (ALS-SS) results with videofluoroscopy (gold standard technique for the diagnosis of dysphagia).

**Methods:** From 154 patients visited in the Functional Unit of MND of the “Hospital de Bellvitge,” between September 2017 and July 2018, with different disease status progression, and who met inclusion criteria, 46 agreed to participate in our study. 52.17% were women; bulbar affection was in 78.3% patients which 30.6% with bulbar onset and 69.4% in later stages of evolution. OD was assessed in all patients with videofluoroscopy and dysphagia screening tests: EAT10 and subscale ALS-SS. Participants were also asked to fill out a quality of life questionnaire (SwalQoL), from which a selection was made of the 6 items that were considered of greatest interest for the assessment of dysphagia.

**Results:** Compared with videofluoroscopy, ALS-SS subscale showed a better specificity (87.5%) and sensitivity (72.9%) than EAT10, which specificity and sensitivity were 70.3% and 75.0% respectively. SwalQoL 6 items selection showed a specificity of 100% and a sensitivity of 50%.

**Conclusions:** ALS-SS gives similar results to those of videofluoroscopy. The EAT-10 test is not specific enough to discriminate dysphagia in MND patients, although it is the most widely used by dietitians as screening for dysphagia. In contrast, Swal QoL 6 items selection can perform an interesting test of discrimination of patients who do not really have OD in patients with MND. In order to describe the severity of the dysphagia and adjust the diet to the patient's needs, it will be necessary to perform a videofluoroscopy.

**Disclosure of Interest:** None declared.

#### PT05.5

##### CLINICAL APPLICATION OF RAW CORN STARCH-BASED DIET IN PATIENTS WITH INSULINOMA: A BEFORE-AFTER PROSPECTIVE STUDY

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**Rationale:** Insulinoma, a rare insulin-secreting tumor, may cause severe hypoglycemia and subsequent hyperphagia as well as weight gain. The nutritional interventions play a role in its adjuvant management. This is the first study that tried to stabilize blood glucose and weight in unoperated insulinoma patients by using raw corn starch (RCS)-based diet.

**Methods:** 28 consecutive patients with unoperated insulinoma were offered a structured diet with 60%~70% from carbohydrate. RCS constituted 30%~50% of daily carbohydrate, and was administered as snacks between meals or every 4 hours at night.

**Results:** The 28 patients (8 males) were at age of 47.6 ± 14 years (range 21~75 years). Among them, 20 patients underwent the dietary therapy during an average waiting time of 36.9 ± 41.9 days (range 4~192 days) before curative surgery, while 8 patients with unresectable insulinoma relied primarily on long-term RCS-based intervention for an average time of 95.6 ± 92.8 days (range 20~267 days). Before the dietary intervention, the mean fasting blood glucose (FBG) was

2.27 ± 0.64 mmol/L (range 0.9~3.6 mmol/L), with onset of hypoglycemia (BG < 2.8 mmol/L) occurring more than 3 times/week in all subjects. The median BMI was 27.87 ± 5.07 kg/m<sup>2</sup> (range 17.06~40.06 kg/m<sup>2</sup>), with 14 (50.0%) patients complicated with obesity, and 8 (28.6%) with overweight. After nutritional therapy for over 1 week, the mean FBG was significantly elevated to 3.30 ± 0.91 mmol/L (range 1.8~5.7 mmol/L) (P < 0.001), and frequency of hypoglycemia was decreased to less than twice/week in 75% of subjects (21 cases). Of 13 patients having RCS-based diet for over 4 weeks, weight remained stable in 10. Besides, 2 cases of mild diarrhea, and 1 case of flatulence were reported among patients, but relieved when RCS was slightly reduced.

**Conclusions:** RCS-based diet constitute a feasible and safe adjuvant therapy to alleviate hypoglycemia and weight gain for unoperated insulinoma patients.

**Disclosure of Interest:** None declared.

#### PT05.6

##### OPTIMAL CUTOFF VALUE OF THE GERIATRIC NUTRITIONAL RISK INDEX AS A NUTRITIONAL SCREENING TOOL

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**Rationale:** The Geriatric Nutritional Risk Index (GNRI) predicts nutritional risk and poor outcomes in geriatric patients. However, little is known about its optimal cutoff value for nutritional screening in older adults. This study aimed to identify the GNRI's optimal cutoff value to screen older patients with malnutrition.

**Methods:** A cross-sectional study of 5,873 consecutive patients aged ≥65 years admitted to an academic hospital was conducted. The GNRI was calculated using actual and ideal body weight, body height, and albumin level. Receiver-operating characteristic (ROC) curve analyses were performed to obtain the GNRI's optimal cutoff value against values of validated screening tools: Mini Nutritional Assessment Short Form (MNA-SF) ≤11 points and Malnutrition Universal Screening Tool (MUST) ≥1 point. The validation of the obtained cutoff values was examined per the concordance rate of malnutrition diagnosis based on the European Society of Clinical Nutrition and Metabolism (ESPEN) criteria between GNRI-, MNA-SF-, and MUST-based diagnoses.

**Results:** The mean age was 76.0 ± 7.0 years. Approximately 45.6% and 39.7% of patients were at risk of malnutrition based on their MNA-SF and MUST scores, respectively. ESPEN-defined malnutrition was diagnosed in 16.8% and 17.3% of patients who completed the MNA-SF and MUST as the first-step tool, respectively. The ROC curve analyses showed that the GNRI's optimal cutoff value for MNA-SF ≤11 was 95.92 (area under the curve [AUC]: 0.827 [0.817–0.838], p < 0.001) and that for MUST ≥1 was 95.95 (AUC: 0.788 [0.776–0.799], p < 0.001). In adapting GNRI <96 as the first screening step in diagnosing malnutrition, the concordance rates of the comparisons were 98.5% for both MNA-SF- and MUST-based diagnoses.

**Conclusions:** The GNRI, with an optimal cutoff value of <96, might be easy to use for nutrition screening and malnutrition diagnosis in older adults.

**Disclosure of Interest:** None declared.

## Obesity and the metabolic syndrome

### PT06.1

#### EFFECTS OF KRILL OIL ON OMEGA-3 INDEX AND CARDIOMETABOLIC RISK FACTORS IN PATIENTS WITH NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD): PILOT RANDOMIZED DOUBLE-BLIND TRIAL

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**Rationale:** NAFLD is considered a liver manifestation of metabolic syndrome and the key role in its pathogenesis plays insulin resistance. There is currently no standardized pharmacological treatment and the only proven therapeutic strategy is lifestyle modification. Omega-3 fatty acid treatment may have beneficial effects in regulating hepatic lipid metabolism, adipose tissue function, and inflammation. Considering that NAFLD patients have a higher risk of developing cardiovascular disease, the aim of this study was to examine the influence of omega-3 fatty acids from krill oil on various risk factors in NAFLD patients.

**Methods:** The study was randomized, double blind and placebo controlled, and lasted for 6 months. It included 14 NAFLD patients, ages 39 to 64, divided into two groups. In the intervention group, subjects consumed krill oil capsules (1500 mg krill oil, 36 mg vitamin E, 165 mcg selenium daily), while in placebo group subjects consumed soybean oil capsules (1500 mg soybean oil daily). The patients were diagnosed with NAFLD by the standard diagnostic algorithm procedure and tools including ultrasound. Methods included standard anthropometric measurements, biochemical tests: serum lipids, liver enzymes, calculation of value of fatty liver index (FLI) as well as measurement of omega-3 index (level of EPA and DHA in red blood cells) according to method by Rose and Oklander and ISO method 5509.

**Results:** The results of the study showed that there was a statistically significant reduction in body mass ( $p=0.028$ ), BMI ( $p=0.043$ ) and waist circumference ( $p=0.041$ ) in the intervention group compared to the placebo group where the change was not statistically significant. None of the groups showed statistically significant changes in serum lipids and liver enzymes. Fatty liver index decreased in intervention study in 75% patients with NAFLD, while in placebo group, FLI increased in 66% of the subjects.

**Results** of assessment of cardiovascular risk before the intervention are indicating insufficient cardio-protection in both groups because of low omega-3 index:  $3,25 \pm 1,14\%$  in females and  $3,74 \pm 0,97\%$  in males. After the intervention, there was a 7,7% increase in omega-3 index in the intervention group, while there was 6% decrease in omega-3 index in placebo group.

**Conclusions:** Improvements in waist circumference, omega-3 index and fatty liver index in the intervention group indicate the potential of use of krill oil in the population of NAFLD patients. Considering that this is the first research on this subject, further studies should involve a larger number of subjects that would establish the dose of krill oil omega-3 fatty acids as a treatment and determine the preferable duration of therapy.

**Disclosure of Interest:** None declared.

### PT06.2

#### EFFECTS OF LOW-VOLUME HIGH-INTENSITY- VERSUS MODERATE-INTENSITY INTERVAL TRAINING ON CARDIOMETABOLIC HEALTH IN OBESE INDIVIDUALS: PRELIMINARY RESULTS OF A RANDOMIZED-CONTROLLED TRIAL

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**Rationale:** Physical activity (PA) and dietary modifications are cornerstones in the treatment of obesity and related cardiometabolic risk factors. However, many obese adults do not achieve the recommended PA-levels (150 min/week) and lack of time is among the reasons most commonly cited for insufficient PA. High-intensity interval training (HIIT) has emerged as a time-efficient exercise strategy to improve various health outcomes. However, it was also argued that HIIT might be inappropriate for sedentary individuals because it is too strenuous and potentially unsafe for patient collectives. This study compared the effects of two extremely time-efficient training regimens (15 min/session), either performed as high- (HIIT) or moderate-intensity interval training (MIIT), on cardiometabolic health in obese individuals.

**Methods:** 44 obese subjects (BMI:  $37.6 \pm 5.5$  kg/m<sup>2</sup>, body fat:  $44 \pm 7\%$ ) with  $\geq 2$  further risk factors were randomized to HIIT, MIIT or a control group (CON). All groups received nutritional counselling (aim:  $-500$  kcal/day). HIIT and MIIT were performed on cycle ergometers ( $2 \times$  weekly for 12 weeks) consisting of  $5 \times 1$  min at 85–95% and 70–80% maximum heart rate, respectively. Primary endpoints were the metabolic syndrome z-score (MetS, determined from fasting blood glucose, HDL-cholesterol, triglycerides, waist circumference and blood pressure) and maximum oxygen uptake (VO<sub>2</sub>max).

**Results:** HIIT and MIIT were both well tolerated and no adverse events occurred. All groups significantly reduced body weight ( $P < 0.05$ , average: 2.9 kg) but only the exercise groups improved MetS and VO<sub>2</sub>max. HIIT improved MetS ( $-1.5$  units,  $P < 0.01$ ) and VO<sub>2</sub>max ( $+2.9$  ml/kg/min,  $P < 0.001$ ) to a greater magnitude than MIIT (MetS:  $-1.2$  units,  $P < 0.05$ ; VO<sub>2</sub>max:  $+1.8$  ml/kg/min,  $P < 0.05$ ).

**Conclusions:** The preliminary results of this study indicate that extremely time-efficient interval training may significantly improve in cardiometabolic health in obese individuals in an intensity-dependent manner. Clinically relevant health benefits can also be achieved with moderate-intensity intervals. Moreover, these findings underpin the crucial role of exercise in improving health outcomes that goes far above simple weight loss.

**Disclosure of Interest:** None declared.

### PT06.3

#### PURIFIED EGG PROTEIN SUPPLEMENTATION HAS BENEFICIAL EFFECTS ON BODY COMPOSITION, METABOLISM AND EATING BEHAVIOR AND RESULTS IN A MORE SUSTAINED WEIGHT LOSS THAN LOW FAT DIET

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**Rationale:** An increasing body of literature emphasizes the interest of moderate enrichment in protein for treating obesity and its metabolic consequences. However, egg proteins that are known to have the

highest biological value have not been studied in this context. We investigated in self-restricted obese individuals with low protein intake (PI) ( $<0.7 \text{ g} \cdot \text{kg}^{-1} \cdot \text{d}^{-1}$ ) the effects of increasing PI up to  $1.5 \cdot \text{d}^{-1}$  on body weight, body composition, eating behavior, resting metabolic rate (RMR) and kidney function.

**Methods: Randomized controlled trial over 2 months.** Twelve subjects were given daily supplements of a formula of purified high biological value egg protein (PEP) (Ovamine<sup>(R)</sup> Nuvia laboratories, Paris) to achieve this level of PI while ten matched controls were given a simple low fat high protein diet (LFHPD). Subjects were tested before and after 2 months. **Controlled follow-up trial over 18 months:** 337 subjects divided into three matched groups followed over 18 months: no change in diet or lifestyle (n = 69); LFD (n = 171), and PEP (n = 97) targeting  $1.2 \cdot \text{d}^{-1}$  protein with the same purified egg protein preparation of high biological value.

**Results: Randomized controlled trial over 2 months.** PEP resulted in a lower percentage of lipids ( $-13.6\% \text{ p} < 0.01$ ) in diet. Appetite increased under LFHPD and decreased under PEP ( $p = 0.006$ ) with a feeling of eating less ( $p < 0.01$ ), yet in both groups, total calculated energy intake was not decreased. Under PEP (but not LFHPD) there was a decrease in fat mass ( $-3.2 \pm 1.3 \text{ kg} \text{ p} < 0.05$ ). Creatinine clearance increased by 10% under PEP (before:  $149 \pm 19$ ; after:  $162 \pm 22 \text{ ml} \cdot \text{min}^{-1} \text{ p} = 0.05$ ) but not under LFHPD. Microalbuminuria was unchanged.

**Controlled follow-up trial over 18 months:** In the group of control subjects (n = 58) there was a gradual weight increase up to  $+8.58 \pm 0.56\%$  of initial weight on the 18th month, while subjects on low fat diet had lost  $-5.55 \pm 1.31$  and those receiving moderate enrichment in protein had lost  $-8.07 \pm 1.58$ . During the first 6 months the curves of low fat diet and protein supplementation are almost overlapped but after 8 months the difference becomes significant. At 18 mo, subjects on low fat diet have lost  $-5.95 \pm 1.82$  and those receiving moderate enrichment in protein have lost  $-8.05 \pm 1.87$  ( $p = 0.023$ ). On the whole moderate enrichment in protein induces a weight loss  $>10\%$  in 18% of the subjects and a weight loss  $>5-10$  in 22% of them. Visual analogic scales evidence in receiving egg protein a decrease in appetite ( $p < 0.01$ ) and nibbling ( $p < 0.01$ ) and an increase in satiety ( $p < 0.01$ ). The effect on body weight is more pronounced in three categories of subjects: those with marked excess calorie intake, those with initial low protein intake, and those whose phase 2 insulin response is higher.

**Conclusions:** PEP supplements are an easy means for increasing PI and reducing fat intake. They induce a slight loss in body fat, with preservation of lean mass, and only marginal changes in glomerular filtration. Weight loss is more pronounced ( $+38\%$ ) and continues over a longer period under PEP compared to LFD. Since egg proteins are the variety of proteins that possess the greatest biological value and have additional biological properties beneficial for cardiovascular and metabolic health, they are likely to represent a new promising tool for the management of obesity and metabolic syndrome. Further controlled studies are in progress to better assess this issue.

**Disclosure of Interest:** None declared.

#### PT06.4

### PRESCRIPTION TRENDS AND EFFECTS OF SODIUM-GLUCOSE COTRANSPORTER TYPE 2 INHIBITORS ON WEIGHT AND GLYCEMIC CONTROL IN OBESE PATIENTS WITH TYPE 2 DIABETES: A SINGLE-CENTRE REAL WORLD EXPERIENCE

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**Rationale:** Sodium-glucose cotransporter type 2 inhibitors (SGLT2is) are recommended for a large spectrum of patients with type 2 diabetes (T2DM), because of favorable effects on glycemic control and weight. With a view to identifying patient profile that could influence physicians' prescription of SGLT2is, we carried out this observational study in routine clinical practice conditions. Outcomes after add-on these drugs were described as well.

**Methods:** The study was based on a retrospective design and the following variables were collected to identify potential influencing factors in patient profile at baseline: gender, age, time of evolution of T2DM, body mass index (BMI), HbA1c level and treatment with insulin. To measure outcomes, changes in HbA1c and BMI at 6 months after add-on, were assessed.

**Results:** 75 poorly controlled patients with T2DM who received any SGLT2is as add-on therapy were analysed. There was a homogeneous distribution according to the drugs evaluated (empagliflozin, dapagliflozin and canagliflozin). At baseline: age:  $59.4 \pm 11$  years; HbA1c:  $8.8 \pm 1.4\%$  duration of T2DM:  $11.9 \pm 8$  years; 69.3% men. Macrovascular disease was in 34.7%. 78.7% were on insulin. BMI at time of add-on was  $33.7 \pm 6 \text{ Kg/m}^2$ . At 6 months, significant reductions ( $p < 0.001$  for every parameter) on weight ( $-3 \pm 0.9 \text{ Kg}$ ), BMI ( $-1.1 \pm 0.4 \text{ Kg/m}^2$ ) and HbA1c ( $-1.8 \pm 0.6\%$ ) were observed. There was a nonsignificant trend to prescribe empagliflozin to patients with macrovascular complications. No significant changes in HbA1c, weight and BMI reductions were detected among drugs.

**Conclusions:** Our experience shows SGLT2is, are mainly prescribed in T2DM patients with high level of HbA1c, long duration of T2DM and frequently, on insulin. There is a trend to prescribe empagliflozin in the presence of macrovascular disease. HbA1c, weight and BMI reductions are equivalent among different SGLT2is in our routine clinical practice.

**Disclosure of Interest:** None declared.

#### PT06.5

### THE LOSS OF FAT-FREE MASS: AN EARLY EVENT IN PATIENTS WITH MORBID OBESITY UNDERGOING BARIATRIC SURGERY

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**Rationale:** Bariatric surgery (BS) induces a significant and sustained weight loss in time, but apart from the reduction of body fat, patients can lose muscle mass. The existing data in the literature on the evolution of fat-free mass (FFM) after BS is controversial. The analysis of body composition by bioimpedance (BIA) is a widely used method to evaluate FFM.

**Methods:** To evaluate, through BIA, the evolution of FFM in patients with morbid obesity undergoing BS.

Prospective study of patients undergoing BS in our center between April-September 2018. All patients underwent a 1-month post-BS study: physical examination, biochemical analysis, dietary interview and BIA. The BIA evaluated: fat free mass index (FFMI), fat mass (FM) and fat free mass (FFM).

**Results:** 44 patients were evaluated: 70.5% women, age  $45.57 \pm 10.6$  years, BMI  $44.7 \pm 5.31 \text{ kg/m}^2$ . 56.8% of patients underwent Roux-en-Y gastric bypass (RYGB) and 43.8% had vertical gastrectomy (VG). Average FFMI prior to the intervention was  $24.16 \pm 3.22 \text{ kg/m}^2$ . Average weight loss per month was  $12.74 \pm 1.82 \text{ kg}$ . Patients undergoing RYGB had significantly lower levels of post-BS transthyretin than with VG ( $p = 0.029$ ). However, the FFMI was  $22.7 \pm 2.9 \text{ kg/m}^2$  ( $p = 0.01$ ), without



significant differences between RYGB and VG ( $p = 0.712$ ). The reduction of the FFM at 6 months compared to the initial was  $7.1 \pm 1.46$  kg. The multivariate analysis discarded age, sex, surgical technique, BMI, FFMI, transthyretin levels, dietary questionnaire, as independent predictors of FFM loss at the post-BS month.

**Conclusions:** The study has demonstrated that the FFM lost is an early event in patients with morbid obesity undergoing BS. However, this reduction has not been related with protein metabolic parameters, this suggests an independent mechanism.

**Disclosure of Interest:** None declared.

#### PT06.6

### POSTPRANDIAL EFFECTS OF DIFFERENTLY COMPOSED MEALS ON METABOLIC MARKERS POSTPRANDIAL EVENTS IN OLDER ADULTS WITH METABOLIC SYNDROME TRAITS – APOE GENOTYPE POLYMORPHISM AS INFLUENCING FACTOR?

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**Rationale:** The apoE polymorphism has been shown to chronically impact blood levels of lipids and biomarkers of oxidation and inflammation, thereby contributing to graded risks for developing degenerative diseases. We hypothesize that apoE polymorphism may also effect (acute) postprandial metabolic responses.

**Methods:** Following a randomized crossover design, subjects with metabolic syndrome traits (apoE3,  $n = 39$ ; apoE4,  $n = 10$ ; mean age  $70 \pm 5$  y) consumed a Western diet high-fat meal (WD-HF) rich in saturated fatty acids, a WD high carbohydrate meal (WD-CH) rich in refined carbohydrates or a Mediterranean meal (MD) rich in monounsaturated fatty acids, dietary fiber and antioxidants. Blood samples were collected at fasting and 1, 2, 3, 4, and 5 h postprandially and analyzed for concentrations of triglycerides, glucose, insulin, interleukin-6 (IL-6), and oxidized LDL. Differences in postprandial responses (area under the curve, iAUC) between apoE3 and apoE4 genotype were calculated using linear mixed models.

**Results:** Magnitude of IL-6 release after the WD-HF meal was significantly higher in apoE4 carriers than in apoE3 subjects ( $P = 0.002$ ; iAUC: apoE4 =  $24.7$  vs. apoE3 =  $15.2$  h\*pg/mL). In addition, time to detect significant plasma IL-6 increase was shorter in apoE4 than in apoE3 subjects ( $P = 0.008$ ). In all groups, no significant change in plasma oxidized LDL was observed after meal intake. All three meals produced postprandial hyperglycemia, hyperinsulinemia, hyperlipidemia without any differences for apoE3 and apoE4 subjects, as seen in values for iAUC and postprandial graphics.

**Conclusions:** As hypothesized, apoE polymorphism affects postprandial metabolic responses influencing the individual CVD risk.

**Disclosure of Interest:** None declared.

## Nutritional techniques and formulations/ Obesity and the metabolic syndrome/ Nutrition and cancer/Nutritional assessment

#### PT07.1

### RELATION BETWEEN MALNUTRITION AND THE PRESENCE OF SYMPTOMS OF ANXIETY AND DEPRESSION IN PATIENTS WITH CANCER

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**Rationale:** Our objective was to estimate the prevalence of symptoms of anxiety and depression in oncological inpatients, as well as its relationship with malnutrition.

**Methods:** Prospective study in patients hospitalized in Medical Oncology and Hematology wards. Subjective Global assessment (SGA) was done and data regarding anxious-depression symptomatology was obtained with the Hospital Anxiety and Depression Scale (HADS).

**Results:** 282 inpatients were assessed, 55.7% male and 44.3% female, with an average age of  $60.2 \pm 12.6$  years and a BMI of  $24.6 \pm 4.9$  kg/m<sup>2</sup>. SGA found 18.6% of well-nourished, 25.3% with moderate malnutrition and 56.1% with severe malnutrition.

HADS presented an average score of  $8.3 \pm 4.4$  points in respect to anxiety ( $8.0 \pm 4.5$  points in male vs  $8.7 \pm 4.3$  points in female) and an average score of  $7.7 \pm 4.6$  in respect to depression ( $7.5 \pm 4.8$  points in male vs  $7.8 \pm 4.3$  points in female). With these data, 54% of our patients showed a risk of anxiety and 45.3% showed a risk of depression.

In malnourished patients according to GSA, average score tended to be higher in respect to anxiety ( $8.5 \pm 4.3$  points in malnourished vs  $7.1 \pm 4.6$  in well-nourished;  $p = 0.06$ ) and was significantly higher in respect to depression ( $8.2 \pm 4.6$  points in malnourished vs  $5.3 \pm 4.0$  points in well-nourished;  $p < 0.001$ ).

In malnourished patients according to SGA the odds ratio of presenting anxious symptomatology was 2.4 times greater than in well-nourished [95% CI 1.2–4.9;  $p = 0.016$ ] and the odds ratio of presenting depression symptomatology in these patients was 3.5 times greater than in well-nourished [95% CI 1.6–7.8;  $p = 0.002$ ].

**Conclusions:** Anxious-depression symptomatology in oncological inpatients is high. There is a clear association between presenting anxious-depression symptomatology and malnutrition in hospitalized oncologic patients.

**Disclosure of Interest:** None declared.

#### PT07.3

### A CRITICAL ASSESSMENT OF CT AS A VALID MEANS OF SKELETAL MUSCLE ANALYSIS AND MUSCULAR BODY COMPOSITION ANALYSIS IN CANCER CACHEXIA

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**Rationale:** Recently, CT body composition analysis (BCA) as a means to assess skeletal muscle index (and thus sarcopenia) has been increasingly used in the diagnosis of cancer cachexia, and has been

proposed as an outcome measure in randomised trials. However, the validity of CT-BCA for these functions, and the relationship between CT-BCA variables, skeletal muscle protein content, and patient-reported outcome measures are largely unknown.

**Methods:** Patients were recruited from upper GI cancer (UGIC) (n = 89; M:F = 62:27), vascular (AAA) (52, 44:8), and live kidney donor (LDN) (53, 24:29) populations. CT-BCA was carried out at L3 level using validated semi-automated planimetry. Muscle biopsies were obtained intra-operatively and protein content analysed using the Pierce BCA method. Immunohistochemistry was performed to determine muscle fibre cross-sectional area. Quality of life was assessed using the EORTC QLQ-C30+OG25.

**Results:** In this body of work, salient findings include:

1. Unanticipated high incidence of sarcopenia in both AAA (>UGIC) and healthy control (LDN) populations.
2. Sarcopenia and cachexia can exist independent of reductions in patient functional status or quality of life.
3. Systemic inflammation, a key component of cancer cachexia, is associated with increases in tissue volume and reductions in tissue density due to oedema, thus making CT-BCA difficult to interpret.
4. Skeletal muscle protein content varies widely in UGIC, and only weakly correlates with muscle density.
5. Muscle fibre diameter appears maintained in slow fibres, and reflect underlying disease in fast twitch fibres

**Conclusions:** Although CT-BCA has been shown previously to be associated with cancer patient morbidity and mortality, there are clear areas in which the interpretation and applicability of this methodology are incompletely understood and potentially limited. Further work is required to assess whether CT-BCA is a valid and sensitive measure of alterations in patient body composition and protein levels during therapeutic intervention for cancer cachexia.

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#### PT07.4

### CLINICAL EFFECTS OF A PECTIN-CONTAINING OLIGOMERIC FORMULA IN TUBE FEEDING PATIENTS: A MULTICENTER RANDOMIZED CLINICAL TRIAL

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**Rationale:** A pectin-containing oligomeric formula (POF) is a unique type of enteral formula that transforms from a liquid to a gel after reacting with gastric acid. Reports on its clinical effects have been limited. The present study was conducted to examine and verify the clinical effects of POF.

**Methods:** The study subjects were 201 stable patients on intragastric tube feeding. They were randomized into two groups to receive either POF or a standard polymeric formula (SPF) as a control. The duration of observation was 1 week. Analyses were conducted for the incidence of predefined composite events, including diarrhea, defecation treatments, and other enteral nutrition management-related events.

**Results:** Composite events occurred in 15 of 98 patients in the POF group and 30 of 100 patients in the SPF group, with a significantly lower incidence in the POF group compared with the SPF group (P = 0.011). In particular, diarrhea occurred in 2 patients in the POF

group and 13 patients in the SPF group, with a significantly lower incidence in the POF group compared with the SPF group (P = 0.003).

**Conclusions:** The results of this study suggest that POF is less likely to cause enteral nutrition-related events, especially diarrhea, than SPF.

**Disclosure of Interest:** None declared.

#### PT07.5

### ASSOCIATION BETWEEN THE BODY MASS INDEX AND THE RELAPSE RATE IN PATIENTS WITH B-CELL PRECURSOR ACUTE LYMPHOBLASTIC LEUKEMIA

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**Rationale:** To identify the association between body mass index and the risk of relapse in adult patients with acute lymphoblastic leukemia of phenotype B.

**Methods:** Retrospective, observational study in patients with acute lymphoblastic leukemia of lineage B Ph + (-). The diagnosis was made with the presence of more than 20% of Blasts in the bone marrow and confirmed by flow cytometry. Relapse were considered if the patient at any time of their treatment increased 10% of blasts in the bone marrow. The BMI was calculated at the time of diagnosis. The Cox regression analysis was used to assess the associations between BMI and risk of relapse.

**Results:** A total of 128 patients were analyzed. According to BMI 37.5% were classified with a normal weight, 34.4% overweight, 18.8% obesity grade I, and 3.9% obesity grade III. The frequency of relapse to bone marrow was 43.8% (n = 56) and mortality was 42.2% (n = 54) throughout the follow-up. BMI  $\geq 30$  kg/m<sup>2</sup> did not behave as a risk factor for failure (OR: 0.888 (0.4074–1.9378), p = 0.766, 95% CI), even considering individually cases with a BMI greater than 30 kg/m<sup>2</sup> it was not considered as a risk factor associated with relapse (OR: 0.615 (0.1755–2.1588), p = 0.448, 95% CI).

**Conclusions:** Obesity defined as a BMI  $\geq 30$  kg/m<sup>2</sup> was not associated as an independent risk factor of relapse of mortality in adults patients with acute lymphoblastic leukemia. BMI should be considered a rough guide because it may not correspond to the same degree of fatness in different individuals.

**Disclosure of Interest:** None declared.

#### PT07.6

### CHANGES IN FTO AND IRX3 GENE EXPRESSION IN OBESE AND OVERWEIGHT MALE ADOLESCENTS UNDERGOING AN INTENSIVE LIFESTYLE INTERVENTION AND THE ROLE OF FTO GENOTYPE IN THIS INTERACTION

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**Rationale:** Lifestyle intervention may have a critical effect on the association between genetics and obesity. This study aimed to investigate the effects of lifestyle intervention on obesity-related genes in obese adolescents with different genotypes.

**Methods:** This study was a field trial of 62 adolescents from boys' high schools in Tehran, Iran. Two schools were randomly allocated as the intervention (n = 30) and control (n = 32) schools. The rs9930506 SNP in FTO was genotyped at baseline and the level of FTO and IRX3 expression in PBMCs. Anthropometric measurements were assessed at baseline and after 18 weeks of intensive lifestyle intervention.

**Results:** Our results showed that IRX3 expression in the intervention group was significantly up-regulated compared to baseline (P = 0.007) and compared to the control group (P = 0.011). The intervention group had significantly up-regulated transcripts of IRX3 only in rs9930506 risk allele carriers of the intervention group compared to risk allele carriers of the control group (P = 0.017). Moreover, our data showed that the FTO expression was up-regulated in AA genotype carriers and down-regulated in AG/GG genotype carriers. (P = 0.017).

**Conclusions:** Lifestyle modification may exert its effects on obesity through changes in the expression level of the FTO and IRX3 genes. However, FTO genotype plays a role in the extent of the effect of lifestyle changes on gene expression. Further studies are crucial to have a better understanding of the interaction between lifestyle, genetics and anthropometric measurements.

**Disclosure of Interest:** None declared.

## Vitamins, antioxidants and minerals

### PT08.1

#### VALIDATION OF INDUCTIVELY COUPLED PLASMA METHOD TO DETERMINE IRON TRACE LEVELS IN SOLUTIONS TO PREPARE NUTRITION PARENTERAL MIXTURES

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**Rationale:** A wide range of iron (Fe) levels have been found as impurities in the individual components (solutions) used to prepare Parenteral Nutrition (PN). This contamination must be taken into account due to the lipids possible destabilization, oxidation reactions on certain amino acids and vitamins and the Fe patient's requirements. However, no limits have been established.

**Objective:** Validate an optimized method in order to accurately determine iron traces using Optical Emission Spectroscopy – Inductively Coupled Plasma (ICP-OES) in several matrices used to prepare PN solutions.

**Methods:** Optical emission spectrometer (OPTIMA 8000, Perkin Elmer) was used to accurately determine Fe. Method was optimized and validated evaluating selectivity/ specificity, linearity (normality test, ANOVA test), repeatability, intermediate precision and bias. Reference materials and matrix certified reference material were used.

**Results:** Selected wavelength 239.562 nm allowed to discriminate spectral interferences the potentially present (as Cu, Zn, Co, Ni, Cr). Linearity was demonstrated by homogeneity of variances and normality test as by  $r^2 = 0.998$ ; Intermediate precision raised to 5%. Obtained quantification limit was 10 microgramos/L and recovery was

100,7%. Uncertainties associated to analytical determinations ranged between 10 to 20% depending on Fe levels present in the studied solutions.

**Conclusions:** Validation has demonstrated that the proposed method was selective, provides adequate uncertainties and it is useful to quantify quickly and accurately iron traces in matrices that can be converted to aqueous acid solutions. This would allow to suggest a limit for Fe used to prepare parenteral nutrition mixtures.

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**Disclosure of Interest:** None declared.

### PT08.2

#### DIETARY IODINE INTAKE AND URINARY IODINE CONCENTRATION IN NORWEGIAN HOME-DWELLING OLDER ADULTS

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**Rationale:** To describe the iodine status (the urinary iodine concentration (UIC) and the iodine intake from food) and dietary sources of iodine among adults ( $\geq 70$  years). Further, to investigate the effect of daily intake of milk on iodine status (UIC).

**Methods:** Subjects from a cross-sectional study (n 434) and a randomized controlled trial (RCT) (n 36) among Norwegian older home-dwelling adults ( $\geq 70$  years) were included. Iodine was quantified in spot urine and 24-h urine samples, and from 2 × 24-h dietary recall method.

**Results:** Women had significantly lower median (p25, p75) UIC than men (79 (53–129)  $\mu\text{g/L}$  v. 108 (74–155)  $\mu\text{g/L}$ , respectively,  $P < 0.001$ ). Additionally, UIC lower than 50  $\mu\text{g/L}$  was observed among 23% of women and 10% of men. Median (p25, p75) iodine intake was significantly lower in women compared to men (117 (79, 229) mcg/d v. 133 (94, 234) mcg/d, respectively,  $P = 0.033$ ). *Dietary sources of iodine and changes in the UIC from increased milk intake in the RCT will be presented at the poster at the ESPEN conference.*

**Conclusions:** According to WHO, Norwegian older women in the present study are defined as iodine insufficient (median  $< 100 \mu\text{g/L}$ , and  $> 20\%$  had UIC  $< 50 \mu\text{g/L}$ ) and men are defined iodine sufficient. According to the Nordic Nutrition Recommendations, both women and men had lower iodine intake than the recommended daily intake (150  $\mu\text{g/day}$ ).

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### PT08.3 THE EVALUATION OF THIAMINE DEFICIENCY IN PATIENTS WITH HYPERVOLEMIA UNDER THE FUROSEMIDE TREATMENT

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**Rationale:** Reportedly, thiamine deficiency, resulting from long-term diuretic therapy, is observed in patients with heart failure (HF). However, the effect of furosemide treatment on thiamine concentration is not clear in hypervolemic patients with chronic renal failure (CRF). The aim of this study was to assess thiamine deficiency in patients with hypervolemia (HF and/or CRF) under the furosemide treatment.

**Methods:** 61 hypervolemic patients with HF or CRF who treated with diuretics for the control of fluid overload in Kayseri City Training and Research Hospital, Nephrology, Cardiology and Internal Medicine department were included in this study. Hypervolemia was diagnosed according to echocardiography and physical examination findings (crepitant rales, acid, pretibial edema, pleural effusion). Whole blood sample was taken for the measurement of thiamine levels before treatment in patients who were planned to receive IV furosemide treatment (40–200 mg/day). While the patients continued to receive their treatment, blood was taken on the 2<sup>nd</sup> and 4<sup>th</sup> days for the control of thiamine levels. The normal range of thiamine concentration was regarded as 35–99 ng/mL. Thiamine deficiency was defined as <35 ng/mL. We evaluated the association between the change of blood thiamine concentrations and other clinical and demographic parameters.

**Results:** The mean age was 69.00 ± 10.39 years. This study included 32 patients with HF (52.5%) and 47 patients with CRF (77%). In 12 patients (19.7%), blood thiamine concentration was lower than the lower limit of normal (35 ng/mL; dotted line) at the time of the hospitalization. On the 4<sup>th</sup> day of treatment, thiamine deficiency was found in 44.3% (n = 27) patients. The mean thiamine levels in the blood samples was 51.71 ± 20.66 ng/mL at the time of the hospitalization, 47.64 ± 15.43 ng/mL at 2<sup>nd</sup> day after diuretic treatment and 43.78 ± 16.20 µg/ml at 4<sup>th</sup> day after diuretic treatment (*p* < 0.001). The change of thiamine levels with diuretic therapy was found statistically significantly differ in repeated measures variance analysis (*p* = 0.029). The change of thiamine levels in patients with HF was statistically significant between day 0 and 2th day and between day 0 and 4th day (*p* = 0.047 and *p* = 0.020). Thiamine levels in patients with CRF before treatment were observed to decrease from 52.02 ± 21.19 ng/mL to 43.76 ± 15.79 ng/mL on the 4th day and it was statistically significant (*p* = 0.036).

**Conclusions:** Our findings suggest that the furosemide treatment decreases the blood thiamine concentrations in patients with hypervolemia. When diuretic treatment is started for these patients, blood thiamine levels should be checked and thiamine support should be kept in mind for thiamine deficiency.

**Disclosure of Interest:** None declared.

### PT08.4 EFFECTS OF DIET-INDUCED REPETITIVE SPIKES IN PLASMA PHOSPHORUS ON VASCULAR CALCIFICATIONS IN RATS WITH MILD KIDNEY DYSFUNCTIONS

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**Rationale:** Since hyperphosphatemia induced by excess phosphorus (Pi) intake causes vascular calcifications, it is thought hyperphosphatemia is a major risk factor for cardiovascular disease in patients with chronic kidney disease. It was reported that repetition of short-term excessive Pi diet intakes caused transient plasma Pi elevations, we called Pi spikes, which resulted in vascular endothelial dysfunction in normal rats. The purpose of this study was to investigate whether repetitive plasma Pi spikes exacerbated vascular calcifications in rats with mild kidney dysfunctions.

**Methods:** As a mild kidney dysfunction model, rats receiving unilateral nephrectomies were used. The rats were divided into 3 groups; the CP group fed control Pi (0.6%) diet, the HP group fed high Pi (1.2%) diet, and the Pi spike group fed low Pi (0.02%) and high Pi diet alternately every 2 days. During the experiment period for 36 days, blood, urine and feces were collected, and Pi and calcium (Ca) concentrations were measured. At the end of the experiment, calcifications of the thoracoabdominal aortae were visualized by von Kossa staining, and then Ca contents of the aortae were evaluated.

**Results:** In the Pi spike group, plasma Pi levels fluctuated with alternative intakes of Pi diets. Although total amount of Pi intake of the Pi spike group (6.33 ± 0.16 g) was the same as the CP group (6.43 ± 0.09 g), the vascular calcifications of the Pi spike group had more severely progressed than those of the CP group, which were similar to those observed in the HP group. The Ca contents of the aortae in the Pi spike group were also significantly higher than those of the CP group (42.94 ± 3.64 µg/g tissue weight vs 19.65 ± 2.21 µg/g tissue weight, *p* < 0.05), which were nearly equal to those in the HP group (42.55 ± 9.26 µg/g tissue weight).

**Conclusions:** In the rats with mild kidney dysfunction, the vascular calcifications were exacerbated by repetitive plasma Pi spikes, despite the same amount of total Pi intake with those of the control group. It was suggested that diet of avoiding transient hyperphosphatemia (Pi spike) was important for prevention of vascular calcifications with mild kidney dysfunctions.

**Disclosure of Interest:** None declared.

### PT08.5 EFFECT OF ANTIOXIDANT SUPPLEMENTATION DURING ONCOLOGICAL TREATMENT ON SERUM HEMOGLOBIN LEVELS IN CERVICAL CANCER PATIENTS

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**Rationale:** Cervical cancer is the 4th most common type of cancer in women worldwide. In Mexico it is the second cause of death because of cancer among women. As much as 68% of cervical cancer patients experiment anemia and it is considered a poor prognosis factor. Antioxidant therapy in cancer is a controversial topic. It showed benefits in hemoglobin levels maintenance in cervical cancer during antineoplastic therapy. The research question was: ¿What is the effect of antioxidant supplementation at different doses on serum hemoglobin in cervical cancer patients during oncology treatment?

**Methods:** A randomized, controlled, single-blinded clinical trial was conducted in women with cervical cancer treated with radiotherapy and chemotherapy with cisplatin. Participants were divided into 3 groups (SP = single dose, SS = double dose and PP = placebo) to receive during antineoplastic treatment different dosages of antioxidants with: beta-carotene 4.8 mg; vitamin C 200 mg; vitamin E 200 UI; zinc 15 mg; selenium 50 mcg. A complete blood count and food frequency questionnaires were performed before and after the oncology treatment. A paired student-t test and ANOVA analysis were used to determine the differences between groups. To calculate sample size we used a power of 80% and a 95% of significance with a *p*-value < 0.05.

**Results:** We included 82 patients: 26 received SS (31.7%), 29 received SP (35.4%) and 27 received PP (32.9%). The SS group maintained significantly more stable their hemoglobin levels when compared with the PP (Table 1). All study groups showed a lower food intake at the end of oncological treatment.

**Table 1**

Serum Hemoglobin levels (g/dl) before and after the oncological treatment.

	Initial g/dl	Final g/dl	$\delta$ g/dl	p-Values	p-Values
SS	12.07 ± 2.3	11.51 ± 1.7	0.55 ± 1.39	.053*	0.041
SP	13.15 ± 1.5	12.01 ± 1.1	1.13 ± 1.14	.000*	
PP	13.16 ± 1.9	11.72 ± 2.61.8	1.44 ± 1.26	.000*	

Reference value: 12–16 g/dL.

\*p-values <0.05 for t student test.

\*\*p-values <0.05 for ANOVA.

**Conclusions:** Antioxidant supplementation helped to maintain hemoglobin levels during oncology treatment in cervical cancer patients. Food intake decreases during treatment. Both, vitamin E and selenium intake are lower than RDI (Recommended daily intake), therefore, patients need further supplementation to avoid negative side effects.

**Disclosure of Interest:** None declared.

#### PT08.6

##### DIAGNOSIS OF ELECTROLYTE AND MICROELEMENT IMBALANCE IN PATIENTS WITH ACUTE PANCREATITIS

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**Rationale:** The main purpose of our study was to investigate the levels of electrolytes and microelements in patients with acute pancreatitis in parallel with markers of systemic inflammatory response and protein-energy malnutrition.

**Methods:** We have analyzed 137 clinical cases of patients with acute pancreatitis, among them 86 men (62.8%) and 51 women (37.2%). The maximal age of enrollee was 55 years, the minimal age – 18 years (the mean age 38,7 ± 5,6 years). In all patients we estimated the severity of their condition using APACHE-II score and SOFA, moreover biochemical analysis were performed, the levels of electrolytes (K, Na, Cl) and microelements (Zn<sup>++</sup> и Cu<sup>++</sup>) were measured, acide-base balance analysed.

**Results:** Initially, disease severity in all patients with acute pancreatitis was determined as severe. The severity score obtained using APACHE-II was 12,25 ± 1,63, and using SOFA – 2.33 ± 0,78. All patients had profound leukocytosis 11,58 ± 3,03 × 10<sup>9</sup>/l, increased levels of CRP with mean levels up to 208,56 ± 53,63 mg/l (norm 0–6 mg/l). Notably, the level of CRP exceeded 150 mg/l in 93,7% of patients. The mean levels of Zn in plasma were about 4436,0 ± 857,1 mcg/l, Cu<sup>++</sup> – 786,0 ± 237,2 mcg/l. Reliable correlation (r = 0,56, p = 0,047) was found between the levels of Zn<sup>++</sup> and treatment outcomes in patients with acute pancreonerosis. In cases when the level of zinc exceeded 4500 mcg/l, the risk of death was approaching 100%. While analyzing the levels of electrolytes in plasma the following tendency was established: prognosis worsened in patients with hyponatremia (level of sodium lower than 130 mmol/l).

**Conclusions:** Hyperzincemia can be taken under consideration as a biochemical marker that reflects the severity of patients condition in

case of acute pancreatitis. The prognostic value of hyperzincemia in the evaluation of the treatment prognosis in patients with pancreonerosis needs to be investigated more thoroughly. Hyponatremia is another marker of disease severity in patients with acute pancreatitis, so infusion therapy in such patients should be thoroughly planned and controlled.

**Disclosure of Interest:** None declared.

## Nutrition and chronic disease/Vitamins, antioxidants and minerals

#### PT09.1

##### GUT MICROBIOTA PATTERN IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE (RELATED TO DIET, ACTIVITY DEGREE AND MALNUTRITION)

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**Rationale:** Modifications of gut microbiota have been described in relation to inflammatory bowel disease (IBD), dietary habits and nutritional status. We related gut microbial pattern of patients with IBD compared to healthy individuals; and link gut microbial pattern with activity of the disease, nutritional status and dietary habit.

**Methods:** Observational study of 56 subjects (44 with IBD and 12 controls). We collected clinical and analytical data (nutritional and inflammatory profile), anthropometric, dietary habits (record of 3 days) and microbial study (grouped by a dendrogram for Lactobacillus and the clusters were amplified by PCR).

**Results:** Mean age 44.7 ± 2.07 years (54.5% males). The disease ratio Crohn's disease (CD)/ulcerative colitis (UC) was 23/21. 38.6% presented remission of the disease and the rest had mild (27.3%), moderate (27.3%), severe activity (11.4%). 37% with activity had malnutrition and 76.9% had moderate or severe vitamin D deficiency (p = 0.025, 11.61 ± 5.42 vs 21.99 ± 1.81). In the analysis of gut microbiota we found greater similarity between controls and those patient in remission (M1 pattern). The other microbial pattern (M2) showed lower bacterial diversity (patients with higher use of corticosteroid therapy).

However, M1 had a higher vitamin D deficiency (75% vs 52.4%) and malnutrition (37.5% vs 22.7%). M2 was associated with the highest protein and carbohydrate intake: meat (p = 0.003, 60.63 ± 32.55 vs. 128.73 ± 10.26); dairy products (p = 0.040, 137.13 ± 64.43 vs 285.36 ± 34.28) and pasta (p = 0.049, 15.88 ± 8.62 vs 40.82 ± 8.23). However, malnourished patients took more vegetables (p = 0.024, 161.25 ± 43.1) and less fat products (p = 0.032, 74.84 ± 6.34 vs 92.93 ± 4.24).

#### Conclusions:

- Gut microbiota pattern changes according to diet. M2 (more Firmicutes and Proteobacteria and less Bacteroidetes).
- Active IBD (M2) is associated with a Western diet.
- The dietary influence on gut microbiota is greater than inflammatory pattern.

**Disclosure of Interest:** None declared.

### PT09.2 RISK FACTORS FOR NEPHROLITHIASIS IN ADULT PATIENTS WITH SHORT BOWEL SYNDROME

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**Rationale:** Patients with short bowel syndrome (SBS) were known to have an increased frequency of nephrolithiasis. However, few studies focusing on nephrolithiasis in SBS patients have been insufficiently studied. We aimed to identify potential risk factors for the formation of nephrolithiasis in adult patients with SBS.

**Methods:** All eligible adults diagnosed with SBS admitted to a tertiary referral center from December 2008 to December 2018 were retrospectively identified from a prospectively maintained database. SBS was defined as the length of the remaining small bowel less than 200 cm. Patients' demographic and clinical variables were analyzed using univariate and multivariate analysis to identify potential risk factors.

**Results:** Of 231 adults with SBS, 42 (18.2%) patients developed nephrolithiasis. The main age was  $46.4 \pm 17.8$  years, the main BMI was  $18.2 \pm 3.8$  kg/m<sup>2</sup> and the median duration of SBS was 11 months (range, 2–324). Multivariate binary logistic regression analysis revealed that patients with jejunio-ileal anastomosis and colon in continuity (odds ratio [OR], 4.335; 95% confidence interval [CI], 1.175–16.002;  $p = 0.028$ ), prolonged duration of SBS (OR, 1.008; 95% CI, 1.002–1.014;  $p = 0.010$ ) and increased serum creatinine concentration (OR, 1.005; 95% CI, 1.001–1.009;  $p = 0.012$ ) were independent risk factors associated with nephrolithiasis in adult SBS patients.

**Conclusions:** Nephrolithiasis remain a common complication in adult SBS patients. As nephrolithiasis can developed into adverse clinical consequence, closely monitoring and possible prophylactic interventions should be conducted in patients with SBS.

**Disclosure of Interest:** None declared.

### PT09.3 LONG-TERM EFFECT OF COLD PRESSED COCONUT OIL SUPPLEMENT ON LIPID PROFILES AMONG DYSLIPIDEMIA PATIENTS RECEIVING MODERATE INTENSITY STATINS, 6 MONTHS

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**Rationale:** Dyslipidemia is an important factor of atherosclerosis especially in coronary artery and cerebral artery. Guideline for dyslipidemia management recommends lifestyle modification and/or lipid lowering medications. However, many supplements being claimed for lipid reduction are widely used by patients. Nowadays, the results are still controversial and there was no study of cold pressed coconut oil capsule (CO) on dyslipidemia patients taking lipid lowering drugs. The aims of this study is to investigate the efficacy and safety of CO supplement in this group of patients.

**Methods:** This study is a non-blinded randomized control trial study. Participants were 82 dyslipidemia patients taking moderate-intensity statin. 42 were control group and the others took CO 1000 mg per day for 6 months. The lipid profiles, renal and liver function tests were measured at week 0, 12 and 24.

**Results:** No significant reduction of LDL level in study group compared to control group (95% CI – 18.985 to 5.719  $p = 0.211$ ), cholesterol level (95% CI – 12.967 to 16.477,  $p = 0.109$ ), triglyceride level (95% CI – 16.087 to 46.561,  $p = 0.198$ ) and HDL level (95% CI 0.331 to 12.822,  $p = 0.120$ ). Aspartate aminotransferase (95% CI – 2.035 to 6.889,  $p = 0.213$ ) and alanine aminotransferase (95% CI – 3.201 to

10.628,  $p = 0.450$ ) were no significant different among two groups. Also no significant in kidney function was seen between the groups (95% CI – 0.1 to 0.154,  $p = 0.723$ ).

**Conclusions:** There were no positive effect of CO supplement on reduced serum lipid in dyslipidemia patients taking lipid lowering. Nevertheless CO supplement do not effect liver and kidney function.

**Disclosure of Interest:** None declared.

### PT09.4 HPN PATIENTS WITH SEVERE GASTROINTESTINAL DYSMOTILITY HAVE SIMILAR CLINICAL OUTCOMES TO PATIENTS WITH SHORT BOWEL SYNDROME: A CANADIAN'S PERSPECTIVE

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**Rationale:** Severe gastrointestinal dysmotility (GID) makes up less than 20% of chronic intestinal failure requiring home parenteral nutrition (HPN) versus 75% in short bowel syndrome (SBS). Patients with GID have systemic consequences of their disease linked to negative clinical outcomes. The aim of our study is to characterize and compare the outcomes of these two populations using the Canadian HPN registry.

**Methods:** Using the password protected internet-based Canadian Home Parenteral Nutrition Registry, a prospectively recorded database, patients with GID and SBS were identified. The retrospective data of patients from 2003 to November 1st 2018 was considered. A total of 830 patients were recruited in the registry. Sixty-eight patients (22 male, 46 female) with a clear GID diagnosis and 218 patients (67 male, 151 female) with SBS were included in the final analysis. Parameters were compared between groups using Kruskal-Wallis test followed by Wilcoxon ranked sum or chi-square and Fisher's exact test as necessary. Kaplan-Meier was used to determine survival probability. To avoid left-truncation, only patients who started HPN after 2003 were included for survival analysis ( $n = 271$ ). Statistical significance was determined when  $p$ -value < 0.05 and results were expressed as median (3<sup>rd</sup> quartile; 1<sup>st</sup> quartile).

**Results:** When compared GID patients were younger with a median age of 47.0(60.0;33.0) vs 53(63.0;44.0) years  $p < 0.05$ . They had a smaller BMI 20.9 kg/m<sup>2</sup>(22.2;18.0) vs 21.0 kg/m<sup>2</sup>(24.2;19.2)  $p < 0.05$  and required PN for a longer amount of time 7.1(10.8;3.47) vs 2.5 (5.6;1.0) years  $p < 0.05$ . There were no differences in line sepsis per 1000 catheter days 0.0(0.5;0.0) vs 0.0(0.8;0.0), total number of hospitalizations 1.0(3.0;0.0) vs 2.0(3.0;0.0) or total number of HPN-related admission days 0.0(1.0;0.0) vs 0.0(5.0;0.0) between GID and SBS patients. Actuarial survival probability for GID and SBS patients was similar with 72.3% vs 78.8% at 5 years and 61.8% vs 64.2% at 10 years. The overall population had a median age of 52.0(62.0;42.0) years and a median BMI of 21.0(23.3;19.0) kg/m<sup>2</sup>. The median PN duration was 3.2(7.2;1.3) years with 0.0(0.8;0.0) line sepsis per 1000 catheter days, 2.0(3.0;0.0) hospitalizations, 0.0(1.0;0.0) admissions related to HPN and a median number of HPN related admission days of 0.0(4.0;0.0). Overall actuarial survival was 76.8% and 63.2% at 5 and 10 years.

**Conclusions:** In this large Canadian national study of HPN patients there was no difference in 5 and 10 year survival between GID and SBS despite SBS patients being older. SBS patients had a shorter PN duration likely due to the use of surgical and medical options enabling them to gain enteral autonomy. Overall survival was similar to other HPN centers.



**Reference**

1. Acknowledgement to all the members of the Canadian HPN registry Casselman S; Gramlich L; Whittaker S; Armstrong D; Jurewitsch B; Boudreault MF; Raman M; Duerksen D; Stevenson D, Raman M.

**Disclosure of Interest:** None declared.

**PT09.5****EVALUATION AND PREDICTION AND OF RESTING ENERGY EXPENDITURE IN ADULT CROHN DISEASE**

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**Rationale:** The aim of this study was to compare resting energy expenditure (REE) measured (MREE) by indirect calorimetry (IC) and REE predicted (PREE) from established predictive equations in a cohort of adult patients with Crohn diseases.

**Methods:** We evaluated 198 Crohn patients (males 119, females 79) aged between 18 and 65 years (M: age  $36.8 \pm 12.9$  y, weight  $66.5 \pm 10.3$  kg, BMI  $22.4 \pm 3.4$  kg/m<sup>2</sup>, REE  $1673 \pm 218$  kcal, QR  $0.81 \pm 0.07$ ; F: age  $38.8 \pm 14.2$  y, weight  $56.0 \pm 9.4$  kg, BMI  $22.0 \pm 3.7$  kg/m<sup>2</sup>, REE  $1351 \pm 171$  kcal, QR  $0.81 \pm 0.08$ ). Data were obtained by comparing MREE with PREE, derived from different equations, within and between normal weight and obese groups. The mean differences between PREE and MREE as well as the accuracy prediction within  $\pm 10\%$  level were investigated in the whole sample.

**Results:** We observed that in men Schofield, FAO, and Marra equations provided good mean PREE-MREE (bias  $-0.2$ ,  $-0.4$  and  $1.8\%$ ; root mean standard error (RMSE) 139, 138 and 132 kcal per day, respectively); in women, HB, Schofield, FAO equations provided good mean PREE-MREE (bias  $-1.3$ ,  $-2.9$  and  $1.9\%$ ; root mean standard error (RMSE) 109, 123 and 120 kcal per day, respectively);

in men, prediction accuracy individually was low ( $\sim 70\%$ ) for all predictive equations; only FAO, Schofield and Mifflin was over 60% (68%, 65% and 62%).

in women, overall, prediction accuracy was low ( $\sim 55\%$ ) individually for all predictive equations considered; only Harris and Benedict equation reached the 68%.

**Conclusions:** Different established equations can be used for estimating REE at the population level in both sexes. However, the accuracy was very low for all predictive equations used, particularly among females limiting their use in clinical practice. Our findings suggest that the validation of new predictive equations would improve the accuracy of REE prediction in Crohn' diseases and it could be useful for nutritional monitoring

**Disclosure of Interest:** None declared.

**PT09.6****VITAMIN K1 STATUS IN PATIENTS UNDERGOING MAINTENANCE HEMODIALYSIS**

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**Rationale:** Vascular calcification is a serious complication in hemodialysis patients associated with high risk of cardiovascular events. A preventive role for vitamin K against vascular calcification progression has been proposed on the basis of its role in activating matrix gla protein (MGP), which is a calcification inhibitor in vascular tissue.

The aim of the study was an assessment of serum level of vitamin K1 in correlation to matrix Gla proteins level and nutritional status.

**Methods:** 143 people (62 F, 81 M) aged  $64.7 \pm 15.5$  years underwent chronic hemodialysis were examined. Nutritional status was assessed according to SGA, s-albumin and BMI. The status of vitamin K1 was assessed by measurement of serum concentration of phyloquinone – vitamin K1 (LC MS method) and MGP, ucMGP (ELISA methods). The other biochemical parameters were measured by routine laboratory methods. n PCR was calculated.

**Results:** The mean BMI was  $25.1 \pm 6.4$  kg/m<sup>2</sup>. Underweight was diagnosed in 5.2% of patients, and normal body weight in 23.3%. According to SGA, 24.6% of the subjects were mild/moderate malnourished. Low level of vitamin K1 (median = 0.56 ng/ml) was noticed in 46.1% HD patients and it was associated with higher CRP ( $p < 0.01$ ). The concentration of vitamin K1 correlated with MGP ( $R = 0.4$ ;  $p < 0.05$ ), time of dialysis treatment ( $R = -0.35$ ;  $p < 0.05$ ) and no correlated to nutritional indices.

**Conclusions:** Haemodialysis patients have subclinical vitamin K deficiency, as indicated by reduced serum K1, it was associated with the duration of dialysis and the presence of inflammation.

**Disclosure of Interest:** None declared.

## Nutritional assessment/Protein and amino acid metabolism/Nutrition and cancer

**PT10.1****SARCOPENIA AND INFLAMMATION IN CANCER PATIENTS AT DIAGNOSIS**

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**Rationale:** Sarcopenia is associated with poor oncological outcomes and inflammation plays an important role in prognosis worsening. The aim of our study was to evaluate the nutritional status in newly diagnosed cancer patients (pts) and detect both sarcopenia and inflammation.

**Methods:** We prospectively enrolled pts with advanced solid tumours candidate to first-line chemotherapy. Before starting any treatments, we assessed nutritional status by anthropometric, body composition and systemic inflammation measurement collection: weight loss (WL) in the previous 6 months, body mass index (BMI), skeletal muscle index (SMI) using analysed images of computed tomography (CT) and neutrophil-to-lymphocyte ratio (NLR). WL  $> 10\%$  was chosen as malnutrition criteria;  $SMI < 38.5 - 52.4$  cm<sup>2</sup>/m<sup>2</sup> for female and male pts respectively as cut-off point of sarcopenia;  $NLR \geq 4$  to define high inflammation. Statistical analysis was performed with Fisher's exact test and t-Test. Data are given as mean  $\pm$  SD.

**Results:** 68 pts were assessed: 40M/28F; average age  $59 \pm 13$  years and BMI  $23 \pm 4$  kg/m<sup>2</sup>; 41 (60%) upper gastrointestinal, 11 lung, 9 colorectal, 1 breast and 6 other cancers. According to selected criteria, 49 pts (72%) were sarcopenic and 19 (28%) non sarcopenic. 35 (71%) sarcopenic pts had WL  $> 10\%$  and 20 (57%) of those had  $NLR \geq 4$ . WL  $> 10\%$  was reported in 10 (53%) non sarcopenic pts and 2 (20%) of

those had high NLR. Overall, 29 (43%) pts were both sarcopenic and inflamed. Sarcopenic pts presented BMI lower than non sarcopenic pts ( $p = 0.001$ ) and NLR higher ( $p < 0.05$ ).

**Conclusions:** Our results suggest that body composition and systemic inflammation measurements, derived from existing routine exams for diagnostic purposes, can bring an added value to the nutritional assessment of oncological pts. Cancer-related malnutrition is well known but further studies are required to define an adequate nutritional intervention reversing sarcopenia and inflammation effects.

**Disclosure of Interest:** None declared.

#### PT10.2 DEVELOPMENT OF TOOLS TO ASSESS DIETARY FIBER INTAKE TAKING INTO ACCOUNT PREBIOTIC (OLIGO)SACCHARIDES

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**Rationale:** The scientific rationale for the recommendation in dietary fiber (DF) intake comes from the recognition of their health benefits. Gut microbiota related health benefits are not yet included in the current dietary recommendations. Quantitative and qualitative analysis of DF are missing in food composition tables. The FiberTAG<sup>1</sup> project aimed to develop a database and a food frequency questionnaire (FFQ) allowing DF intake estimation including prebiotic (oligo)saccharides.

**Methods:** A database of total, soluble and insoluble DF in food products consumed in Europe has been established based on the Souci-Fachmann-Kraut database, completed for soluble *versus* insoluble DF and for prebiotic (oligo)saccharide levels following published data. The FiberTAG FFQ was submitted to healthy volunteers ( $n = 15$ ) and DF intakes were calculated using the new FiberTAG database.

**Results:** The new FiberTAG database detailed DF in 400 food items allocated into 4 categories (fruits, vegetables, cereal products and others) and 15 subcategories. The new fiberTAG FFQ presents 280 items regrouped in 4 high DF-containing food groups (vegetables, fruits, cereal products and others) using frequency scale (6 categories), photographs for portion size and taking into account the seasonal occurrence for some vegetables or fruits. Mean DF intake was 36.44 g/day when applying the FiberTAG FFQ and the new database. This reveals a higher DF intake compared to previously reported intake for adults in Europe ranging from 16 to 24 g/d based on 24 h-recall or 3–7 days records<sup>2</sup>. This difference might be explained by a more adequate inclusion of fruits and vegetables intake in FFQ than with other methods, as previously reported<sup>3</sup>. Estimation for fructan, inulin and fructo-oligosaccharides intakes were 4.18, 2.95 and 1.00 g/day, respectively whereas galacto-oligosaccharides intake was 0.28 g/d.

**Conclusions:** The new FiberTAG database and FFQ are tools to evaluate prebiotic (oligo)saccharides intakes together with DF intake by healthy volunteers. The FiberTAG project generates scientific knowledge that helps to take into account nutrients interacting with gut microbiota to establish DF intake recommendations.

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**Disclosure of Interest:** None declared.

#### PT10.3

#### NUTRITIONAL STATUS ASSESSMENT IN OLDER PATIENTS WITH CANCER: A NATIONAL CROSS-SECTIONAL SURVEY (NUTRIAGECANCER)

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**Rationale:** Weight loss is common in older cancer patients and strongly associated with poor outcomes. We aim to assess weight loss (WL) in this population and identify associated factors.

**Methods:** A national cross-sectional survey (59 geriatric oncology clinics, France) of older cancer patients,  $\geq 70$  years (inclusion periods: November–December, 2017 and 2018). Demographic and clinical data were collected; a geriatrician performed nutritional assessment. Primary outcome: WL within the last six months precedent cancer treatment: minimal ( $\leq 5\%$ ); moderate ( $> 5\%$  and  $< 10\%$ ); severe ( $\geq 10\%$ ). Factors studied included age, gender, family situation, in/out patients, cancer site, metastatic status, previous anticancer treatment ( $< 12$  months), performance status (ECOG-PS), Timed Up and Go test (TUG), Activities of Daily Living (ADL), sarcopenia (SARC-F score<sup>1</sup>), hand grip strength test, dental health, dysgeusia, upper arm circumference, body mass index (BMI), food intake, comorbidities (updated Charlson index), number of medications, Mini Mental State Examination (MMSE) and mini-Geriatric Depression Scale (GDS 4 items).

**Results:** A total of 1105 patients were included (median age 83 yrs. [interquartile range, IQR 79–87]; males, 49%; metastasis, 41%; main cancer sites: digestive (27%), breast (16%). In total, 225 patients (20%, IQR 18–23) had moderate WL and 288 (26%, 23–29), severe WL. In multivariate analysis, female ( $p < 0.004$ ), overweight ( $p < 0.05$ ), obese ( $p < 0.008$ ), and patients with breast ( $p < 0.03$ ), urologic ( $p < 0.006$ ) and hematologic cancers ( $p < 0.04$ ) (compared with colorectal), were less likely to have moderate or severe WL. Patients with poor performance status ( $PS \geq 2$ ), low body mass index ( $BMI < 22.5 \text{ kg/m}^2$ ), low food intake ( $\leq 2/3$  of last meal), low mobility (TUG test) (all  $p < 0.001$ ) or depression risk ( $p = 0.02$ ), were more likely to have moderate or severe WL. Patients with congestive heart failure (CHF) were more likely to have moderate WL ( $p = 0.01$ ); those with upper gastro-intestinal (GI) tract cancers (liver and pancreas included) or previously treated for their cancer, were more likely to have severe WL ( $p < 0.03$ ). In sensitivity analysis, when replacing the TUG test and/or PS with the SARC-F score, sarcopenia was only associated with severe WL ( $p < 0.026$ ).

**Conclusions:** Near half of older cancer patients managed in geriatric oncology clinics had lost more than 5% of body weight in the last six months. Male gender, upper GI tract cancer, poor PS, poor mobility, depression risk, CHF, low BMI and low food intake were associated with weight loss.

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## PT10.4

### ASSOCIATION OF HANDGRIP STRENGTH WITH MALNUTRITION INFLAMMATION SCORE IN MAINTENANCE HEMODIALYSIS PATIENTS

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**Rationale:** Protein-energy wasting (PEW) is common in patients with end-stage renal disease on maintenance hemodialysis (HD) patients and is associated with increased morbidity, + mortality and poor quality of life. Anthropometry assessment, nutritional screenings, biochemical parameters and body composition measurement methods are used for early diagnosis of malnutrition. Handgrip strength (HGS) is related to nutritional assessment with Malnutrition inflammation score (MIS) and biochemical parameters; we investigated to verify best cut-off point of the HGS, which predicted the value of MIS > 5, which determines survival in both sexes

**Methods:** This was a cross-sectional study including 132 maintenance hemodialysis patients (73 male, age 56 ± 13,7) in the hemodialysis unit of Kayseri Education Research Hospital. Biochemical parameters including albumin, protein, creatinine, blood urea nitrogen, total cholesterol, CRP ve ferritin of the last 3 months were respectively collected. A physician performed the MIS test and modified Charlson comorbidity index (CCI) questionnaire. Handgrip strength was measured on the nonfistula side before dialysis session using a hand dynamometer (Takei 5401).

**Results:** HGS differs between male and women ( $p < 0,001$ ). Thus, patients were divided into low and high HGS according to the gender-specific median HGS values. It was revealed that there was significant relationship between age, CCI, MIS and gender-specific median HGS values (respectively  $p = 0,001$ ,  $p = 0,001$  and  $p < 0,001$ ). A correlation analysis revealed that HGS values were positively correlated with weight ( $r = 0,190$ ;  $p < 0,001$ ), height ( $r = 0,348$ ;  $p < 0,001$ ), albumin ( $r = 0,349$ ;  $p < 0,001$ ), creatinine ( $r = 0,374$ ;  $p < 0,001$ ) and in negative correlation with age ( $r = -0,352$ ;  $p < 0,001$ ), ferritin ( $r = -0,199$ ;  $p < 0,022$ ), CCI scores ( $r = -0,350$   $p < 0,001$ ) ve MIS value ( $r = -0,619$ ,  $p < 0,001$ ). In multivariate regressions, adjustment for age, weight, height, creatinine, albumine, ferritin levels did not materially diminish these relationships. The optimized cutoff point of HGS for MIS > 5 was 29,1 kg for men (sensitivity = 72,5%; specificity = 63,6%) and 20,1 kg for women (sensitivity = 63,5%; specificity = 57,1%).

**Conclusions:** Lower HGS values were independently associated with higher MIS among patients on maintenance HD. We recommend using it for early diagnosis and follow-up of PEW because HGS is a noninvasive, cheap, radiation-free, simple and objective

**Disclosure of Interest:** None declared.

## PT10.5

### POSITIVE EFFECTS OF BREAD ENRICHED WITH B-GLUCANS OR RESISTANT STARCH ON POSTPRANDIAL GLUCOSE, INSULIN AND GHRELIN RESPONSES OF HEALTHY SUBJECTS

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**Rationale:** Efforts regarding the amelioration of postprandial glucose and insulin responses to bread remain a priority in nutrition research since they can result to significant beneficial effects for health. Beta-glucans and resistant starch are known for their effects on improvement of glucose tolerance and enhancement of insulin sensitivity. Enrichment of bread with two different types of dietary fibers was performed to examine potential postprandial benefits.

**Methods:** Ten healthy normoglycemic adults participated in the study and were provided with either a solution of glucose (reference food) or bread enriched with beta-glucans (BG) or bread enriched with resistant starch (RS), with 1-week intervals in amounts that yielded 50 g of available carbohydrates. Venous blood samples were collected before consumption and at 15, 30, 45, 60, 90, 120 and 180 min postprandially. Glucose, insulin and ghrelin responses as well as glycemic index (GI) and subjective appetite ratings were evaluated.

**Results:** Ingestion of BG and RS elicited lower incremental area under the curve (iAUC) for 120-min glycemic response compared to the solution of glucose ( $P < 0.05$ ). Both breads demonstrated a low GI. A significantly lower desire to eat and higher fullness were detected 30 minutes after BG and RS consumption and until 180 minutes ( $P < 0.05$  compared to glucose). There were no significant differences in insulin response or ghrelin suppression among the two breads.

**Conclusions:** Enrichment of bread with beta-glucans or resistant starch induces similar effects on glucose, insulin and ghrelin responses and offers a lower desire for the next meal. The development of bread products which cause improved metabolic effects is of great importance for the promotion of public health.

**Disclosure of Interest:** None declared.

## PT10.6

### IMPAIRED AMINO ACID AVAILABILITY AND MUSCLE PROTEIN SYNTHESIS RATES AFTER MEAL INGESTION IN MAINTENANCE HEMODIALYSIS PATIENTS

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**Rationale:** Skeletal muscle loss is common in patients with renal failure receiving maintenance hemodialysis (MHD) therapy. Regular ingestion of protein-rich meals are recommended to help offset muscle protein loss in MHD patients, but little is known about the anabolic potential of this strategy.

**Methods:** Eight MHD patients (age: 56 ± 5 y; BMI: 32 ± 2) and eight non-uremic controls (age: 50 ± 2 y; BMI: 31 ± 1) received primed continuous L-[ring-<sup>2</sup>H<sub>5</sub>]phenylalanine and L-[1-<sup>13</sup>C]leucine infusions with blood and muscle biopsy sampling on a non-dialysis day.



Participants consumed a mixed meal (546 kcal; 20 g protein, 59 g carbohydrates, 26 g fat) with protein provided as L-[5,5,5-<sup>2</sup>H<sub>3</sub>]leucine labeled eggs.

**Results:** Circulating dietary-amino acid availability was reduced in MHD patients (41 ± 5%) vs. controls (61 ± 4%;  $P=0.03$ ). Basal muscle caspase-3 protein content was elevated ( $P=0.03$ ) and LAT1 protein content was reduced ( $P=0.02$ ) in MHD patients vs. controls. Basal muscle protein synthesis (MPS) was ~2-fold higher in MHD patients ( $0.030 \pm 0.005\% \cdot h^{-1}$ ) vs. controls ( $0.014 \pm 0.003\% \cdot h^{-1}$ ) ( $P=0.01$ ). Meal ingestion failed to increase MPS in MHD patients (absolute change from basal:  $0.0003 \pm 0.007\% \cdot h^{-1}$ ), but stimulated MPS in controls ( $0.009 \pm 0.002\% \cdot h^{-1}$ ;  $P=0.004$ ).

**Conclusions:** MHD patients demonstrate muscle anabolic resistance to meal ingestion. This blunted postprandial MPS response in MHD patients may relate to high basal MPS resulting in a stimulatory “ceiling effect” and/or reduced plasma dietary amino acid availability after mixed meal ingestion.

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## Nutrition and cancer

### PT11.01

#### ASSOCIATION BETWEEN GROWTH AND DIFFERENTIATION FACTOR (GDF)-15 SERUM LEVELS, ANOREXIA AND SARCOPENIA IN GASTROINTESTINAL AND LUNG CANCER PATIENTS

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**Rationale:** The pathophysiology of cancer anorexia and sarcopenia is not completely clarified. Different serum biomarkers, including some growth and differentiation factors, may be modulated during cancer and likely associated with an anorexic and sarcopenic phenotype.

The aim of our study was to explore the potential association(s) between the serum levels of GDF-15, anorexia and sarcopenia in patients with gastro-intestinal (GI) and lung cancer.

**Methods:** We considered patients with GI (gastric, pancreatic and colorectal) and lung cancer, at their first diagnosis, with or without anorexia and sarcopenia, and healthy matched controls. Radiological evaluation of skeletal muscle mass by computed tomography scan (L3 SMI) was used to diagnose sarcopenia in cancer patients and GDF-15 serum levels were assessed by ELISA in all the participants. The Functional Assessment of Anorexia/Cachexia Therapy (FAACT) questionnaire was administered to all patients to detect the presence of anorexia. Parametric and non-parametric tests were performed, appropriate.

**Results:** 38 cancer patients and 19 controls were enrolled. GDF-15 serum levels were significantly higher in cancer patients with respect to controls ( $P=0.007$ ). Anorexic patients (34%, by FAACT score  $\leq 21$ ) showed higher GDF-15 levels with respect to non-anorexic ( $P=0.03$ ). The prevalence of sarcopenia was 52.6%. Sarcopenic patients showed higher GDF-15 levels compared to non-sarcopenic cancer patients ( $P=0.02$ ). Moreover, GI cancer patients showed higher GDF-15 levels compared to lung cancer patients ( $P=0.009$ ).

**Conclusions:** Our data suggest an involvement of GDF-15 in the pathogenesis of cancer-associated anorexia and sarcopenia, in particular in GI tract cancer, with mechanisms to be further elucidated.

**Disclosure of Interest:** None declared.

### PT11.02

#### AN IRISH PATIENT SURVEY OF NUTRITION ATTITUDES & ACCESS TO DIETETIC CARE THROUGHOUT THE CANCER JOURNEY

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**Rationale:** The attitudes of cancer patients towards nutrition and nutrition care has never been captured in Ireland. An awareness of the nutritional needs and attitudes of cancer patients along with a review of their experiences would help inform service planning.

**Methods:** In September 2018, a national survey was conducted to examine patient attitudes towards nutrition and access to dietetic services during their cancer journey. Patients diagnosed or treated in Ireland since 2015 were asked to complete a 25-item survey (available online and at 20 hospitals across Ireland).

**Results:** In total, 1085 valid responses were received (63% female, mean age 58 years). All major cancer groups were represented & 33% had metastatic disease. Overall, 45% reported suffering from a diet-related problem and 44% reported weight loss since diagnosis. Muscle loss was noted by 52%. Amongst weight losers, 42% were “unhappy/worried” while 27% reported being “delighted/happy.” Although 80% are “always/usually” weighed in clinic, just 43% reported that they are “always/usually” asked about diet. Nutrition was rated “very/extremely” important by 89% of respondents. Only 39% had received dietary advice from a dietitian and 74% rated this advice as “very/extremely” helpful. Overall, 57% of those who did not see an RD said they would have liked more support with diet. While 58% reported trying general healthy eating as a result of their diagnosis, 38% and 32% admitted trying at least one alternative dietary strategy or avoiding a specific food due to their diagnosis, respectively.

**Conclusions:** While nutrition is highly important to Irish cancer patients, fewer than half surveyed had accessed a dietitian. Weight and muscle loss are common, but their significance is not always understood by patients. Almost half used alternative dietary strategies, highlighting the need to screen oncology patients for potentially restrictive diet or supplement use to guide appropriate referrals and education.

**Disclosure of Interest:** None declared.

### PT11.03

#### PREOPERATIVE IMMUNONUTRITION COMPARED TO STANDARD NUTRITIONAL SUPPORT AFFECTS THE INFLAMMATORY RESPONSE WITHIN THE COLORECTAL CANCER TISSUE – RANDOMIZED CONTROLLED TRIAL

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**Rationale:** The first choice of treatment in colorectal cancer is surgery. Nutritional support in form of oral nutritional supplements (ONS) in the preoperative period is widely accepted in reducing the amount of

perioperative complications and immunonutrition is generally recommended. However, there is little clinical data regarding the impact of such treatment on a tumor biology. Therefore we designed a study comparing the effect of immunonutritional and standard ONS treatment on altering the expression of inflammatory response cytokines in colorectal cancer tissue.

**Methods:** 26 patients who underwent laparoscopic colonrectal resection due to cancer were included into the study. None of them underwent preoperative radiochemotherapy. In all patients, tumor samples were collected during colonoscopy at the time of diagnosis (samples A). Next, randomization to 2 groups was performed. The group 1 consisted of patients who, as part of standard preparation, used standard ONS (3 × Nutricia Nutridrink per day) for 2 weeks before surgery. In group 2 ImmunoONS (2 × Nestle Impact Oral) was administered. Tumor tissue (samples B) was then retrieved after resection. The material was analyzed in luminex method for proteins expression (TNF- $\alpha$ , CXCL8, SDF-1a, CXCL6, CXCL2, MPO, CXCL1).

**Results:** Pre-operatively, the groups did not differ in terms of demographic parameters and tumor staging. There were no differences in the expression of any of the analyzed proteins in the pre-operative period (samples A). A statistically significant change in the difference of expression of TNF- $\alpha$  was observed between the groups [group 1 (35.68 vs 21.54); group 2 (27.79 vs 31.63)  $p = 0.049$ ] and CXCL1 [group 1 (2144.59 vs 953.75); group 2 (1902.86 vs 2698.27)  $p = 0.032$ ]. The levels of remaining cytokines did not differ.

**Conclusions:** Immunonutrition in preoperative period compared to standard nutritional support may influence inflammatory cytokine expression in the tumor tissue in patients with colorectal cancer. Farther studies are needed to establish real influence of immunonutrition in colorectal cancer tissue.

**Disclosure of Interest:** None declared.

#### PT11.04 MALNUTRITION IN CANCER PATIENTS: CAN PATIENTS BE IDENTIFIED SOONER?

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**Rationale:** Malnutrition is a predictor of outcome in patients' with cancer diagnosis<sup>1</sup>. Preventing malnutrition aims to maintain skeletal muscle mass, reduce interruptions in treatment, and improve quality of life. The aim of this study was to compare the Malnutrition Screening Tool (MST)<sup>2</sup> with an amended form of the screening tool to investigate if cancer patients at risk of malnutrition could be identified sooner.

**Methods:** Participants were screened for malnutrition using both the MST and an amended form of this screening tool. Eligible participants ( $\geq 18$  years, and undergoing chemotherapy treatment: newly diagnosed and those with established malignancy were accepted – irrespective of cancer type) were recruited from an outpatient oncology day ward. A scoring system was used to highlight those at risk of malnutrition. The MST was scored on weight loss and reduced appetite, while the amended MST was scored on weight loss, reduced appetite and the common side effects of cancer treatment (nausea, taste changes, dysphagia, xerostomia, diarrhoea, constipation and vomiting). The amended screening tool was validated against the MST using the statistical values of sensitivity, specificity, positive predictive values (PPV), and negative predictive values (NPV).

**Results:** A total of 151 oncology outpatients were included in this research (median age: 52 years; mean weight: 74 kg; mean BMI: 26.9 kg/m<sup>2</sup>). Using the MST 24% of participants were deemed at risk of malnutrition. Using the amended MST 42% of participants were deemed at risk of malnutrition. Reduced appetite (73%) and weight loss (67%) were the main risk factors, followed by taste changes (33%),

nausea and vomiting (26%). The amended MST had a 100% sensitivity against the MST and 100% NPV.

**Conclusions:** Side effects of cancer treatments may be a precursor of malnutrition. Using the amended MST, an additional 18% of patients were highlighted to be at risk of malnutrition when compared with the MST. The excellent sensitivity and NPV of the amended screening tool supports the tool in its ability to detect malnutrition and correctly highlight those not to be at risk of malnutrition.

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**Disclosure of Interest:** None declared.

#### PT11.05 BODY MASS INDEX AND INVASIVE BREAST CANCER PROGNOSIS: STUDY OF 1,638 LOCALLY BREAST CANCERS

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**Rationale:** Breast cancer (BC) is the first cause of death by cancer in women. Overweight and obesity, evaluated by the body mass index (BMI), are associated with an increased risk of postmenopausal BC, especially hormone receptor-positive cancers. BMI is associated with a more aggressive or advanced BC regardless of menopausal status but the link with classical BC prognosis factors is unknown. The aims of our study were: i) to compare the invasive BC initial prognostic factors and evolution in women according to BMI and menopausal status, ii) to study the survival according to the BMI, iii) to search the factors associated to BC recurrence.

**Methods:** We included all women with locally invasive BC diagnosed between 2004 and 2013 at the University Hospital Center of Limoges. Menopausal status, BMI at the time of diagnosis, tumor characteristics (histological type, urokinase plasminogen activator and plasminogen activator inhibitor-1, estrogen receptor, progesterone receptor-positive), treatment, and evolution of patients were collected. We compared two BMI groups ( $>25$  and  $<25$  kg/m<sup>2</sup>) and two menopausal statuses (pre and post-menopausal). Statistical tests used were Student's *t*-test, chi-square test, multivariate regression analysis using logistic regression and Kaplan-Meier analysis.

**Results:** In total, 1,638 women were included. More tumors of premenopausal women with BMI  $\geq 25$  kg/m<sup>2</sup> were urokinase plasminogen activator and plasminogen activator inhibitor-1-positive (77.8% vs. 47.1%,  $p = 0.009$ ) and the percentage of metastatic recurrences was greater (93.3% vs. 53.6%,  $p = 0.008$ ) compared to patients with BMI  $< 25$  kg/m<sup>2</sup>. Tumors of postmenopausal women with BMI  $\geq 25$  kg/m<sup>2</sup> were more estrogen receptor-positive (87.9% vs. 82.2%,  $p = 0.008$ ), progesterone receptor-positive (61.3% vs 49.2%,  $p = 0.0003$ ), and more luminal A subtypes (69.5% vs. 66.5%,  $p = 0.04$ ). According to the BMI the overall survival was not significantly different. The multivariate analysis did not find factors associated to BC recurrence.

**Conclusions:** Biomarker results may explain different prognoses in patients with invasive BC according to BMI and menopausal status. The nutritional status of women is an important parameter to consider in BC. Excess weight must be screened at diagnosis and during

follow-up to allow appropriate nutritional care in addition to the usual BC treatments.

**Disclosure of Interest:** None declared.

#### PT11.06

### IS HOME PARENTERAL NUTRITION BURDENSOME IN ADVANCED CANCER PATIENTS WITH MALIGNANT BOWEL OBSTRUCTION? A RETROSPECTIVE ANALYSIS IN AN UK INTESTINAL FAILURE CENTRE

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**Rationale:** Use of home parenteral nutrition (HPN) in advanced cancer patients with malignant bowel obstruction (MBO) who have lost their nutritional autonomy and developed intestinal failure (IF), is controversial. Controversies relate to financial, cultural, and ethical issues, including the risk that HPN is burdensome for the patient and their carer. We examined what burdens are placed when HPN is initiated.

**Methods:** Retrospective cohort study of adults admitted to University College London Hospital with MBO and started on HPN between 1.1.16 and 31.12.16 with readmissions until 31.12.17. Data were analysed using mean (SD), median (min-max) and proportions (%). Survival was examined using Kaplan Meier curves.

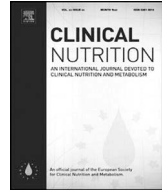
**Results:** We identified 10 patients with 20 MBO admissions who were commenced on HPN (mean±SD age: 55.3 ± 13.9 yrs, 80% female). Primary malignancies were 50% gynaecological and 50% lower GI cancers with metastases (70% in lower- and 30% upper-lower-diaphragm area). Median weight and BMI on admission were normal (54.8 kg, 42–87 kg; 19.1 kg/m<sup>2</sup>, 15–33), though, patients presented

with significant weight loss (9.1%, 3.8–21.1%). Weight at 0–3- and 3–6-month follow-up was 54 kg and 55.4 kg. HPN was more likely to be set-up on the 2<sup>nd</sup> admission with BO (HPN set up on: 1<sup>st</sup> n = 3; 2<sup>nd</sup> n = 5 and 3<sup>rd</sup> admission n = 2). HPN delayed inpatient discharge by median 2 days (0–6 d) due to lack of communication within and between Oncology and Nutrition teams. Median duration of HPN was 196 days (1–351 d). Patients were on PN 7 days/wk (4–7 d/wk), with n = 8/10 utilizing nursing input for PN (dis)connection. For those who were nursed this meant 8–14 visits/wk by homecare nurses for PN (dis) connection. HPN was stopped and restarted in 2 patients due to BO resolving and line infection. Reasons for stopping HPN completely included: patients had died (n = 5), were end of life (n = 2) or eating (i.e. BO resolved), suggesting that there was flexibility to stop HPN to patients' circumstances. In addition, decision to stop HPN was not contentious in none of the cases. Post discharge on HPN, median readmissions were 3, of which 0 due to HPN. Follow-up appointments were mostly in oncology than nutrition clinics (5.5 vs 3 follow-ups) whilst on HPN. There was a 3 month longer survival in those on HPN versus not on HP (median survival: 9 months for HPN patients, 4 months in patients not on HPN).

**Conclusions:** HPN is more likely to be set up during the 2<sup>nd</sup> admission for MBO. HPN did not place a substantial burden on the patient with regards to readmissions and follow-up visits to hospital or discharge delays. Nursing visits, in addition to other service visits (e.g. GP, palliative care) could be perceived as burdensome by patients. All these factors should be weighed against survival which was longer in HPN patients. Further research in larger settings and quality of life factors is required.

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## Poster

## Carbohydrate and lipid metabolism

### SUN-PO001

#### COMPARATIVE STUDY BETWEEN CONVENTIONAL FASTING VERSUS OVERNIGHT INFUSION OF LIPID OR CARBOHYDRATE ON INSULIN AND FREE FATTY ACIDS IN OBESE PATIENTS UNDERGOING ELECTIVE ON-PUMP CORONARY ARTERY BYPASS GRAFTING. A PROSPECTIVE RANDOMIZED TRIAL

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**Rationale:** Postoperative insulin resistance represents a major component of postoperative metabolic disorder. The authors compared the effects of preoperative infusion of lipid emulsion or carbohydrate to conventional preoperative fasting on postoperative insulin and free fatty acid (FFA) levels.

**Methods:** Design: A prospective randomized double-blinded study. Settings: Tertiary university hospital. Participants: Sixty-three patients undergoing coronary artery bypass grafting.

**Intervention:** Participants were randomized into 3 equal groups. Group G received 500 mL of glucose 10% (50 g glucose). Group L received 100 mL of 2% lipid emulsion (soybean 30%, medium chain triglycerides (TG) 30%, olive oil 25%, fish oil 15%, and 20 mg vitamin E). Group C fasted overnight except for clear fluids allowed until 4 hours preoperatively. Serum insulin at the start of infusion (T<sub>1</sub>), 1-hour preinduction (T<sub>2</sub>), on admission to the intensive care unit (T<sub>3</sub>), after 24 hours of admission (T<sub>4</sub>), and after 48 hours of admission (T<sub>5</sub>), and FFA at T<sub>1</sub> and T<sub>2</sub> were measured. Serum very-low-density lipoprotein (VLDL), serum TG, and blood sugar were all measured (T<sub>1</sub>-T<sub>4</sub>). Bypass time, ischemic time, need for inotropic support, and length of intensive care unit stay also were measured.

**Results:** Measurements and Main Results: At the end of infusion FFAs were significantly lower in the L group (1.17 ± 0.76 mg/dL) compared with G (1.64 ± 0.85 mg/dL) and C groups (1.48 ± 0.76 mg/dL). Insulin levels were significantly lower in the L group compared with levels in the G and C groups at T<sub>2</sub>, T<sub>3</sub>, and T<sub>4</sub>. Also, TG, VLDL, and random blood sugar levels decreased significantly at T<sub>2</sub>, T<sub>3</sub>, and T<sub>4</sub> in the L group compared with the other 2 groups and compared with baseline value within the same group.

**Conclusions:** Preoperative lipid infusion lowered postoperative FFA, insulin, TG, VLDL, and random blood sugar in obese patients undergoing coronary artery bypass grafting surgeries. © 2017 Elsevier Inc. All rights reserved.

**Disclosure of Interest:** None declared.

### SUN-PO002

#### DYNAMICS OF POLYUNSATURATED FATTY ACID PROFILE IN PLASMA, LIVER AND BLOOD LEUKOCYTES AFTER ENDING PARENTERAL INFUSION OF FISH OIL LIPID EMULSION

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**Rationale:** Aiming to contribute to the design of protocols on specialized nutrition, we evaluated the profile of polyunsaturated fatty acids (PUFA) in different biological samples and periods after the end of a fish oil-containing parenteral lipid emulsion (FOLE) infusion.

**Methods:** After 5-day adaptation in metabolic cages, 78 male Lewis rats (300–450 g) feeding AIN-93M *ad libitum* were sacrificed (BC basal) or had only central venous catheterization (SC Sugery) or also received 72-hour infusion of a commercial lipid emulsion without fish oil (MCT/LCT – EC, LP control) or FOLE (MCT/LCT/FO). After the period corresponding to the end of infusion, these rats were sacrificed at 0 (T<sub>0</sub>), 2 (T<sub>2</sub>), 6 (T<sub>6</sub>) and 12 (T<sub>12</sub>) h. Gas chromatography was used to determine levels of eicosapentaenoic (EPA), docosahexaenoic (DHA) and arachidonic (ARA) acids, and w-3:w-6 ratio in liver, plasma and a pool of peripheral mononuclear and polymorphonuclear leukocytes. Data were compared by Kruskal Wallis and Wilcoxon tests.

**Results:** Leukocytes, plasma and liver from BC group had undetectable EPA and DHA and high ARA levels. Immediately after FOLE infusion (T<sub>0</sub>) these PUFAs changed in all samples, showing a higher w-3:w-6 ratio compared to rats with no FOLE (p < 0.05). These changes remained until T<sub>6</sub> in plasma and T<sub>12</sub> in liver, but were not longer observed in leukocytes after T<sub>2</sub>.

**Conclusions:** Our data suggest that leukocytes clear PUFA early after the end of FOLE infusion. When FOLE is applied for immunomodulatory purposes this should be considered.

**Disclosure of Interest:** None declared.

### SUN-PO003

#### DYNAMICS OF POLYUNSATURATED FATTY ACID UPTAKE IN PLASMA, LIVER AND BLOOD LEUKOCYTES AFTER PARENTERAL INFUSION OF FISH OIL LIPID EMULSION

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**Rationale:** Medium chain triglycerides (MCTs) have been considered useful to promote uptake of n-3 polyunsaturated fatty acids (n-3 PUFAs). We assessed the uptake of n-3 PUFAs in different biological

samples and periods after infusion of a fish oil-containing parenteral lipid emulsion (FOLE) with or without MCT.

**Methods:** After 5-day adaptation in metabolic cages, 42 male Lewis rats ( $\approx 350$  g) fed with AIN-93M were sacrificed (BC, baseline control) or were submitted to central venous catheterization and distributed into: Surgical control group (SC) – no infusion; MCT/LCT/FO group – infusion for 48 and 72 hours of a commercial lipid emulsion (LE) containing 50% MCTs, 40% long chain triglycerides (LCTs) and 10% fish oil (FO) and LCT/FO group – infusion for 48 h and 72 h of an experimental LE containing 80% LCTs and 20% FO. The n-6:n-3 ratio were comparable between both LEs (LCT/FO = 2.7:1; MCT/LCT/FO = 2.3:1). Gas chromatography was used to determine n-3 and n-6 PUFA levels in liver, plasma and blood mononuclear and polymorphonuclear leukocytes. Data were compared by Kruskal Wallis and Wilcoxon tests.

**Results:** There was no difference in the n-3 PUFA uptake, between LEs ( $p > 0.05$ ). In relation to BC and SC groups, leukocyte incorporation of n-3 PUFAs peaked after 48 h infusion and decreased after 72 h in both LE groups. After 48 h infusion, the plasma n-3:n-6 ratio was higher in MCT/LCT/FO group than in the LCT/FO group ( $p < 0.05$ ).

**Conclusions:** Despite promoting an early clearance of plasma n-3 PUFAs, there was no clear benefit of adding MCTs in their uptake in leukocytes and liver.

**Disclosure of Interest:** None declared.

#### SUN-PO004

##### NUTRACEUTICAL INTERVENTION WITH BERBERINE, CHLOROGENIC ACID AND TOCOTRIENOLS FOR MENOPAUSE-ASSOCIATED DYSLIPIDEMIA: A PILOT, SINGLE-ARM TRIAL

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**Rationale:** Dyslipidemia is a frequent feature of menopause, which is associated with increased cardiovascular risk and often requires pharmacological intervention with statins. The aim of this pilot study was to evaluate the potential role of the combination of some compounds of vegetal origin, such as berberine, chlorogenic acid and tocotrienols, in the management of menopause-associated dyslipidemia.

**Methods:** Post-menopause women with menopause-associated dyslipidemia (low-density lipoprotein [LDL] cholesterol  $> 100$  mg/dL) were enrolled in a single-arm pilot trial and received a nutraceutical (Trixy<sup>®</sup>) containing berberine, chlorogenic acid and tocotrienols (1 pill/day) for 3 months. The primary endpoint was the change in measured LDL cholesterol at 3 months. Secondary endpoints included the change in total and HDL cholesterol, triglycerides, blood glucose, insulin, insulin resistance, body weight, waist circumference, body composition by bioimpedance vectorial analysis, Greene Climacteric Scale and quality of life (36-Item Short Form Health Survey).

**Results:** Thirty-one patients were enrolled and 27 (87.1%) completed the study. At 3 months, the intervention was associated with a reduction in LDL ( $-12.3$  mg/dL [95%CI,  $-22.1$  to  $-2.4$ ];  $p = 0.016$ ) and total cholesterol ( $-14.0$  mg/dL [95%CI,  $-22.3$  to  $-5.6$ ];  $p = 0.002$ ) and an improvement in Greene Climacteric Scale ( $-8.7$  points [95%CI,  $-12.9$  to  $-4.6$ ];  $p < 0.001$ ). No significant changes in the other endpoints were observed and no complications occurred.

**Conclusions:** The combination of berberine, chlorogenic acid and tocotrienols could be a useful adjuvant therapy for menopause-associated hypercholesterolemia and climacteric symptoms. Further randomized-controlled trials with adequate samples and observation periods are needed to confirm this hypothesis.

**Disclosure of Interest:** None declared.

#### SUN-PO005

##### SOLEUS MUSCLE CONTAINS HIGHER LIPID MEDIATORS THAN EXTENSOR DIGITORUM LONGUS: SLOW/FAST FIBER-SPECIFIC ANALYSIS IN ENDOTOXEMIA USING LC-MS/MS

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**Rationale:** We have reported that lipopolysaccharide (LPS) injection induced skeletal muscle atrophy on early phase (ESPEN 2015); however, detailed analysis of fatty acid-derived lipid mediators in skeletal muscle has not been reported yet. The purpose of this study was to evaluate fiber-specific analysis of muscular lipid mediators using liquid chromatography/tandem mass spectrometry (LC-MS/MS) in endotoxemic rats.

**Methods:** Male Wistar rats were treated with 10 mg/kg LPS i.p. injection. Soleus (slow) muscles and extensor digitorum longus (EDL, fast muscle) were harvested at 0, 6, and 24 h after LPS injection. Lipid mediators were profiled using LC-MS/MS, and free fatty acids (FFA) composition of phospholipid fractions was analyzed by gas chromatography-mass spectrometry (GC-MS).

**Results:** Before LPS injection, all FFA, including arachidonic acid, eicosapentaenoic acid, and docosahexaenoic acid (DHA), and all lipid mediators measured were higher in soleus muscles than in EDL, especially pro-inflammatory prostaglandin (PG) E<sub>2</sub> and anti-inflammatory resolvin (Rv) E3 ( $p < 0.01-0.05$ ). The anti-inflammatory lipid mediators from DHA, RvD5 and protectin D1, were only detected in soleus muscles. Because FFAs are the main source of energy in soleus muscles, their metabolites lipid mediator might be higher than EDL. LPS injection changed lipid mediators, PGE<sub>2</sub> were increased at 6 h after LPS injection in both muscles ( $p < 0.01$ ). The increased PGE<sub>2</sub> may affect muscle atrophy.

**Conclusions:** Free fatty acids and lipid mediators were higher in soleus muscle and LPS increased pro-inflammatory lipid mediators at very early phase.

**Disclosure of Interest:** None declared.

#### SUN-PO007

##### EVALUATING LONG-TERM USE OF SOYBEAN OIL, MEDIUM-CHAIN TRIGLYCERIDE, OLIVE OIL AND FISH OIL (SMOFLIPID<sup>®</sup>) IN ADULTS WITH INTESTINAL FAILURE

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**Rationale:** To determine whether SMOFlipid® is associated with more effective or less favourable outcomes compared to alternative lipids in patients needing home parenteral nutrition (HPN).

**Methods:** A single-centre, retrospective cohort study was completed on those receiving HPN between 1<sup>st</sup> April 2011 to 31st March 2015. Individuals were stratified into two groups based on lipid received over 12 consecutive months. SMOFlipid® (SL) was compared with soybean oil, or olive oil combined with soybean oil (SO). Outcomes included liver dysfunction, tolerability and clinical signs of essential fatty acid deficiency. Statistical analysis was completed on SPSS (IBM version 23).

**Results:** 179 patients (mean age 55 years, 58.1% female) were included. There were no differences in gender, age, diagnosis, type of Intestinal Failure, chronic cholestasis or liver function in SL (n=37) and SO (n=62). At 12 months, groups did not differ in chronic cholestasis prevalence (SL n=5 (17.9%), SO n=13 (25.0%) p=0.466) or incidence (SL n=5 (17.9%), SO n=12 (23.1%) p>0.999), mean liver function (ALP SL 165.06 (SD 98.14), SO 165.26 (SD 81.27) p=0.912; GGT SL 121.59 (SD 146.21), SO 123.85 (SD 142.12) p=0.953; bilirubin SL 9.00 (SD 6.38), SO 9.24 (SD 11.06) p=0.916; ALT SL 47.70 (SD 37.76), SO 36.29 (SD 22.62) p=0.141); mean change in liver function (ALP SL –20.84 (SD 85.92), SO 4.93 (SD 112.25) p=0.273); GGT SL 9.50 (SD 14.85), SO –14.00 (SD 31.22) p=0.373; SL bilirubin –1.81 (SD 7.36), SO 1.18 (SD 12.76) p=0.280; SL ALT –15.67 (SD 52.96), SO –3.88 (SD 30.42) p=0.273); catheter sepsis (SL n=4 (10.8%), SO n=2 (3.3%) p=0.195) and change in body mass index (SL 1.72 (SD 2.75), SO 1.69 (SD 3.17) p=0.971). There was no group difference in chronic cholestasis or liver dysfunction after adjusting for confounding variables. Essential fatty acid deficiency was not observed in either group.

**Conclusions:** Noclinically relevant differences were noted between the SMOFlipid® and comparator in the outcomes analysed. Additional studies are required to investigate the optimal lipid formulae to manage liver dysfunction while avoiding essential fatty acid deficiency.

**Disclosure of Interest:** T. Khatib Grant/Research Support from: MPhil research sponsored by Fresenius Kabi, S. Burden: None declared, S. Lal: None declared, S. Tyson: None declared.

#### SUN-PO008

##### EFFECT OF RESVERATROL, CAPSAICINE AND PIPERIN ON LIPID METABOLISM IN 3T3L1 CELLS

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**Rationale:** Several food ingredients have been suggested to have preferable effects on lipid metabolism and obesity, evidences are rarely available and their mechanisms are not well known. In order to confirm the effects and to elucidate the mechanisms, resveratrol, capsaicin and piperin were analyzed for effects on the lipid accumulation and gene expression relevant to lipid metabolism using adipocytes.

**Methods:** Preadipocytes 3T3-L1 were cultured in Dulbecco's Modified Eagle Medium including 10% Fetal Calf Serum under 5% CO<sub>2</sub>. At the second day after confluence, cells were differentiated by adding isobutyl methyl xanthin, dexamethazon and insulin to the medium. Food ingredients were added to the adipocytes with or without epinephrin. At the 7th day, the cells were quantified lipid content by enzymatic method and Oil Red O staining. Total RNA was prepared from the cells and gene expressions of relevant genes to lipid metabolism were analysed using real-time PCR.

**Results:** Compared to control, triglyceride content accumulated in cells was significantly decreased up to 54.3% by the addition of capsaicin and up to 21.3% by resveratrol dose-dependently. Capsaicin when added with epinephrin enhanced the suppressive effect of epinephrin 143%. Secretion of leptin into the media was decreased to 24.9% by resveratrol and increased to 171% by capsaicin. Adiponectin was increased to 110% by resveratrol. Gene expression of PPAR-gamma was increased to 340% by resveratrol and to 633% by capsaicin. That of insulin receptor was increased 15.5 times and adrenergic beta-3 receptor gene was increased 8.7 times by capsaicin. Piperin itself did not have consistent effect on lipid accumulation, but it enhanced 2.1 fold the effect of epinephrin which decreased the lipid content of cells to 60.7%. Piperin increased the gene expression of adrenergic beta-3 receptor to 354%, perilipin to 173% and hormone-sensitive lipase to 185%.

**Conclusions:** It is suggested that resveratrol decreases triglyceride content of adipocytes by cell differentiation through gene expression of PPAR-gamma. Capsaicin is suggested to enhance the lipid degradation by increasing the sensitivity to epinephrin. Piperin enhanced the degradation of the triglyceride by epinephrin through multiple mechanisms relevant to the triglyceride degradation. These food ingredients may be beneficial to obesity and metabolic syndrome.

**Disclosure of Interest:** None declared.

#### SUN-PO009

##### D-GLUCOSAMINE ACTS AS A CALORIE RESTRICTION MIMETIC AND EXTENDS NEMATODE LIFESPAN VIA AUTOPHAGY INDUCTION

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**Rationale:** D-Glucosamine (GlcN) has been used for promoting joint health; however, recently, it was reported that its efficiency is limited. In an epidemiologic study, mortality significantly reduced in people who consistently took GlcN [1]. Screening various monosaccharides in mammalian cells revealed that GlcN induced autophagy and might influence lifespan [2]. In this study, we examined autophagy induction and lifespan extension in *C. elegans* by GlcN [3].

**Methods:** Autophagy induction in transgenic nematodes upon administering GlcN and expression of GFP-fused LGG-1, a marker of autophagy, was analyzed by western blotting. Dots in cells, representing autophagosome were measured by microscopy. Using 100 primary larvae, lifespan extension of nematodes was measured when treated with or without GlcN. Survival curves were obtained and analyzed by log-rank test. To identify the lifespan extension mechanism, wild-type strain N2 and three lifespan signal mutant strains, *daf-16* (insulin signal-related gene), *sir-2.1* (sirtuin gene), and *atg-16* (autophagy related gene), were examined.

**Results:** Autophagy induction by GlcN was demonstrated by western blotting for LGG-1 and by detecting autophagosomal dots in seam cells by fluorescence microscopy. Administration of GlcN induced autophagy in nematodes and prolonged lifespan by 20%. It increased the lifespan of *daf-16* and *sir-2.1* mutants, but not of *atg-16* mutant.

**Conclusions:** We conclude that the lifespan extension is autophagy dependent [3]. GlcN was recently reported as a calorie restriction mimetic with autophagy-inducing activity [4]. Although this study had some experimental limitations, the autophagy-inducing activity of GlcN could partly explain its role in epidemiological research.



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**Disclosure of Interest:** None declared.

## Critical care 1

### SUN-PO011

#### NUTRITIONAL SUPPORT IN SEPSIS

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**Rationale:** To date, the debate continues regarding the substrate maintenance of patients with sepsis.

The purpose of the study is to study the severity of metabolic dysfunction and determine the parameters of the optimal substrate maintenance of patients with sepsis.

**Methods:** The study included 166 patients with sepsis (106 men, 60 women, average age – 52.8 ± 17.0 years). According to the source of sepsis: abdominal – 51.2%, pulmonary – 30.8%, soft tissue infection – 9%, neurosepsis – 9%. In 77.7% of patients, BMI corresponded to eutrophy, 15.1% – hypotrophy, 7.2% – to obesity. The severity of organ dysfunction on the SOFA scale during diagnosis was 4.44 ± 2.4 points, consciousness on the Glasgow scale – 11.7 ± 3.1 points. The average duration of stay in the ICU is 25.4 ± 11 days, the average duration of MV – 17.5 ± 16.1 days. The overall mortality rate is 39.2%.

Resting metabolic rate (RMR) was determined by the method of indirect calorimetry (IC), the severity of the catabolic reaction by determining the daily loss of nitrogen.

**Results:** The average RMR in sepsis according to IC for the entire observation period was 30.1 ± 1.1 kcal/kg/day. The average RMR in the initial period of sepsis was 27.1 ± 1.5 kcal/kg/day, reaching a peak by 5 days of illness (33.1 ± 1.7 kcal/kg/day) and, further, stabilized at the level of 30.0 ± 2.2 kcal/kg/day.

The average daily loss of nitrogen over the entire observation period was 18.8 ± 0.6 g/day (0.27 ± 0.01 g/kg/day), which corresponded to 1.68 ± 0.06 g/kg/day of protein. Protein losses reached a maximum by the 5 days of illness (1.93 ± 0.12 g/kg/day) and subsequently amounted to 1.56 ± 0.13 g/kg/day.

The ratio of lost nitrogen to RMR according to IC depends on the severity of the catabolic reaction. With nitrogen losses of less than 20 g/day, this ratio was 1:120, from 20 to 30 g/day – 1:95, more than 30 g/day – 1:68.

**Conclusions:** The amount of nutritional support for patients with sepsis should be adjusted to the severity of systemic metabolic dysfunction.

**Disclosure of Interest:** None declared.

### SUN-PO012

#### NUTRITIONAL SUPPORT WITH IMMUNE-ENHANCING FORMULA IN THE PATIENTS WITH CLOSED HEAD INJURY

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**Rationale:** Early enteral nutrition is the most widespread way of nutrients delivery in the patients with closed head injury. The aim of this study is to assess immunological benefits of early enteral immunomodulating nutrition in the patients closed head injury.

**Methods:** 64 consecutive patients with closed head injury (after decompressive craniotomy) were randomly divided into 2 groups. In the 1st group (n = 32) standard enteral formula was used (from 0.5 kcal/ml on 1th day to 1–1.5 kcal/ml on 7th day). In the 2nd group (n = 32): 1st day – using supplementary nutrition (enteral glutamine 30 g/day), from 2nd to 7th days- enteral immune-enhancing formula (1 kcal/ml, with gradual increasing in a volume fraction). Nutrition was guided by indirect calorimetry. Data are shown as mean ± SD. Parameters were analysed by SPSS.

**Results:** Dynamics of cell-mediated immunity indices in both groups has shown that all patients had propensity to an immune deficiency. 1st day after operation 1st/2nd groups (respectively): CD3 lymph (%): 58.7 ± 3.4/58.1 ± 3.7; CD4 lymph (%): 38.8 ± 1.5/37.4 ± 2.8; CD8 lymph (%): 29.6 ± 1.3/30.4 ± 2.1; CD4/CD8: 1.31 ± 0.02/1.26 ± 0.05 (p < 0.05; Wilcoxon's ranksum test). The peripheral Tcell fraction on peripheral lymphocytes, CD3, CD4, CD8 in 1st group were significantly lower than those in 2nd group. On 7th day 1st/2nd groups (respectively): CD3 lymph (%): 54.4 ± 3.5/59.5 ± 2.8; CD4 lymph (%): 25.4 ± 3.3/34.7 ± 3.4; CD8 lymph (%): 29.0 ± 2.1/22.3 ± 2.7; CD4/CD8: 0.87 ± 0.05/1.55 ± 0.06 (p < 0.05; Wilcoxon's ranksum test). Antibody deficiency was detected in both groups (no significant difference during follow-up period).

**Conclusions:** Enteral nutritional support with an immune-enhancing formula has potential immunological benefits on cell-mediated immunity indices predominantly.

**Disclosure of Interest:** None declared.

### SUN-PO013

#### REFEEDING SYNDROME IN A CRITICAL CARE UNIT

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**Rationale:** Refeeding syndrome (RS) is a likely fatal condition in critical ill patients, characterized by metabolic and clinical complications. This syndrome is associated with hypophosphatemia and changes in blood electrolytes such hypomagnesemia and hypocalcemia. We conducted a study to analysed the prevalence of RS in the unit of Portimão in the intensive care of Teaching Algarve Hospital.

**Methods:** We conducted a observational retrospective study in all the patients that have full artificial nutrition for a period more than 4 days. We collected data between 1st Abril 2016 since 31 March 2018. We collected biochemical parameters such phosphorus, calcium, magnesium, albumin, C- reactive protein, total proteins. We also analyse nutritional intake value (initial and final with and without additives), initial and final protein intake and the Simplified Acute Physiology Score (SAPS II). Data were analysed using SPSS statistical program version 22. Mann-Whitney, Kruskal-wallis and Wilcoxon tests were used, statistical significance accepted at p < 0,05.

**Results:** Our study assessed 93 patients under artificial nutrition, 26% of patients (n = 24) had hypophosphatemia and 67% of those (n = 16) had hypocalcemia. None of the patients had hypomagnesemia. Patients with hypophosphatemia had a mean age of 67.3 years (sd = 14.5), mean of BMI of 25.5 Kg/m<sup>2</sup> (sd = 3.5), and mean length of hospital stay of 12.5 days (sd = 8.8). Their mean initial caloric intake with additives was 1425.4 kcal (sd = 1114.6), significantly higher (p = 0.01) than the one in patients without hypophosphatemia (mean = 1341.1 kcal, sd = 722.1). The SAPSII for the patients with hypophosphatemia was 44 (sd = 18.3) and the patients without hypophosphatemia 52 (sd = 17.3).

Patients with hypophosphatemia had a 40% mortality rate during their UCI stay and a mortality rate of 40% 28 days after admission. The mortality rates for the patients without hypophosphatemia were 18,3% and 36,6%. The mortality rate during ICU stay of patients with hypophosphatemia was significantly higher ( $p=0.04$ ).

**Conclusions:** In our study we found a prevalence of 26% of hypophosphatemia in the ICU patients. From this 26%, 67% had hypocalcemia. The mortality of patients with hypophosphatemia was significantly higher. These results prompted a clinical meeting with the purpose of providing training to the ICU team and protocols of enteral and parenteral nutrition were reviewed.

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**Disclosure of Interest:** None declared.

#### SUN-PO014

##### INTEREST OF BODY COMPOSITION ANALYSIS IN CT IN CIRRHOTIC PATIENTS WITH SEPTIC SHOCK

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**Rationale:** Body composition is known to be a prognostic factor in cirrhotic patients. However, the link between this and the prognosis of patients in intensive care unit (ICU) is unknown. The Computed tomography offer accurate estimations of muscle mass by analysing a cross-section usually going through the third lumbar vertebrae.

This retrospective study aimed to assess the feasibility of body composition (BC) analysis in cirrhotic patients with septic shock, using Computed Tomography (CT) and evaluate the impact of BC (muscle mass, subcutaneous and visceral fat) on outcome.

**Methods:** This retrospective study included 36 cirrhotic patients with septic shock hospitalized in ICU who underwent an abdomino pelvic CT scan within 48 hours of admission. We collected the surface areas of muscle mass and adipose tissue on the CT scans. We compared BC data with mortality and with the number of organ failures.

**Results:** The average age was 60 years (42–73). The average Child and MELD scores were respectively 10,8 (8–14) and 28,7 (15–54). The prevalence of sarcopenia was 50%. It was not associated with a higher mortality rate at day 28 ( $p=0.31$ ) or with a higher number of organ failures at day 28 ( $p=0.55$ ). We observed a higher subcutaneous adiposity index in patients who died at day 28 ( $p=0.03$ ) and in patients with renal insufficiency at admission ( $p=0.019$ ). There was a trend ( $p=0.057$ ) towards more visceral fat in patients who died in ICU.

**Conclusions:** The assessment by CT of body composition reveal Evaluation of BC using CT is feasible and reproducible and may constitute a promising tool to evaluate in cirrhosis critically ill patients. Visceral fat mass seem associated with poor outcome in cirrhotic patients with septic shock.

**Disclosure of Interest:** None declared.

#### SUN-PO015

##### RETROSPECTIVE EVALUATION OF TREATMENT OF GLUTAMINE RICH ENTERAL NUTRITION IN THE INTENSIVE CARE UNIT

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**Rationale:** Glutamine plays an important role to maintenance of renal acid base balance, regulation of immune system cells and proinflammatory cytokines, protein and nucleotide synthesis, glutathione synthesis and heat shock protein production. The aim of this study was to evaluate the effects of glutamine-rich enteral nutrition support therapy on morbidity in the intensive care unit.

**Methods:** After the approval of the ethics committee, 40 patients between the ages of 18–92 were enrolled in the first 24–48 hours of enteral nutrition. The patients were randomized into two groups as standart isocaloric glutamine-free enteral nutrition and glutamine-supplemented enteral formula groups. In Glutamine group 0.3 g/kg/day enteral L-glutamine was given within 24 hours. The standart enteral formula was also administered during 24 hours. APACHE II and SOFA scores of the patients in the first 24 hours, 7, 14, 21 and 28 days, mechanical ventilator durations and culture results were compared. Plasma samples and urine laboratory parameters were collected at the 24th hour and after 7, 14, 21 and 28 days. Demographics of patients, types of nutritional therapy and complications were recorded.

**Results:** The demographic data and hospitalization diagnoses of the patients were similar. When the first 24 hours and 7, 14, 21, 28. APACHE II and SOFA scores, blood and urine laboratory results were evaluated, there was no difference between the two groups and the time of measurement. Plasma ammonia and urea levels were similar. The duration of mechanical ventilation was similar between two groups.

**Conclusions:** As a result, When the factors affecting the morbidity were examined, Although lower rates of blood and urinary infection rates were observed in patients receiving glutamine-containing enteral nutrition compared to patients undergoing standard isocaloric enteral nutrition, there were no no statistical significant differences were found.

**Disclosure of Interest:** None declared.

#### SUN-PO016

##### VITAMIN D IN CRITICALLY ILL PATIENTS WITH PARENTERAL NUTRITION: A COHORT STUDY

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**Rationale:** Low serum levels of vitamin D have been found in observational studies conducted on patients in the intensive care unit (ICU). This deficiency may be associated with comorbidities and poor prognosis. The purpose of this study was to evaluate if vitamin D deficiency is associated with poor prognosis measured as longer ICU and hospital stay.

**Methods:** We conducted a retrospective study with critically ill patients with parenteral nutrition (PN) between January 2017 and March 2019. Vitamin D blood levels were retrospectively gathered

from the patients charts of all critically ill patients receiving PN; as well as demographics, ICU and hospital stay, and laboratory data. Linear regression models were performed with ICU stay and hospital length of stay (days) as dependent variables, and vitamin D blood levels and APACHE II score as independent modifiers variables.

**Results:** A total of 64 vitamin D blood values from 50 critically ill patients with PN were included. Mean vitamin D level was  $12.1 \pm 6.6$  ng/mL. Sixty percent of the patients assessed showed severe deficiency (vitamin D < 12 ng/mL). A total of 43 samples were obtained prior to PN start, and 21 during a mean of  $6.5 \pm 33.6$  days of PN therapy. No differences were found in mean vitamin D obtained prior or during the PN ( $11.5 \pm 5.2$  vs  $13.2 \pm 8.8$  ng/mL respectively); nor in percentage of samples with severe deficiency 60.5 vs 61.9% respectively. In this retrospective cohort, vitamin D level during or prior the PN therapy was not significantly associated with length of stay in ICU, nor in hospital. Overall mortality was 16% (8 of 50 patients), being slightly associated with severe deficiency (23.3% [7 patients] in severe deficiency patients vs 5% [1 patient] non severe deficiency;  $p = 0.12$ ). Only 6 patients (16.7%) showed normal serum values of vitamin D ( $\geq 20$  ng/mL), none of these patients died during the hospital stay.

**Conclusions:** Vitamin D deficiency was not associated with persistent critical illness leading to longer hospital or ICU stay. However patients with severe deficiency showed higher rates of mortality. Standard supplementation with multivitamins products in PN were insufficient to reach normal values of vitamin D level. Supplementation with vitamin D should be performed to achieve normal values in severe deficiency.

**Disclosure of Interest:** None declared.

#### SUN-PO017

##### RELATIONSHIP BETWEEN CALORIC-PROTEIN ADEQUACY AND NUTRITIONAL RISK BY NUTRIC SCORE

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**Rationale:** Daily monitoring of nutritional therapy adequacy is essential in the evaluation of the quality of care. The aim this study is to evaluate the relationship between the caloric-protein adequacy in ICU patients and Nutritional Risk (RN) by Nutric Score (RS)

**Methods:** Retrospective cohort in an ICU of a private hospital ( $n = 79$ ), adults, under enteral and parenteral nutrition, for at least 6 days, being included from the 4th to the 9th day to calculate the caloric-protein adequacy until 30 days. The data were represented by medians and percentiles and the Mann-Whitney test was applied. Categorical data (%) were analyzed by the X<sup>2</sup> test, or Fisher's Exact. The accuracy was analyzed by the ROC curve. A logistic regression was performed, and  $\alpha \leq 0.05$ .

**Results:** 92.9% of patients in the High Nutritional Risk Group (HNRG) reached the Caloric Goal (CG) at the first week of hospitalization compared to 66.7% of the patients in the Low Nutritional Risk Group (LNRG);  $p = 0.003$ . 73.2% of HMRG reached >80% in the first week vs 4.2% of LNRG;  $p < 0.001$ . Among those who achieved CG in both groups, the median NS was 6.0 vs 5.0;  $p = 0.016$ , APACHE II median was 19 vs 13.5;  $p = 0.054$ ; SAPS3 median of 54.5 vs 47;  $p = 0.018$ . 95.3% of the HLRG reached the Protein Target (PT) vs 73% of the LNRG;  $p = 0.005$ . The median APACHE II was 21 in vs 16 LNRG,  $p = 0.0017$ , SAPS3 median of 56 vs 4;  $p = 0.042$  and median NS of 6.0 vs 5.0  $p = 0.073$ . The median frailty score was 7 for HNRG vs 5 for LNRG,  $p = 0.003$ . SAPS3 had low prognostic accuracy for PT, ROC curve  $0.67 \pm 0.07$   $p = 0.017$ . APACHE II and SOFA did not present good accuracy and are predictive factors for NS with odds ratio of 2.7 (1,1–6,6)  $p = 0.026$

**Conclusions:** NS presented better performance when associated with other scores. The fact that the goals were more easily reached in the

most severe group suggests that the nutritional risk assessment arouses greater attention from the multiprofessional team.

**Disclosure of Interest:** None declared.

#### SUN-PO018

##### MULTIPROFESSIONAL TEAM ENGAGEMENT TO REDUCE PREVALENCE OF PRESSURE INJURY IN A CARDIOLOGICAL ICU

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**Rationale:** During the analysis of prevalence of Pressure Injury (PI) an opportunity for improvements was identified in the Cardiology Intensive Care Unit (ICU), which presented a median prevalence of 50% in the six months prior to the start of the project.

**Methods:** A descriptive study conducted in a highly complex Cardiology ICU o from March to September 2018, using the science of improvement. The project team together with the ICU have set a series of interventions focused on the prevalence reduction, building a directing diagram with four pillars of change: best practice-based assistance, standardization of prevention actions through the development of a care bundle, multi professional team engagement, and both patient and family involvement in the process.

**Results:** The bundle of prevention elaborated includes: evaluation and skin care, choice of support surface, early and effective movement, moisture management and nutrition/hydration. Regarding the nutritionist's performance, a retrospective survey was performed on the nutritional support of the patients, according to the nutritional demands. So it was possible to observe that most of patients were not reaching nutritional goals, especially due to hemodynamic instability and the severity of the clinical case. Based on that, among the project actions the issue of pressure injury is included in the daily multi professional visitation, discussing the patient's nutritional status, early start of the diet, and the establishment of nutritional goals to ensure that a prescribed diet is being correctly followed. The realization of the project and the implementation of all interventions from the bundle contribute to a reduction of 80% on the prevalence of PI in the cardiology ICU (from 50% to 10%).

**Conclusions:** The project has shown the importance of engagement as part of a multi professional team, and how well structured interventions can contribute to the quality of service, reducing the occurrence of PI.

**Disclosure of Interest:** None declared.

#### SUN-PO019

##### WHICH HAS MORE IMPACT ON MORBIDITY AND MORTALITY IN INTENSIVE CARE PATIENTS; PROTEINS OR CALORIES?

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**Rationale:** Optimal energy and protein values in the catabolic process that begins with the admission of patients to the intensive care unit has been studied for many years (1). The aim was to compare different levels of protein and calorie intake in terms of morbidity and mortality in intensive care patients given nutritional support.

**Methods:** This study has been designed as a retrospective study in the Intensive Care Unit of Karadeniz Technical University, and 321 patients who were followed up and received enteral nutrition in the Intensive



Care Unit between January 1, 2008 – March 1, 2019 were examined for 14 days commencing from the initial date of hospitalization. The patients were divided into two main groups based on protein intake ( $\leq 1.2$  g/kg/day,  $n = 142$ ;  $> 1.2$  g/kg/day,  $n = 179$ ) and the groups were divided into sub-groups based on calorie intake ( $\leq 25$  kcal/kg/day and  $> 25$  kcal/kg/day [ $n = 107$  and  $n = 35$  in the high protein group;  $n = 73$  and  $n = 106$  in the low protein group, respectively]). The patients' demographics and morbidity and mortality factors were compared.

**Results:** When the demographics, biochemical parameters, septic shock development, presence of decubitus ulcer, PaO<sub>2</sub>/FiO<sub>2</sub> ratios, the types of enteral products used, vasopressor drug use, and the rates of rehospitalization in the intensive care unit were compared between the patients included in the study, no significant difference was seen between the groups ( $p > 0.05$ ). Nosocomial infection (NCI), mechanical ventilation, and length of stay in the intensive care unit (ICU) of the patients who had a low protein diet were found to be longer compared to those who had a high protein diet, without any difference in calorie intake ( $p < 0.05$ ). When the patients who had a high protein intake were evaluated, NCI, ICU mortality and reintubation rates were detected to be lower in the patients with a hypocaloric diet compared with those with a normocaloric diet ( $p: 0.001, 0.039, \text{ and } 0.012$ , respectively). The seventh day APACHE II (Acute Physiology Assessment and Chronic Health Evaluation) score of the patients with a hypocaloric high protein diet was found to be significantly lower than that of the other three groups ( $p < 0.05$ ). The seventh and 14th day SOFA (The Sequential Organ Failure Assessment) scores of the patients with high protein intake were detected to be significantly lower regardless of calorie intake ( $p < 0.05$ ).

**Conclusions:** It was concluded that high protein intake was associated with better clinical outcomes and that clinical condition markers were better particularly in the case of a hypocaloric high protein diet.

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**Disclosure of Interest:** None declared.

#### SUN-PO020

##### HYPERGLYCEMIA ASSOCIATED WITH NUTRITIONAL RISK PREDICTS MORTALITY AND LONGER INTENSIVE UNIT CARE STAY IN CRITICALLY ILL PATIENTS: A MULTICENTER LONGITUDINAL STUDY

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**Rationale:** The nutritional risk in critically ill patients is considered a predictor of mortality, as well as the presence of hyperglycemia. Probably, critically ill patients with nutritional risk and with hyperglycemia have a worse prognosis. So, the aim of this study was to evaluate the frequency of death and length of stay at the intensive care unit (ICU) in critically ill patients grouped according to the presence of nutritional risk and hyperglycemia.

**Methods:** A longitudinal study was performed in two ICUs of two Brazilian states with critically ill adult patients, whose nutritional risk (NR) was assessed from the modified NUTRIC score in the first 24 hours after admission to the ICU. From the fasting blood glucose values, the patients were grouped for the presence of hyperglycemia (fasting glycemia  $> 180$  mg/dL). The RN and the presence of hyperglycemia were grouped and the patients were divided into four categories: 0. without hyperglycemia and without NR; 1. without hyperglycemia

and with NR; 2. with hyperglycemia and without NR and 3. with hyperglycemia and with NR. Outcomes of interest were mortality at 28 days and length of ICU stay (categorized from the median). The ethical committee of the two hospital approved the protocol.

**Results:** A total of 320 patients ( $62.0 \pm 17.4$  years, 54.4% males, 63.4% in ventilatory support) were evaluated. RN was identified in 49.2% of the studied sample and hyperglycemia in 26.6% of the patients. More than half of the patients remained in the ICU for more than eight days (54.6%) and 34.5% died in 28 days. Patients with hyperglycemia had a higher frequency of death compared to patients without hyperglycemia (44.9% versus 32.1%,  $p = 0.043$ ), while the frequency of ICU stay  $> 8$  days did not differ between groups (62.8% versus 55.7%,  $p = 0.287$ ). Patients with NR had a higher frequency of death and hospitalization in the prolonged ICU when compared to patients without NR ( $p < 0.001$  for both analysis). When considered the variable 'hyperglycemia associated with NR', the frequency of death was significantly higher in patients with hyperglycemia and NR (0. 25.5%, 1. 42.4%, 2. 19.0%, 3. 60.8%,  $p < 0.001$ ), as well as the frequency of patients with stay at ICU  $> 8$  days: 0. 49.1%; 1. 69.6%; 2. 57.1%; 3. 68.6% ( $p = 0.014$ ).

**Conclusions:** The assessment of hyperglycemia combined with nutritional risk screening appears to be a good predictor of clinical outcomes in critically ill adult patients.

**Disclosure of Interest:** None declared.

#### SUN-PO021

##### THE ROLE OF OBESITY IN THE OCCURRENCE OF INFECTIONS DURING INSERTION AND CARE OF CENTRAL VENOUS CATHETERS. A PROSPECTIVE OBSERVATIONAL STUDY IN GREECE

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**Rationale:** CLABSIs are infections that are associated with the insertion and the care of central venous catheters (CVCs). The aim of this study was to investigate the incidence and the role of the obesity in the development of CLABSIs.

**Methods:** This is a prospective observational study, which took place in three ICUs in Greece. We excluded all patients who died within 48 hours of their admission to ICU ( $n = 106$ ), patients who for any reason could not measure an obesity assessment parameter ( $n = 8$ ), and patients who had not been classified by a severity-of-disease classification system ( $n = 5$ ). One-way Anova analysis and non-parametric tests were used for the statistical analysis of the data.

**Results:** The study sample consisted of 372 patients aged  $63.6 \pm 16.6$  years with APACHE II  $23.3 \pm 6.9$  and MODS  $7.5 \pm 3.8$ . A total of 174 (46.8%) patients were normal weight, 128 (34.4%) overweight, 36 (9.7%) obese, 26 (7%) underweight and 8 (2.2%) severe obese. Totally, 5426 catheter days were studied. The incidence of CLABSI was 2,248% or 22,48 cases per 1000 catheterization days. Patients with CLABSI were significantly more overweight (59% vs. 35.3%,  $p < 0.05$ ) and obese (19.7% vs. 13.7%,  $p < 0.05$ ) than non CLABSI. Obese and severe obese patients compared to normal weight had significantly longer duration of catheterization ( $p < 0.05$ ) and more catheterization days ( $p < 0.05$ ), developed CLABSI earlier ( $p < 0.05$ ), had significantly longer hospitalization in ICU ( $p < 0.05$ ), and lower percentage of survival ( $p < 0.05$ ). Also, doctors attempted significantly more times to insert CVC in obese and severe obese patients ( $p < 0.05$ ). BMI was found to be a prognostic factor for CLABSI ( $\beta = 0.201$ , OR = 1.223, 95% CI: 1.107–1.351).

**Conclusions:** Obese patients are more likely to be catheterized in the femoral vein and doctors were unable to easily place the CVC.

**Disclosure of Interest:** None declared.

#### SUN-PO022

##### THE IMPORTANCE OF BODY MASS INDEX IN THE OUTCOME OF PATIENTS WITH OUT-OF-HOSPITAL CARDIAC ARREST

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**Rationale:** Obesity has been demonstrated to increase the risk of out-of-hospital cardiac arrest (OHCA) and may influence the quality and effectiveness of cardiopulmonary resuscitation. The aim of the study was to investigate the association between body mass index (BMI) and the outcome of OHCA victims.

**Methods:** This was a prospective observational study. The patients were categorized according to BMI into four groups: the normal BMI group, the overweight group, the obese group and the severe obese group. We included all patients who were transferred to the emergency department of a large hospital in Greece after OHCA. One-way Anova analysis and non-parametric tests were used for the statistical analysis of the data.

**Results:** The study sample consisted of 84 patients aged  $59.3 \pm 12.4$  years. The patient's BMI was  $29.8 \text{ kg/m}^2$ . Totally, 16 (19.3%) patients had normal weight, 30 (36.1%) patients were overweight, and 38 (44.6%) patients were obese and severe obese. The transfer time for patients from the site to ED was  $9.7 \pm 7.5$  min. Severe obese patients had significantly longer transfer time than normal weight ( $22.8 \pm 21.3$  min versus  $7.8 \pm 4.1$  min,  $p < 0.05$ ), and overweight patients ( $22.8 \pm 21.3$  min vs.  $8.9 \pm 3.5$  min,  $p < 0.05$ ). Thirteen (15.5%) patients achieved ROSC and were admitted to the ICU. Survival to ICU admission and ICU discharge were higher in the obese and severe obese patient's group than normal weight (17.6% vs. 6.25%,  $p < 0.05$  and 10.3% vs. 6.25%,  $p < 0.05$ , respectively) and overweight patients (17.6% vs. 9.11%,  $p < 0.05$  and 10.3% vs. 7.41%,  $p < 0.05$ , respectively).

**Conclusions:** Obese and severe obese patients had higher survival to ICU admission rates and ICU discharge rates than normal weight and overweight patients. Obesity had a protective role in patients with cardiac arrest.

**Disclosure of Interest:** None declared.

#### SUN-PO023

##### LONG-STAYER PATIENTS IN THE ICU: WERE THEY SPECIAL FROM START?

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**Rationale:** The intensive care (ICU) patient population has changed during the last 2 decades, with an increasing number of very long ICU stays, lasting up to several months. Long-stayers are usually defined as requiring more than 1 weeks of mechanical ventilation (MV) and of ICU therapy. Nothing is known about their nutritional characteristics. In an attempt to better coordinate their treatment and reduce their length of stay (LICU), the service instituted a dedicated program enrolling patients requiring more than 2 weeks of ICU treatment. The

study aimed at investigating the demographic, nutritional and metabolic aspects of their stay.

**Methods:** Retrospective analysis of 150 consecutive patients admitted to the long-stayer program of the multidisciplinary ICU. Data extracted from the computerized system: age, weight, NRS score, severity of disease, admission for sepsis, requirement of renal replacement therapy (RRT), daily energy, protein, glucose, insulin, discharge MRC score, length of MV and ICU stay, outcome. Separate analysis of the first days (D1–D5 and D1–D7), and rest of ICU stay (D8–D30). Data as median [IQR 25/75], and standard deviation for glucose.

**Results:** Cohort characteristics were: age 62 years [52/71], NRS 5 [3/7], SAPSII score 51 [39/66]; 73 (51%) patients were admitted for septic conditions; 74 (48.7%) required RRT. LICU was 28 days [22/42] with mortality 18.7%; NRS was significantly higher in those dying ( $p = 0.007$ ). The nutrition intakes were extremely variable during the first week with variable delay of initiation and multiple interruptions, stabilizing thereafter at values inferior to the protocol recommendation. Median protein intakes and energy balances from D1–D7 were  $0.92 \text{ g/kg}$  [0.79–1.15] and  $-380 \text{ kcal/d}$  [–1170/19] respectively, and from D8–D30 were  $0.97 \text{ g/kg}$  [0.82–1.11], and  $-7 \text{ kcal}$  [–259/78] respectively. Patients had higher median blood glucose from D1–D5 ( $7.67$  vs  $7.49 \text{ mmol/l}$ ). During D1–D5, blood glucose was correlated insulin intake ( $r^2 = 0.41$ ,  $p < 0.001$ ), but only weakly with glucose intake, and not with C-Reactive-Protein, without difference in septic and non-septic patients.

**Conclusions:** The long-stayers were characterized by a high NRS-score, highest in those dying. Variability of nutritional variables compared to the protocol was a striking characteristic. The energy and protein intakes were very variable during the first week resulting in moderate negative balances: protein intakes were below the ICU recommendation. Blood glucose exhibited highest variability during the first 5 days, without any clear association with glucose intake nor with inflammatory status.

**Disclosure of Interest:** None declared.

#### SUN-PO024

##### EVALUATION OF NORADRENALINE EFFECT ON ENERGY DEFICIT AND MORTALITY OF CRITICAL PATIENTS IN ENTERAL NUTRITIONAL THERAPY

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**Rationale:** Early enteral nutrition is indicated in the critical patient since hemodynamically stable. However, on patients who demands the use of vasopressor drugs and still hemodynamically unstable, it's recommended to postpone enteral nutrition start. There are few evidences that support the safety and tolerance of enteral nutrition (EN) in this group of patients. This study main goals are to evaluate the effect of noradrenaline (NORA) use on mortality after 60 days of Intensive Care Unit (ICU) stay and energy deficit in the first week of hospitalization of critically ill patients in exclusive EN.

**Methods:** A two years (2014–2016) prospective observational study, performed in ICU and emergencies of a tertiary hospital, with 327 patients. Were excluded patients with ICU stay  $< 48$  h, absence of data and age  $< 18$  years. Energy deficit was estimated from the period that the patient remained on fasting in the first week of hospitalization. Logistic regression model and Mann-Whitney U test were performed to assess statistical associations and significances.

**Results:** There were 327 admissions with an exclusion of 72 patients (255 subjects recruited). 62,3% of the patients were male, with age 52

and 53 for the group NORA and the group that didn't use nora (non-NORA), respectively. 51,8% used NORA in first week of hospitalization. The NORA group had significantly higher values of SOFA and APACHE II than the non-NORA group ( $p: 0.000$ ). There was no significant difference in caloric intake between the NORA group and the non-NORA group ( $p: 0.350$ ). NORA patients had 84% higher risk of mortality (OR: 1.844; IC 95% 1.00–3.37;  $p: 0.047$ ) compared to the non-NORA group. As a main result, each increase of 25% in the amount of calories received, results in 36.4% chance of reduction in the mortality risk, regardless whether noradrenaline was used or not (OR: 0.636; IC 95% 0.49–0.82  $p: 0.001$ ).

**Conclusions:** The use of noradrenaline didn't withhold the initiation of EN in critical patients in the first week of hospitalization in this sample. The amount of EN received acted as a protective factor in this group of patients, regardless whether noradrenaline was used or not.

**Disclosure of Interest:** None declared.

#### SUN-PO025 THE EFFECT OF NUTRITIONAL STATUS AND ENERGY TARGET ON MORTALITY: A PROSPECTIVE COHORT STUDY

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**Rationale:** Trauma is one of the most prevalent causes of death and admission to Intensive care units (ICU) worldwide. These patients are catabolic, have increased nutritional requirements and are at risk of malnutrition and higher mortality. Malnutrition screening and diagnosis are paramount for appropriate dietary intervention. This study main goals are to identify malnourished patients and provide adequate nutrition. We postulate that reaching nutritional targets will have a protective effect on mortality risk.

**Methods:** A two year (04/2015–02/2017) prospective observational study of 478 trauma ICU patients. Excluded were: ICU < 48 h, pregnancy, suspicion of brain death and not tube fed. Malnutrition screening and diagnosis were through the AND-ASPEN tool within 48 h admission. Energy intake were recorded for the first week. Logistic regression model was performed to assess mortality as main outcome with independent variables: sex, weight and malnutrition.

**Results:** There were 478 trauma patients admission with an exclusion of 150; 328 subjects recruited. Patients were male (84.1% vs 84.9%) and with median age of 44 and 33 y for the malnourished and non-malnourished group respectively. Malnourished subjects were 29.1% and achieved a higher energy intake ( $17.1 \text{ kcal/kg/d} \times 14.4 \text{ kcal/kg/d}$ ;  $p: 0.001$ ) compared to the non-malnourished group. For the mortality outcome, the protective effect of nutrition was 70% (OR: 0.290; IC 95% 0.09–0.97;  $p: 0.044$ ) and 65% (OR: 0.35; IC 95% 0.18–0.67;  $p: 0.001$ ) respectively for malnourished and non-malnourished group when achieving  $\geq 75\%$  of nutrition target.

**Conclusions:** It is important to identify at-risk patients who are already malnourished to initiate early intervention. A higher energy intake has a protective effect on mortality in trauma ICU patients. Understanding the impact of nutrition is an important part of evaluating this evolving therapy and essential for an effective nutrition plan.

**Disclosure of Interest:** None declared.

#### SUN-PO026 PREVALENCE OF REFEEDING HYPOPHOSPHATEMIA IN PATIENTS FEDED BY ENTERAL NUTRITION IN THE INTENSIVE CARE UNIT: SEVEN-DAY FOLLOW-UP RESULTS AFTER NUTRITION

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**Rationale:** Refeeding Hypophosphatemia (RH) is common in critically ill patients and is associated with high morbidity/mortality. The aim of this study was to determine the frequency of RH in critically ill patients fed enterally in the acute phase.

**Methods:** This study was performed prospectively in Erciyes University Medical Intensive Care Unit. Started to feed within 72 hours after hospitalization, patients aged 18 years and over, 48 hours or more enteral fed were included in the study. If phosphorus was below 2.4 mg/dl, hypophosphatemia was considered.

**Results:** Study was performed with 100 patients. The mean age was  $57 \pm 20$  years. The mean APACHE II score was  $22 \pm 8$ . The mean NUTRIC score of the patients was  $5 \pm 2$ . The number of 71% patients were nasoduodenal and 17% patients were fed via nasogastric route. The target caloric requirement of the patients was  $1835 \pm 303 \text{ kcal/day}$ . Patients received calories were  $888 \pm 362$ ,  $1254 \pm 674$ ,  $1383 \pm 660$  and  $1462 \pm 580 \text{ kcal/day}$  on 1, 3, 4 and 7 days respectively. The average phosphorus levels of patients and the incidence of hypophosphatemia during the follow-up period are shown in Table 1. The mean K value of the patients on the first day was  $4.3 \pm 0.96 \text{ mmol/L}$ , Mg value was  $0.9 \pm 0.18 \text{ mg/dL}$  and Ca value was  $9.0 \pm 0.8 \text{ mg/dL}$ . The incidence of RH in any day during the seven-day follow-up of the patients was 52%.

**Table 1.**  
The mean phosphorus levels of patients and the frequency of hypophosphatemia during the follow-up period

Day	Phosphorus (mg/dL)	Frequency of RH (%)
Day 1, $\pm$ SD	$3.6 \pm 1.53$	20
Day 3, $\pm$ SD	$3.2 \pm 1.52$	32
Day 4, $\pm$ SD	$3.3 \pm 1.05$	21
Day 7, $\pm$ SD	$3.9 \pm 1.53$	12

**Conclusions:** As a result of this study, the frequency of RH was found to be high in critically ill patients fed enterally. The highest rate was detected on the third day. More studies are needed on this subject.

**Disclosure of Interest:** None declared.

#### SUN-PO027 PROTEIN TARGET IN CRITICALLY ILL PATIENTS. IS IT POSSIBLE TO ACHIEVE?

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**Rationale:** Demonstrate if it is possible to administer the protein requirement of critical patients and the main reasons that prevent this offer in a hospital with multidisciplinary team of active nutritional therapy.

**Methods:** Retrospective, quantitative study with data collected between October/2018 and March/2019 of 107 adult and elderly patients admitted to the ICU of a private hospital in the city of São



Paulo/Brazil. To calculate protein target, the ESPEN reference was used for critical patients, considering 80% of the target as a minimum supply. Data were analyzed in Excel spreadsheet.

**Results:** In October, November and December 2018, the offer of at least 80% of the target was possible to 88%, 87% and 91%, respectively. In January, February and March in 2019, the offer was 81%, 71% and 91%, respectively. Of the 107 patients, 15 (14%) did not receive the minimum goal, the main causes being: abdominal distension (40%), diarrhea (27%), failure to progress in volume (26.5%) and recurrence of fasting to the center (6.5%). The main diagnoses involved respiratory tract infection (49%) and the mean length of ICU stay was 10.7 days.

**Conclusions:** The results show that about 85% of critically ill patients received adequate protein supply and that the main causes for inadequate intake are related to gastrointestinal symptoms. It is important to emphasize that adequate protein supply improves clinical outcomes and that a well-established multidisciplinary team with established protocols is fundamental to act in the face of nutritional therapy management.

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**Disclosure of Interest:** None declared.

#### SUN-PO028

##### PARENTERAL NUTRITION IS ONE OF THE MOST SIGNIFICANT RISK FACTORS FOR NOSOCOMIAL INFECTIONS IN ADULT PATIENTS WITH INTESTINAL FAILURE

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**Rationale:** Intestinal failure (IF), the condition itself, and its management were associated with increased infection complications and impair patients' quality of life. This study was aimed to evaluate the prevalence and potential risk factors of nosocomial infections (NIs) in hospitalized adult patients with intestinal failure.

**Methods:** Two hundreds and fifty-nine eligible adult patients with IF admitted to a single clinical nutrition center in a tertiary referral hospital from January 1, 2012 to December 31, 2018 were retrospectively identified from a prospectively maintained database. NIs was defined according the definition from the 2008 Centers for Disease Control and Prevention criteria. The prevalence and independent risk factor of NIs were analyzed.

**Results:** The prevalence of NIs was 25.5%, with 113 episodes of NIs occurred in 66 patients. The most common NIs were pneumonia (14.3%), followed by bacteremia of unknown origin (13.5%), catheter-related bloodstream infection (5.0%), lower respiratory tract infection (5.0%), surgical site infection (3.9%) and urinary tract infection (1.9%). Multivariate analysis revealed that decreased serum albumin in admission, presence of gallbladder stone or cholestasis and prolonged duration of PN were independent predictors of NIs, while older age, decreased serum albumin in admission and prolonged duration of PN were significantly associated with pneumonia.

**Conclusions:** NIs was significantly prevalent in adult hospitalized patients with IF. The prolonged duration of PN was one of the most significant predictors for NIs.

**Disclosure of Interest:** None declared.

#### SUN-PO029

##### PARENTERAL NUTRITION INDUCED THERMOGENESIS DOES NOT INFLUENCE MEASURED RESTING ENERGY EXPENDITURE DURING CVVH

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**Rationale:** Indirect calorimetry (IC)-guided caloric delivery and adequate protein provision is correlated with increased survival in critically ill adult patients. Parenteral nutrition (PN) induces thermogenesis which may increase REE by 7%, suggesting that IC best should be performed in unfed patients. We investigated whether PN-based nutrition influenced REE in the particular setting of continuous venovenous hemofiltration (CVVH).

**Methods:** Retrospective analysis of data from the prospective MECCIAS trial (NCT03314363) which investigated the effect of CVVH on gas exchange and validated IC use during CVVH. During this trial, patients daily received a 1L ready-to-use multichamber PN bag (Olimel N9 Baxter<sup>®</sup>) containing a double-dose vitamins and triple-dose trace-elements during IC measurements.

**Results:** Eight mechanically ventilated critically ill adult patients undergoing CVVH were studied. CVVH was performed with Prisma<sup>®</sup> 18/0 (Baxter<sup>®</sup>) in predilution at a median flow of 1600 (range 1463–1838) ml/h and median blood flow of 9000 (range 9000–9000) ml/h. Measured median REE values were 1208 (range 1037–2275) and 1163 (range 864–2229) Kcal/day, respectively without and with PN (p = 0.19).

**Conclusions:** Measured REE is not significantly altered by PN in mechanically ventilated adult critically ill patients receiving CVVH. IC remains a reliable tool to assess caloric needs in these patients.

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#### SUN-PO031

##### THE PROCESSED POWDER OF JERUSALEM ARTICHOKE (*HELIANTHUS TUBEROSUS* L.) TUBER MIXING IN HOSPITAL ENTERAL FEEDING FORMULA FOR DIARRHEA PATIENT IN SURGICAL INTENSIVE CARE UNIT: PREPARATION METHOD AND CLINICAL PILOT STUDY

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**Rationale:** The Jerusalem artichoke (*Helianthus tuberosus* L.) is a tuber crop and has the components of soluble fiber especially the fructans (Inulin and oligofructose). Our previous reports using mixed fiber on commercial formula in surgical critically ill patient demonstrated reducing of diarrhea score. The objective of this study was to find the processed method of Jerusalem artichoke fiber into powder and tested the physical properties and dietary fiber components as well as the pilot clinical use in diarrhea patient in surgical intensive care unit (ICU).

**Methods:** The Jerusalem artichoke tuber was processed by rotary vacuum microwave, hot dry air blower, and then blender-hammer mill machine into 600 micrometers in size. The dietary fiber components of processed powder were analyzed. Regarding the clinical pilot, the selected diarrhea patient in surgical ICU was received of 2 gram in each 100 mL of hospital enteral feeding formula for 5 days. The daily diarrhea score was recorded. The diarrhea was defined when the King's stool chart score  $\geq 12$ .

**Results:** The swelling artichoke powder particle was very low. The mixing of hospital blenderized diet formula increased the viscosity only 0.6–0.7 RVU. The component of dietary fiber was comprised of 20.8–21.6% and fructans (inulin and oligofructose) 66.0–71.5%. After mixing this powder into the hospital enteral formula in 11 patients who suffering from diarrhea [median of score (interquartile range) 18 (12–26)], the diarrhea was improve (diarrhea score  $< 12$ ) in 7/11 patient (63.6%) at the 5th day. The effect of improving was begin at 2nd day [diarrhea score: 15 (8–32);  $p = 0.03$ ] and significant improve at 4th and 5th day [9(5–24);  $p < 0.01$  and 8(5–24);  $p < 0.01$  respectively]. There were no report of vomiting and tube clogging between the study period. Three patients had the high gastric residual volume ( $> 200$  mL) in the study period.

**Conclusions:** The processed powder of Jerusalem artichoke tuber mixing in hospital enteral feeding formula might be improve the diarrhea score. However, the future randomized control trial should be performed for demonstrate the more valid results.

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**Disclosure of Interest:** None declared.

## Geriatrics I

### SUN-PO032

#### DOES THE INTAKE OF NUTRIENTS ASSOCIATED WITH CARDIOMETABOLIC RISK DIFFER ACCORDING TO OCCUPATIONAL STATUS IN 60–65-YEAR-OLD SUBJECTS? PRELIMINARY RESULTS

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**Rationale:** The aim of the study was to compare the intake of those nutrients which are associated with cardiometabolic risk in pre-elderly subjects.

**Methods:** We recruited 300 subjects aged 60–65 and divided into three equal groups of white-collar, blue-collar workers and unemployed subjects; 50% were women. Anthropometric measurements and clinical interview were conducted, metabolic syndrome was assessed according to International Diabetes Federation. The pattern of consumption of various nutrients was analyzed in detail.

**Results:** The most beneficial intake of nutrients was in the white collar women: vitamin C [103 mg (68–159)], % energy from saturated fats (SFA) [10.8 (7.1–13.7)], the amount of kilocalories per 1 gram of fiber [78 kcal (5–103)], sodium [2761 mg (1922–4108)]. Metabolic syndrome occurred in 72% of subjects in this group.

Among men, the highest sodium intake [4216 mg (3142–5660)], the highest % SFA energy [14.5 (10.6–17.6)] and the least favorable index of kcal per 1 g of fiber (106 kcal (91–149)) occurred in the group of blue-collar workers. The incidence of metabolic syndrome in this group was 78% of the subjects.

**Conclusions:** Occupational status differentiated the level of consumption of the assessed nutrients. The most convergent with recommendations diet occurred in white collar workers group, the least beneficial in blue collar workers. Multifactor analyzes can determine to what extent the diet as compared to other factors, eg lifestyle, smoking determines the risk of metabolic syndrome.

**Disclosure of Interest:** None declared.

### SUN-PO033

#### INFLUENCE OF PHYSICAL EXERCISE AND PROTEIN SUPPLEMENTATION IN QUALITY OF LIFE (SF36) IN SENIORS TO LIVE IN THE COMMUNITY

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**Rationale:** Ageing is characterized by a gradual loss of functions, being a natural and physiological process and markedly heterogeneous. However it is possible to modify the trajectories of functional decline and promote successful ageing; physical exercise and nutrition have shown benefits in the promotion of better quality of life. The objective of this study to verify the influence of protein supplementation associated with the practice of physical exercise in Quality of life (QoL) in Seniors living in the community.

**Methods:** A clinical, prospective, double-blind, randomized, placebo-controlled study was developed. Sample was probabilistic and randomly assigned. Subjects were distributed through the 4 arms of the study with 19 participants each: 1-physical exercise (strength and resistance)+protein supplement (20 g); 2-physical exercise (strength and resistance)+placebo; 3-only protein supplement (20 g); 4-control group, without intervention. Each of the 4 groups was assessed at baseline and after 12 weeks.

QoL was assessed through SF36 questionnaire, before and after intervention. Descriptive and inferential statistics were used.

**Results:** The sample consisted of 79 individuals, 55 women and 25 men, with a mean age of  $68.54 \pm 5.72$  years, mean height  $1.57 \pm 0.09$  m, mean weight  $72.7 \pm 14.3$  kg, being homogeneous with respect to age, sex and the anthropometric characteristics (BMI, arm and leg circumference). Groups 1 and 2 significantly improved their QoL ( $p < 0.05$ ) during the study. QoL improvement was greater in groups 1 and 3 than 2 and 4 ( $p < 0.05$ ).

Subjects in group 4 worsened their outcomes in all domains of QoL assessed.

**Conclusions:** Protein supplementation revealed a positive influence on QoL, especially when associated with exercise. In fact, seniors who were not supplemented and did not performed a prescribed exercise (control group) showed a worsening of their QoL throughout the study.

**Disclosure of Interest:** None declared.

### SUN-PO034 PREVALENCE OF OBESE OLDER MALNOURISHED ADULTS AND COVERAGE OF THEIR PROTEIN NEEDS IN A TERTIARY CENTER

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**Rationale:** Meeting appropriate coverage of protein needs is a major challenge in older adults (OA). This study aimed at evaluating the prevalence of obese malnourished older adults and the coverage of protein needs in a geriatric population, comparing obese/malnourished (OM) to obese/well-nourished (OW), non-obese/malnourished (NOM), and non-obese/well-nourished (NOWN) individuals.

**Methods:** This retrospective study included 1936 subjects followed at the University of Lausanne during 2013–2015. 870 fulfilled the inclusion criteria ( $\geq 70$  years). Malnutrition was assessed according to the GLIM (Global Leadership Initiative on Malnutrition) criteria. Obesity was defined as a BMI  $\geq 30$  kg/m<sup>2</sup>. Protein needs were estimated to be 1.1 g/kg for the obese patients based on established recommendations. Amount of food consumption was assessed by a dietitian.

**Results:** Mean age was  $81 \pm 7$  years and mean BMI was  $24 \pm 5$  kg/m<sup>2</sup>. Eighty (9%) were obese, and among them 20 (25%) were malnourished, corresponding to 2.3% of the 870 OA. The protein coverage was  $42 \pm 25$  g for OM,  $45 \pm 25$  g for OW,  $51 \pm 25$  g for NOM, and  $55 \pm 24$  g for the NOWN group, with a statistical difference between the OM and NOWN groups ( $p = 0.029$ ). Only 1 patient among the OM group received nutritional support.

**Conclusions:** A large fraction (25%) of older and obese patients were found to be malnourished. The protein coverage was found to be very low with 42% of the actual needs. Although an adequate protein intake is particularly important for this vulnerable population in order to maintain lean body mass, only 1/20 patients received nutritional support. The findings suggest 1) an inappropriate coverage of protein needs in this cohort followed at a tertiary center and 2) emphasize the need for implementing structured guidance for the care of OA, a particularly vulnerable high-risk population.

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**Disclosure of Interest:** None declared.

### SUN-PO035 NUTRITIONAL STATUS IN INSTITUTIONALIZED OLDER ADULTS WITH COGNITIVE IMPAIRMENT

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**Rationale:** Older people with cognitive impairment are more vulnerable to malnutrition. Our study aimed to assess the nutritional status in a group of institutionalized Lebanese elderly with cognitive impairment, and the factors associated with malnutrition.

**Methods:** It was a cross-sectional observational study. Candidates aged 65 and above with cognitive impairment were recruited from 7 Lebanese institutions. Data were collected from medical records,

questionnaires and clinical examination. Sociodemographic characteristics, type and route of feeding, presence of chronic diseases, drug intake and results of biological examinations performed during the last 3 months were collected. Patient independence was assessed using the Activity of Daily Living questionnaire (ADL). The anthropometric measurements assessing the nutritional status of patients were BMI (Kg/m<sup>2</sup>), upper arm circumference (cm), calf circumference (cm) and triceps skinfold (cm). The examination of the number of functional dental units (FU) and the clinical evaluation of pressure ulcers were performed. Univariate analyses followed by multiple regression analyses were performed to assess the factors associated with malnutrition.

**Results:** One hundred and three participants (27 men and 76 women) with a mean age of  $83.90 \pm 8.74$  years were recruited. 64.1% had severe dementia, 48.5% needed feeding assistance, 53.4% were bedridden and 4.3% had pressure ulcers. The mean values of the upper arm circumference, the calf circumference, the triceps skinfold and the albumin level were  $22.73 \pm 3.14$  cm,  $27.14 \pm 4.96$  cm,  $3.94 \pm 2.29$  cm, and  $3.60 \pm 0.46$  g/dL, respectively. Gender, ADL score, dysphagia, FU number and enteral feeding were associated with malnutrition ( $p$ -value  $< 0.05$ ).

**Conclusions:** The assessment of nutritional status of elderly patients with cognitive impairment should be periodic and integrate several clinical and biological parameters, in order to avoid the complications of malnutrition.

**Disclosure of Interest:** None declared.

### SUN-PO036 EVALUATION OF DYNAMIC SERUM THIOL/DISULFIDE HOMEOSTASIS IN SARCOPENIC &NON-SARCOPENIC ELDERLY

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**Rationale:** Sarcopenia is a syndrome characterized by progressive and generalized loss of skeletal muscle mass and chronic inflammatory conditions are in the pathogenesis. As an indicator of antioxidant capacity, thiol/disulfide homeostasis regulates detoxification and antioxidant defense mechanisms. In this study, we aimed to evaluate the thiol/disulfide homeostasis and ischemic modified albumin levels in elderly patients.

**Methods:** Totally 95 patients who were admitted to a geriatric outpatient clinic were included. Sarcopenia diagnosed according to EWGSOP2 criterion (1). Serum samples for the thiol-disulphide test and albumin levels obtained at the time of sarcopenia evaluation and measured according to clinical and laboratory features (2, 3). Patients were divided into two groups according to their sarcopenia presence as normal and dyno-sarcopenia (dynopenia+sarcopenia+severe sarcopenia).

**Results:** Overall, 95 patients were included in this study. Median age was 76 (IQR: 13) years and female patients were 73.3% of all study population. Forty-two patients (44.2%) were normal, 39 patients (41.1%) were diagnosed as pre-sarcopenia (dynopenia), three patients (3.2%) were sarcopenic and 11 patients (11.6%) were severe sarcopenic. Demographic characteristics and laboratory findings of the study population were in the Table 1. The levels of native thiol and total thiol were lower while the disulphide level and disulphide/native thiol, native thiol/total thiol and disulphide/total thiol ratios were similar in patients with sarcopenia when compared with those in the control



group. In addition, there were no difference between albumin and ischemia modified albumin levels. Positive correlation detected between handgrip strength, 4 meter walking speed and native thiol & total thiol, disulphide levels. In addition, there was a negative correlation between age and native thiol & total thiol levels.

**Table 1**  
Demographic characteristics and laboratory findings of the study population

	Normal (n:42)	Dyno-Sarcopenia (n:53)	P value
	Median (IQR)	Median (IQR)	
Age (years)	71 (10)	79 (11)	<0.001
Female Gender (%)	48.6%	51.4%	0.152
Diabetes Mellitus (%)	39%	25%	0.16
Hypertension (%)	80.5%	62.7%	0.06
Hyperlipidemia (%)	29.3%	21.6%	0.39
Coronary artery disease (%)	17.1%	9.8%	0.30
BMI (kg/m <sup>2</sup> )	28.8 (9.3)	26.6 (7)	0.023
Waist circumference (cm) (mean±SD)	104 ± 16	96 ± 18	0.047
Hip circumference (cm)	113 (14)	108 (18)	0.045
Albumin	4.14 (0.15)	4.11 (0.17)	0.65
Ischemia modified albumin	0.78 (0.15)	0.77 (0.11)	0.75
Native thiol (µmol/l)	400.5 (94.4)	376.0 (102.4)	0.019
Total thiol (µmol/l)	440.6 (120.7)	406.1 (112.1)	0.023
Disulphide (µmol/l)	18.7 (10.6)	13.7 (15)	0.109

**Conclusions:** Derangements of thiol/disulfide homeostasis may have a role in sarcopenia pathogenesis and the lower levels of anti-oxidative may relate to sarcopenia. The diagnostic and prognostic values of thiol/disulfide products and ischemia modified albumin need to identify with further studies.

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**Disclosure of Interest:** None declared.

#### SUN-PO037

##### EATING CHALLENGES ASSOCIATED WITH ENERGY INTAKE OF LONG TERM CARE RESIDENTS WITH COGNITIVE IMPAIRMENT: MAKING THE MOST OF MEALTIMES (M3)

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**Rationale:** Long term care (LTC) residents with cognitive impairment (CI) are at an increased risk for malnutrition, which is further complicated by their eating challenges (i.e., refusing to eat, spitting out food, etc.). The objective of this study was to examine the

association between diverse eating challenges and energy intake of LTC residents with CI.

**Methods:** Secondary data analysis was conducted from the M3 study; a cross sectional research project that examined the determinants of food and fluid intake of older adults in 32 LTC homes in four Canadian provinces (Alberta, Manitoba, Ontario and New Brunswick), using data of participants with CI (n = 353; ≥3 Cognitive Performance Scale). Eating challenges were assessed using: Relational Behavioural Scale, Edinburgh Feeding Evaluation in Dementia (Ed-FED), nine additional eating challenges, and Mealtime Relational Care Checklist. Univariate linear regression was used at a significance level of <0.05.

**Results:** Requiring close supervision (t (347) = 3.77, p < 0.001) and physical assistance (t (347) = 4.51, p < 0.001), leaving food on the plate (t (347) = 5.64, p < 0.001), refusing to eat (t (347) = 4.13, p < 0.001) and turning head away while eating (t (347) = 2.05, p = 0.041) were associated with poor energy intake. Adjusting for age and sex, partial eating assistance and total Ed-FED score were also associated with poor intake, while dysphagia risk and 'often' receiving assistance were associated with better intake.

**Conclusions:** Eating challenges and eating assistance factors are important predictors of food intake for residents residing in LTC, but their effect is dependent on the factor. Interventions that support and promote eating independence, quality of life and address specific eating challenges are needed to improve food intake of older persons with CI in LTC.

**Disclosure of Interest:** None declared.

#### SUN-PO038

##### IMPACT OF MALNUTRITION ON QUALITY OF LIFE AND CLINICAL OUTCOMES IN OLDER PEOPLE IN THE COMMUNITY

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**Rationale:** Prior to designing and testing novel nutritional interventions, it is necessary to establish the impact of malnutrition on outcomes that are important to patients and healthcare funders, and sensitive to changes in nutritional status. The aim of this study was to measure the impact of unplanned weight loss and reduced dietary intake on quality of life and clinical outcomes.

**Methods:** 570 community-based participants (≥60 years) were recruited for a 12-month observational study if they had been in contact with healthcare or voluntary services in the previous 3 months (180 from general practice, 171 at hospital discharge, 168 from intermediate care and 51 from voluntary services). Parameters assessed at baseline: nutritional status, quality of life (EQ-5D Visual Analogue Scale (EQ-5D VAS)) and patient-reported clinical outcomes (falls, antibiotic prescriptions, A&E visits and presence of pressure sores). Data were analysed using SPSS (IBM) v25.

**Results:** 352 (62%) participants were female; mean age 77.5 (±9.4) years and BMI 25.6 (±5.9) kg/m<sup>2</sup>. At baseline, BMI was <20 kg/m<sup>2</sup> in 135 (24%) participants. It was not possible to assign a reliable MUST score to 140 (25%) participants since they were unable to recall their weight in the previous 3–6 months and there was no documented evidence of a previous weight, however 213 (37%) participants reported unplanned weight loss in the previous 3–6 months and 178 (31%) reported reduced dietary intake in the same time period. Participants with unplanned weight loss and reduced

dietary intake reported significantly poorer quality of life and an increased incidence of unfavourable clinical outcomes i.e. falls, antibiotic prescriptions, visits to accident and emergency (A&E) and pressure ulcers (see Table).

	Reduced intake (n = 178)	Adequate intake (n = 392)	p
EQ-5D VAS scores	59.8 (24.6)	70.9 (23.7)	<0.001
Falls	129 (73%)	165 (42%)	<0.001
Received antibiotics	102 (58%)	157 (40%)	<0.001
A&E visits	135 (77%)	184 (47%)	<0.001
Pressure ulcers present	24 (14%)	25 (6%)	0.045
	Weight loss (n = 213)	No weight loss (n = 357)	
EQ-5D VAS scores	60.0 (24.5)	71.7 (23.5)	<0.001
Falls	154 (73%)	140 (39%)	<0.001
Received antibiotics	119 (57%)	141 (40%)	<0.001
A&E visits	163 (78%)	156 (44%)	<0.001
Pressure ulcers present	30 (14%)	19 (5%)	0.002

Values are means (SD) for EQ-5D VAS; higher EQ-5D scores indicate better quality of life; p values are for t-test for EQ-5D VAS scores and Chi<sup>2</sup> test for other outcomes.

**Conclusions:** In this population, reported reduced dietary intake and unplanned weight loss were associated with significantly poorer quality of life and clinical outcomes. Participants are being followed up for one year to determine if changes in nutritional status are associated with changes in outcomes, and to quantify any changes. The data generated by this study will be used to calculate sample sizes for testing community-based nutritional interventions in older people identified as at risk of malnutrition.

**Disclosure of Interest:** None declared.

#### SUN-PO039

##### DRUG-INDUCED DYSPHAGIA IN ELDERLY NURSING HOME RESIDENTS

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**Rationale:** Oropharyngeal dysphagia may affect negatively both the efficacy of deglutition (leading to malnutrition and/or dehydration) and its safety (causing aspiration pneumonia). It is very frequent in elderly Nursing Home residents (NHRs) also as a side-effect of some drugs and medications (Drug-Induced Dysphagia). This study was performed in a population of Italian NHRs to evaluate how often drugs which may induce Dysphagia are prescribed to them.

**Methods:** Data on overall clinical conditions of 140 NHRs were gathered together with their therapies. Dysphagia risk was assessed by I-EAT 10, malnutrition by ESPEN Consensus Definition 2015. Drug therapies were analyzed and classified according to mechanism which may induce Dysphagia, following Balzer's classifications.

**Results:** NHRs (mean age 86,32 ± 9,11 years) were prevalently affected by neurologic diseases (70%), 92% had comorbidities. Malnutrition was diagnosed in 27,9%, dysphagia risk in 27,5%. Polypharmacy (>5 drugs) was registered in 77,9%, mean number of drugs taken daily by NHRs is 8 (min 1 – max 19). 14,7% of drugs prescribed belonging to the group which may induce dysphagia by different mechanisms: as a side effect (37,8%), as a complication of therapeutic action (31,7%), by inducing esophageal injury (29,3%) or miscellaneous agents leading to

dysphagia (1,2%). 72,7% of subjects at risk of dysphagia according to I-EAT 10 and 67,8% of subjects with previous diagnosis of dysphagia were assuming at least one drug which may induce dysphagia (min 1 – max 4).

**Conclusions:** Elderly NHRs frequently assume drugs which may cause dysphagia and interfere with their nutritional status: in our population 122 patients (86,7%). To prevent Drug-Induced Dysphagia it is necessary to obtain an accurate medication history from each patient and, when it is feasible, the offending agent has to be discontinued or replaced with a less harmful medication.

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**Disclosure of Interest:** None declared.

#### SUN-PO040

##### MALNUTRITION RISK AND IN-HOSPITAL FALLS IN OLDER PATIENTS

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**Rationale:** Falls and fall-related injuries are major causes for functional impairment and lowered quality of life among older persons. Malnutrition often comes along with reduced muscle mass and may be associated with fall incidents. This study investigates the association of malnutrition and in-hospital falls in older patients.

**Methods:** A cross-sectional, multi-centre study was conducted in 44 Austrian hospitals. Two nurses collected demographic data, data on malnutrition risk and the number of falls within the last 30 days using a standardized questionnaire. Malnutrition risk was assessed using the Malnutrition Universal Screening Tool (MUST). Non-fallers were compared to fallers with chi-square tests. Univariate and multivariate logistic regression was performed to assess the association between malnutrition risk, other predictive factors and falls.

**Results:** 3702 patients aged ≥65 years participated in the study. The overall prevalence of in-hospital falls within the last 30 days was 5.2% (n = 193). 24.3% of the patients were at risk of malnutrition according to MUST. Malnutrition risk patients fell significantly more often during their hospital stay than patients without malnutrition risk (p < 0.05). Univariate regression analysis confirmed the relationship between in-hospital falls and malnutrition risk (p < 0.05). Significant associations of falls with female sex, dementia, diseases of the nervous system, the musculoskeletal system and connective tissue, high care dependency, psychotropic medication and age were observed.

**Conclusions:** Older hospitalized patients at risk of malnutrition have a higher risk of in-hospital falls than older hospitalized patients without malnutrition risk. Fall prevention programs must consider the screening and assessment of nutritional status as well as nutritional interventions for the prevention/treatment of malnutrition risk as one important factor to achieve success.

**Disclosure of Interest:** None declared.

#### SUN-PO041

##### UNACYLATED GHRELIN PLASMA LEVELS DECREASE WITH OBESITY AND PREDICT 5-YEAR LOW MUSCLE MASS IN THE ELDERLY

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**Rationale:** Aging is associated with skeletal muscle loss, which may be paralleled by increased fat mass, both contributing to frailty and related healthcare and social costs. Unacylated ghrelin (UnAG) is an emerging modulator of skeletal muscle metabolism with potential muscle-anabolic actions, and plasma UnAG decreases with overweight-obesity [body mass index (BMI)>25 kg/m<sup>2</sup>] in general population cohorts. Potential associations between UnAG, overweight-obesity and muscle mass (MM) in elderly humans are currently unknown.

**Methods:** We investigated associations between body mass index (BMI) and ghrelin profile [total (TG), acylated (AG) and unacylated hormone (UnAG)] in 450 elderly individuals (age >65 y) from the North-East Italy MoMa population study (M/F: 179/271). After 5 years the MM index (MM/m<sup>2</sup>) was measured in 133 subjects (M/F: 72/81) by bioelectrical impedance analysis. Low MM-index was defined as 2 standard deviations lower than average MM-index in young (18–39) reference subjects from the same population study.

**Results:** In elderly subjects, UnAG was reduced ( $p < 0.01$ ) in overweight-obese compared to lean. In multiple regression analysis, UnAG was associated ( $P < 0.01$ ) with BMI independently of potential confounders, including gender, metabolic and inflammatory markers. In logistic regression analysis, lower basal UnAG predicted ( $p < 0.05$ ) low MM-index independently of BMI, gender and metabolic confounders.

**Conclusions:** In elderly subjects from a North-East Italy general population cohort, unacylated ghrelin is lower in overweight-obese compared to lean individuals and it predicts 5-year muscle mass independently from BMI. The current results suggest that lower UnAG may contribute to lower muscle mass in obese elderly individuals.

**Disclosure of Interest:** None declared.

#### SUN-PO042

##### REGIONAL PARTNERSHIP AND INTEGRATION ON DYSPHAGEAL DIET IN JAPAN, LITERATURE SURVEY IN THE JAPANESE LANGUAGE

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**Rationale:** As getting super-aged society, disturbance of swallowing is one of big medical issue in Japan. At many hospitals and care facilities dysphagia diet is served as to the ability of swallowing, but there is a broad variation in modified textures and that's name. Recently, many attempts are reported about regional partnership and integration on dysphagia diet in JAPAN. But, most of them are written in the Japanese language.

**Methods:** The literature survey was done on the April 1st 2019, in the Japanese language on three Japanese medical database; Japan Medical Abstracts Society, JDreamIII and MEDLINE. The search term was selected which means 'dysphagia diet' and 'region' or 'partnership' or 'integration' in English.

**Results:** Since 2000 to 2018, 765 literatures were found. Among them 293(38%) were about trial within one institution, 274(36%) regional (multi institutions or City area) partnership, 39(14%) broad area (one or two prefectures and rest are review papers. At first 'the dysphagia diet pyramid' was used as the criteria of dysphagia diet, after publication of 'The Japanese Dysphagia diet 2013' most of the literatures were based on it. Recently visual expression of dysphagia diet using color photo, 'dysphagia diet map' is developed and is spreading calmly. The difference among each prefecture was very

large: 0~over100, three prefectures had over 50 literatures, Tokyo, Kanagawa and Aichi, but, four had one or less.

**Conclusions:** Regional partnership and integration on dysphagia diet is spreading in Japan, but the difference among each prefecture is still very large. To make up the community-based integrated care system to overcome super-aged society, countermeasure against dysphagia is essential. In 2017 the International Dysphagia Diet Standardisation Initiative (IDDSI) was published. Taking this opportunity, we should develop further regional partnership and integration on dysphagia using new standardization.

**Disclosure of Interest:** None declared.

#### SUN-PO043

##### EFFECTS OF ORAL NUTRITIONAL SUPPLEMENT ON NUTRITIONAL STATUS AND MUSCLE FUNCTION: A RANDOMIZED, CONTROLLED TRIAL IN COMMUNITY-DWELL ELDERLY

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**Rationale:** To evaluate the benefits of health counseling with or without oral nutrition supplementation (ONS) in community elderly with malnutrition risk.

**Methods: Design:** Randomized controlled intervention trial (ChiCTR-IOR-17012959).

**Setting:** Two Community Health Service Centers in Shanghai.

**Participants:** Two hundred and one older people.

**Intervention:** Weekly health consultation and receiving ONS (2 serving Ensure Complete<sup>®</sup>, 460 kcal, 17 g protein per day) for 3 months. Control: weekly health counseling.

**Method:** 201 community based Chinese elderly ages  $\geq 60$  years with risk of malnutrition were randomized into 2 groups: health counseling with ONS (N = 101) or without ONS (N = 100). Nutritional (MNA-SF, weight, body mass index [BMI], calf circumferences), functional parameters (handgrip strength, gait speed, Activity of Daily Living [ADL]) and experimental index (transferrin, prealbumin, hemoglobin) were measured at baseline and after 12 weeks (T2). ONS intake was registered daily and compliance calculated.

**Results:** A total of 182 community-dwell older people ( $75.48 \pm 7.47$  years) completed this study. Median compliance was 81.9% (95% confidence interval (CI) = 77.8%–85.9%), median intake of 353 kcal (95% confidence interval (CI) = 336–371) per day. There was significant difference in change in MNA-SF score between supplement and control groups ( $p = 0.023$ ). Compared to the control group, body weight, handgrip strength increased significantly in the supplement group ( $p = 0.003, 0.005$ ). There were no significant between-group differences in calf circumferences, gait speed and ADL. In addition, between baseline and 12 weeks in the two groups, the change of blood levels of transferrin, ( $p = 0.031$ ), prealbumin ( $p = 0.018$ ) had increased and plasma hemoglobin had no difference ( $p = 0.986$ ).

**Conclusions:** ONS was well accepted among undernourished older people in community-dwell, which resulted in significant improvements of nutritional status. ONS might be a good strategy to improve nutrition status and long-lasting strength in elderly.

**Disclosure of Interest:** None declared.



#### SUN-PO044 NUTRITIONAL EVALUATION IN A GERIATRIC CLINIC

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**Rationale:** The frail geriatric population (+65 years) has specificities and needs only met by a multidisciplinary approach. The Geriatric assessment is multidimensional and nutrition is an essential component, interacting with body composition and other geriatric syndromes (including dementia falls and frailty). Nutrition wise, this population faces precise challenges, mostly undernutrition, sarcopenia and cachexia, and more recently obesity.

The aim of this work is to assess the nutritional evaluation of the first 6 months of patients followed in our Geriatric Clinic that gathers nurses, dietitians, pharmacists, physicians, and social workers.

**Methods:** Patients at the clinic were assessed in terms of nutrition by the MNA score, BMI, and handgrip. Geriatric assessment including functional status (Katz and Lawton & Brody scores), falls evaluation (Holden score), depression evaluation (Yesavage), frailty (PRISMA7), comorbidities and polypharmacy was made.

**Results:** Data from 34 patients attending the Geriatrics clinic was analyzed, yielding a female preponderance (65%). Mean age was 79,7, with 23,5% young old, 53% middle old and 23,5% very old. On average, each patient had 7,4 diseases and was medicated with 8,4 drugs. Patients were mostly independent (85% by Katz and 50% by Lowton&Brody), however only 28,6% had an effective gait and time up and go was over 10 seconds in 72,7%. Also relevant, frailty screening was positive in 32,3% of patients. Depression screening recorded only slight depression in 32,3%.

Nutrition wise, average BMI was 25,4±4,6, with the majority of patients in the normal or overweight categories – 35% each, 18% were moderately obese and only 12% had underweight. MNA screening showed that 25% of patients were at risk, and 1 of them was actually malnourished. Considering handgrip, both right and left were lower than predicted: 41,4%±24 (right) and 42,5%±29,6 (left) of calculated handgrip strength.

No association was established between the demographic and geriatric assessment scores data and nutritional status.

**Conclusions:** Our data shows a normal age distribution through all age categories, with a female preponderance according to literature. Comorbidities and polypharmacy even though important, are not overwhelming. The autonomy degree for daily activities in this sample is a selection bias of this specific clinic, which aims independency gains in the frail elderly patients. The nutrition data is distressing as 25% are at nutritional risk by the MNA. The handgrip used as a prognostic factor also shows that patients are at risk.

The small sample from our Geriatric Clinic (of a highly selected elderly population), limits the establishment of associations and the development of risk and prognostic factors.

**Disclosure of Interest:** None declared.

#### SUN-PO045 STUDY OF PROBLEMS ENCOUNTERED DURING 390 MENU COMMISSIONS IN 60 NURSING HOMES IN THE FRENCH LIMOUSIN TERRITORY

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**Rationale:** The menu commissions (MC) of nursing homes (NH) control and guide the nutritional policy of these institutions. We know how they work [1], but not the problems raised. The objective of the study was to identify the problems reported during MCs in NH in Limousin territory.

**Methods:** The MCs operated according to procedures described elsewhere [2], with the systematic participation of a dietician from the health network ARS Limousin Nutrition (LINUT) who also took over the reporting of results. Difficulties encountered were noted for the following criteria: accompaniments (vegetables or starches), beverages, entries, desserts, suppliers, fruit, waste, links between cooking and care, menus, bread, replacement dishes, service, protein dishes, soups, dairy products, pastry preparations, diets, sauces, textures. The results are only descriptive.

**Results:** 390 CM from 60 different EHPAD were analysed in 2016 and 2017, covering 4 French departments. Table 1 shows the prevalence of the 10 most reported problems, in decreasing %. Perception of waste, links with suppliers or between kitchens and health care sectors, bread were the least problematic (12.3, 10.0, 8.2 and 6.7% respectively). For the feed itself, these were quality problems in 21.2 ± 8.0% of cases, poorly adapted textures in 19.1 ± 9.8% of cases, defective grammages in 14.0 ± 8.3% of cases, variety, cooking or seasoning concerns were less frequent (respectively 7.1 ± 7.2, 6.7 ± 5.4 and 5.5 ± 4.1% of cases). Difficulties related to service were organizational (41.0% of cases), including inadequate durations and hours of service, dishwasher non-compliances (35.6% of cases), including equipment defects or hygiene problems, presentations deemed to be poor (16.7% of cases), and they occurred mostly in the evening (46.1% of cases). Mixed and chopped textures had the most problems (55.4% and 31.0% of cases respectively). Regimens caused difficulties in 23.9% of cases, and 46.2% of these difficulties were related to diabetic regimens.

**Conclusions:** Quality of food is still a major issue raised during the NH MCs. It may be linked to unappetizing or monotonous preparations, but also to insufficient resources allocated to the food or the pathologies of residents. The issue of textures is a concern, probably linked with the high number of swallowing disorders in residents, but also with the difficulties of staff in apprehending and managing these disorders, all the more so since from one institution to another a single name may correspond to different textures. Difficulties with the service are noted in almost 60% of cases, which are of organisational origin or due to the equipment and therefore more easily soluble. Food waste is very little perceived as a problem in MCs. These results point towards many ways to improve the provision of food in EHPAD.

**Table 1** (abstract: SUN-PO045): Prevalence of Top 10 problems encountered.

Protein dishes	Accompaniments	Service	Textures	Entries	Soups	Sauces	Fruits	Dairy products	Desserts
87.4%	72.5%	59.1%	49.6%	46.3%	45.0%	40.1%	38.6%	33.9%	35.6%

## References

1. Baptiste et al. *Nutr Clin Metab* 2016;30:284–9.
2. Massoulard et al. *Nutr Clin Metab* 2009;23:209–12.

**Disclosure of Interest:** None declared.

### SUN-PO046

#### NUTRITIONAL STATUS IN PATIENTS OVER 65 AND ITS INFLUENCE ON THE QUANTITY AND TYPE OF COMPLICATIONS OCCURRING 3, 6 AND 12 MONTHS AFTER HOSPITALIZATION

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**Rationale:** Malnutrition in hospitalized patients is associated with frequent complications and increased mortality. Numerous studies indicate that the results obtained during reliable nutritional assessment may be predictors of an increased complication rate.

The objective was to determine the prevalence of abnormal nutritional status in patients over 65 with the diagnosis of cardiovascular diseases and also to check its relationship with the duration of hospitalization and the incidence of complications over 3, 6 and 12 months of observation.

**Methods:** 76 patients over 65 years of age with cardiovascular conditions were involved in the study. Abnormal nutritional status was identified on the basis of MNA-SF test results, laboratory tests and ESPEN nutritional status assessment criteria. During 3, 6 and 12 months of observation data were collected which concerned the number of re-hospitalizations and the presence of complications.

**Results:** Abnormal nutritional status was reported in 78% of participants. It was noted that malnutrition diagnosed on the basis of laboratory findings and also on the basis of ESPEN criteria comprising the value of FFMI had a significant predictive value for prolonged hospitalization and an increased complication rate. The results of MNA-SF test performed at baseline revealed no relationship with the incidence of complications during the first stage of the study. MNA-SF results performed during each subsequent stage of the study revealed a significant association with an increased frequency of hospitalizations and complications mainly with those which had occurred within 3 months prior to the test.

**Conclusions:** The set of criteria to assess the nutritional status which has the highest predictive value as regards the duration of hospitalization and the incidence of complications includes laboratory tests and ESPEN criteria comprising the value of FFMI.

**Disclosure of Interest:** None declared.

### SUN-PO047

#### HOW TO INCREASE REFERRALS IN AN RCT AMONG FRAIL OLD PATIENTS AT NUTRITIONAL RISK

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**Rationale:** Nurses play a significant role, in including patients in intervention studies. The aim of the present observation study was to evaluate the efficacy of different initiatives to increase inclusion rate in an ongoing RCT<sup>1</sup>.

**Methods:** A three-step approach were used. 1) Prior initiation of the study, posters were developed, and introduction meetings were performed to inform nursing staff of their role in the recruitment process. 2) In this period a reward cake arrangement was introduced, and the research dietitians attended staff meetings and identified possible participants. 3) In addition to initiative 2) systematic weekly nutritional screening was performed by the research dietitians, based on the nurse's identification of potential participants in one ward. The first period consisted of 15 weeks, the second period consisted of 21 weeks, and the third period consisted of 10 weeks.

**Results:** In the first period, the average of referrals was 1.7/week (n = 25). We found a 74% increase (p = 0.03) in referrals to 2.9/week (n = 61) when comparing the first period with the second period. In the third period, an average of 3.1 referrals per week was seen (n = 28). This was a significant increase (p = 0.02) of 87% compared with the first period. Specifically, the systematic screening at one ward increased referrals with 112% (P = 0.009).

**Conclusions:** It is possible to increase the inclusion of participants, by close cooperation between research dietitians and nurses.

## Reference

1. Clinical trial ID: NCT03488329

**Disclosure of Interest:** None declared.

### SUN-PO048

#### SENSORY ACCEPTANCE OF FOOD DEVELOPED FOR FRAIL OLDER ADULTS

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**Rationale:** Older frail adults are at high risk of undernutrition both in the hospital and in the municipality setting. The acceptance of the food served in these settings are therefore of high importance to counteract this risk.

The aim of this study was to test the acceptance of sensory optimized, protein and energy-rich dishes specifically developed for older frail adults<sup>1</sup>.

**Methods:** Participants were recruited from the main hall at Herlev Hospital and were served food samples from one of 25 dishes. Data were obtained using a sensory questionnaire consisting of 5 questions about current appetite as well as flavor, appearance, smell, and texture of the dish. A 5-point scale was used, from 1 = dislike a lot to 5 = like a lot. Further, data on age, gender, and if they were patients or visitors were collected.

**Results:** Each dish was on average tasted 23 times, in total 585 adults completed a taste session. 54% were patients and 46% visitors, 61% women. Mean age 69 ± 13 years, 70% 65+ years. Appetite was not a confounder for acceptance of flavor. The dishes were overall ranked 4.3 ± 0.8 for flavor. No difference in scores on flavor compared with appearance was found. However, a difference in scores on flavor compared with texture 4.2 ± 0.8 (p = 0.03), and smell 4.0 ± 0.7 (p < 0.0001) was found. No difference was found in acceptance between age groups.

**Conclusions:** We found a high acceptance of all the dishes, but more studies are needed to investigate if a high acceptance equals a high consumption.

## Reference

1. Clinical trial ID: NCT03133364

**Disclosure of Interest:** None declared.

### SUN-PO049 IMPACT OF NUTRITIONAL STATUS ON DISCHARGE DESTINATION IN OLDER HOSPITALIZED PATIENTS

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**Rationale:** Prediction of discharge destination is important to provide effective treatment plan. But the prediction is sometimes difficult because various factors can affect the outcome. Malnutrition is considered to be one of important factors affecting the outcome. We report the relationship between the nutritional status and discharge destination by retrospective chart review.

**Methods:** The subjects were consecutive patients who were admitted to our hospital, from April 2017 to March 2018. Study inclusion criteria were age 65 years or older. Our hospital is an 857-bed acute care community hospital accredited by Joint Commission International. We collected the following variables from the medical records retrospectively. The candidates for prognostic factors were age, gender, hospitalized ward (medical or surgical), diagnosis (cancer or others), and mini nutritional assessment short-form (MNA-SF) on admission. The outcome measure was discharge destination (home or nursing facilities).

**Results:** The participants were 8315 patients. The mean age was 76.4 years, mean MNA-SF was 9.9 and mean length of hospital stay was 14.6 days. A total of 86.6% of patients were discharged home. All variables were statistically significant in univariate analysis. In the logistic regression analysis, following factors were statistically significant: diagnosis (non-cancer) (OR6.800, 95%CI 5.801–7.972), hospitalized ward (OR2.951, 95%CI 2.512–3.467), neuropsychological problems (OR1.996, 95%CI 1.734–2.297), food intake decline (OR1.442, 95%CI 1.291–1.611) and body mass index (OR1.122, 95%CI 1.050–1.198).

**Conclusions:** Statistically significant correlation exists between MNA-SF and discharge destination. Nutritional status should be taken into consideration in order to provide an effective treatment plan.

**Disclosure of Interest:** None declared.

### SUN-PO050 TWO FEASIBILITY STUDIES AMONG GERIATRIC PATIENTS: (FS1) PHOTO DOCUMENTATION OF FOOD AND FLUID TO ASSESS ENERGY & PROTEIN INTAKE – (FS2) CONTENT OF REFRIGERATOR AS PREDICTOR FOR READMISSION

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**Rationale:** (FS1) It can be a challenge for patients to register diet and fluid. Geriatric patients are particularly challenged due to low functional ability. Objectives: To investigate if geriatric patients had the desire and ability to take photos and if photo could be used to assess energy and protein intake. (FS2) An older study showed an empty refrigerator increased the risk of readmission<sup>1</sup>. Objective: To investigate, by means of photo, if refrigerator contents 3 days after discharge were predictive for readmission.

**Methods:** (FS1) In a RCT the intervention group of geriatric patients (n = 21) were asked if they would take photos prior to and after food and fluid intake 2 × 2 days and SMS/mail the photos prior to home visits. Control: a 48-hour diet interview conducted on visiting day. (FS2) Permission to take photos of the refrigerator contents was asked at the first home visit. The contents were evaluated adequately with ≥3

perishable durable food items. Statistical analysis (FS1): Bland-Altman plot, median.

**Results:** (FS1) 15(71%) had a smartphone, 11(73%) took photos and 7 (33%) sent photos. Bland-Altman plot and percentage median difference indicated a tendency to underestimate when using the photo method compared to dietary interviews with 14% (–25%>6%) energy intake and 13% protein intake (–31%>8%). Probably due to missing photos of snacks/drinks. (FS2) 17 photos of refrigerator contents, all evaluated adequate and not predictive of readmission.

**Conclusions:** (FS1) Geriatric patients with smartphone seem to have the desire, but in some cases lack the ability to take/send photos. Photo documentation seems to underestimate energy and protein intake compared to diet interviews. (FS2) The refrigerator content 3 days after discharge was not predictive of readmission.

#### Reference

1. Boumendjel (2000)

**Disclosure of Interest:** None declared.

### SUN-PO051 BODY COMPOSITION, ENERGY AND PROTEIN INTAKE IN INSTITUTIONALIZED PORTUGUESE OLDER ADULTS

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**Rationale:** Adequate nutritional intake (particularly energy and protein) in older adults is crucial to maintain and prevent loss of muscle mass and further deterioration of nutritional and health status. This investigation aimed to assess body composition and its relationship with energy and protein intake in institutionalized older adults.

**Methods:** Sociodemographic and anthropometric data was collected. Body composition was assessed through bioimpedance analysis (BodyStat 1500). Energy and protein intake was estimated through a food frequency questionnaire validated in the Portuguese population.

**Results:** One-hundred and forty-six older adults were included (63.3% female), with a mean age of 83 years old. Mean Body Mass Index was 25.2 ± 4.8 kg/m<sup>2</sup> (min 14.6; max 37.5). Mean Free Fat Mass Index was 15.4 ± 3.2 kg/m<sup>2</sup> (min 8.2; max 22.2). Food intake was estimated, obtaining a mean energy intake of 2011.9 ± 275.7 kcal (32.4 ± 6.9 kcal/kg Body Weight (BW)). As for protein, a mean daily intake of 76.1 ± 18.8 g (1.2 ± 0.3 g/kg BW). A strong positive correlation was found between BMI and FFMI (r = 0.670; p = 0.000). A moderate positive correlation was found between BMI and daily energy intake (r = 0.217; p = 0.037) and between BMI and daily protein intake (r = 0.363; p = 0.000). Protein intake below 1.5 g/kg BW and below 1.0 g/kg was found in 89.2% and 28.4% of the sample, respectively.

**Conclusions:** In this sample, a strong positive correlation was found between BMI and FFMI, meaning that a free fat mass height adjusted index is a better indicator of nutritional status and body composition, than percentage of free fat mass. Free fat mass declines with age, and even when a higher BMI is detected, nutritional intervention is still needed to optimize energy and protein intake, preventing further decline of nutritional and functional status of older adults.

**Disclosure of Interest:** None declared.



## Liver and gastrointestinal tract I

### SUN-PO052

#### PREVALENCE AND CHARACTERISTICS OF ADULT INTESTINAL FAILURE IN FINLAND

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**Rationale:** Details of intestinal failure (IF) in the Finnish adult population are unknown. The aim of this study was to investigate the prevalence and characteristics of adult IF in Finland.

**Methods:** An internet-based survey was emailed to all Finnish hospitals and hospital-at-home services ( $n = 111$ ) with the potential to provide parenteral support (PS) for adult IF. The participants were asked whether their unit had provided long-term PS to any patient(s) aged  $\geq 18$  years during the preceding year. If no response was obtained, the unit was phoned. Data were analysed using descriptive statistics.

**Results:** In total, 105 different health care providers responded, resulting in an overall response rate of 95%. 29 units (28%) had provided long-term PS during the preceding year. 71 cases were reported, out of which 19 cases were excluded (16 cases were reported multiple times, 3 cases didn't have IF). This left an adult IF population of 52 individual patients and a period prevalence of 12/million for the year 2017. 31% ( $n = 16$ ) of the patients had started PS during 2017. The mean patient age was  $57.6 \pm 17.2$  years and 67% were women. Short bowel syndrome was the most frequently reported underlying pathophysiology of IF (46% of cases), and majority of cases (64%) had a stoma. The mean duration for PS was  $41.9 \pm 53.1$  months (median 23, range 3–287). Almost half of the patients (48%) received parenterally both nutrition and fluids and electrolytes. Majority (54%) received PS on a daily basis. 12 patients (23%) weaned off PS during the year 2017 after receiving PS for  $24.9 \pm 24.9$  months. Successful weaning off was the most frequent reason for termination of PS, one patient (8.3%) died.

**Conclusions:** The prevalence and disease characteristics of adult IF in Finland are comparable to other Western countries. Short bowel syndrome was the most common reason for adult IF.

**Disclosure of Interest:** None declared.

### SUN-PO053

#### PEDIATRIC ACHALASIA: NUTRITIONAL STATUS BEFORE AND AFTER TREATMENT

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**Rationale:** Achalasia is an esophageal motor disorder that leads to swallowing dysfunction, which compromise feeding tolerance in children. The prevalence is about 1 out of 1,000,000 children. There are, however, very limited studies assessing nutritional status of patients with achalasia before and after treatment. This study focuses

on the nutritional status of children with achalasia before and after treatment.

**Methods:** Children 0–18 years old with confirmed achalasia between January 2016–March 2019 were analyzed for Z-scores of height-for-age (HAZ), weight-for-age (WAZ), body mass index for age (BMIZ) before and after achalasia treatment. WHO growth chart were used as a reference.

**Results:** There were five children with confirmed achalasia referred to our tertiary center. Upon diagnosis, WAZ  $< -1$  was observed in all patients, and similarly BMIZ  $< -1$  in the five patients. HAZ  $< -1$  was observed in all five patients, and two of them even had HAZ  $< -2$ . Four children went to pneumatic dilation, only one children went to surgery due to esophageal diverticulum. After corrective treatment, WAZ and BMIZ significantly improved. HAZ did not show significant improvements in all subjects.

**Table 1**

Comparison of height for age, weight for age, and BMI for age at diagnosis and after therapy

	Case 1		Case 2		Case 3		Case 4		Case 5	
	Before	After	Before	After	Before	After	Before	After	Before	After
Weight for Age	-3	-1	-3,2	1,2	-1,4	2,8	-1,6	2,6	-3	-1
Height for Age	-2,7	-3,3	-1,5	-1,6	-1,1	-1,9	-1	-1,6	-2,9	-2,8
BMI for Age	-5,1	0,1	-3,7	3,1	-1,2	6,7	-1,4	6,1	-4,5	1

All in standard deviation (SD)/Z-score.

**Conclusions:** This study focuses on the nutritional status of children with achalasia before and after treatment. Our data shows that at diagnosis all the children have poor nutritional status. Significant nutritional status improvement occurred in all patients who have received treatment, regardless the type of their treatment. Long-term follow-up might be needed to see improvement in HAZ.

**Disclosure of Interest:** None declared.

### SUN-PO054

#### CASE SERIES OF SEVERE GASTROINTESTINAL DYSMOTILITY IN EHLERS-DANLOS SYNDROME (EDS). DISCUSSION OF NUTRITIONAL MANAGEMENT ROADMAP

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**Rationale:** There is increased recognition of gastrointestinal (GI) problems such as abdominal pain, gastroparesis and intestinal dysmotility in adults with EDS. The literature on EDS and severe GI symptoms is sparse and produces unique diagnostic and management challenges. We present a case series of 11 patients and discuss their characteristics and nutritional management including the challenges and learnings in developing a management algorithm.

**Methods:** Retrospective review of 11 cases from Fiona Stanley and Royal Perth Hospitals over the last 4 years.

**Results:** Six patients had clinical diagnosis of EDS, with a further 5 patients who had characteristics in line with diagnosis included. All 11 patients required nutritional support via tube feeding or intravenous nutrition. Ten patients were female with a mean age of 27 years. Four were diagnosed with Postural Orthostatic Tachycardia Syndrome (POTS), 2 patients had Mast Cell Activation Syndrome (MCAS). Treatment varied; 10 patients required tube feeding, 8 received gastric pacing, to varying effects, while 3 were unable to tolerate any

**Table** (abstract: SUN-P0054):

Characteristic	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11
EDS diagnosis	Yes	No	No	No	No	Yes	No	Yes	No	Yes	Yes
EDS type	hEDS	hEDS	n/a	n/a	n/a	hEDS	n/a	hEDS	n/a	hEDS	hEDS
Age	22	22	34	16	24	29	20	51	26	37	21
Gender	F	F	F	F	F	F	F	F	M	F	F
POTS	Present	Present	Absent	Absent	Present	Present	Absent	Absent	Absent	Absent	Absent
MCAS	Present	Absent	Absent	Absent	Absent	Present	Absent	Absent	Absent	Absent	Absent
Major GI symptoms	Nausea Abdo pain Bloating Constipation	Nausea Abdo pain	Nausea Vomiting Abdo pain Diarrhoea Constipation	Abdo pain Chronic constipation Vomiting	Nausea Abdo pain	Dysphagia Oesophageal regurgitation	Nausea Abdo pain	Vomiting Bloating Nausea	Nausea Vomiting Abdo pain Diarrhoea Constipation	Abdo pain Bloating Nausea	Constipation requiring laparoscopic subtotal colectomy with end ileostomy
GI/T dysmotility	Severe delayed emptying to solids, normal for liquids. Normal small bowel transit with marked diffuse delay in colonic transit	Normal emptying for solids, severe delayed for liquids	Delayed gastric emptying. Nil intestinal dysmotility on emptying studies.	Mild delayed gastric emptying to solids and normal for liquids. Barium swallow showed slow to and fro movement of contrast in D1/2 and slow passage through D3.	Not measured	Oesophageal dysmotility Nil gastric emptying studies – patient refused	Not measured	Oesophageal reflux. No gastric emptying done	Delayed gastric emptying with liquids. No colonic dysmotility	Delayed gastric emptying with solids	Delayed gastric emptying with liquids. Nil intestinal dysmotility
Gastric Pacing	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes	Yes
Tube Feeding	PEG-J	PEG-J	PEG-J	NJ	NJ	NG	NJ	Jej	NJ	No	PEG-J
Parenteral Nutrition	Yes	No	Yes	No	Yes	No	No	No	No	No	No

form of enteral feeding and required home parenteral nutrition. All patients presented with significant loss of weight and weight gain was arduous.

**Conclusions:** GI dysmotility in patients with EDS is not uncommon and likely under-diagnosed, particularly as EDS itself is often under diagnosed. It must be taken into account when treating EDS patients with GI symptoms, especially in the presence of autonomic dysfunction features (including POTS) and failure to maintain weight. There is very little evidence available on the most successful strategies to treat GI dysmotility in EDS and further sharing of information and studies would be beneficial. Subsequently a management algorithm has been developed to trial in this patient cohort.

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#### SUN-PO055

##### THE EFFECT OF MASTIHA SUPPLEMENT IN MICROBIOTA COMPOSITION IN PATIENTS WITH IBD; PRELIMINARY RESULTS

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**Rationale:** The purpose of this study was to explore the effect of mastiha supplement, rich in bioactive nutraceuticals, in microbiota of patients with active Crohn's disease (CD) and ulcerative colitis (UC).

**Methods:** We employed 16S rRNA sequencing to investigate the composition of faecal microbiota in stool samples derived from 27 participants in a randomised, placebo-controlled clinical trial (Clinicaltrials.gov ID: NCT02796339).

**Results:** Relative abundances of Bifidobacteriales ( $p=0.01$ ), Corynebacteriales ( $p=0.002$ ), and Coriobacteriales ( $p=0.02$ ) were higher in UC, while Bacteroidales ( $p=0.02$ ), Desulfovibrionales ( $p=0.05$ ) and Enterobacteriales ( $p=0.006$ ) were higher in CD. In CD treated with mastiha, relative abundance of Tyzzerella (Lachnospiraceae) decreased ( $p=0.05$ ). Also, in CD patients relative abundance of Terrisporobacter (Peptostreptococcaceae) was higher ( $p=0.04$ ), while Saccharimonadaceae was lower in mastiha vs placebo at follow up ( $p=0.02$ ). In UC, relative abundance of Alistipes (Rikenellaceae) ( $p=0.03$ ), Streptococcus (Streptococcaceae) ( $p=0.04$ ), Anaerostipes (Lachnospiraceae) ( $p=0.04$ ), Papillibacter (Ruminococcaceae) ( $p=0.03$ ) and Lachnospiraceae ( $p=0.04$ ) were lower in mastiha vs placebo at follow up. Also, relative abundances of Clostridiales vadin BB60 group ( $p=0.05$ ), Eubacterium coprostanoligenes group (Ruminococcaceae) ( $p=0.05$ ) and Lachnospiraceae CHKCI001 ( $p=0.02$ ) decreased in UC treated with mastiha. Our results showed no significant differences in diversity or global microbiota composition.

**Conclusions:** Although no significant differences in diversity were reported however some differences in relative abundances of bacterial taxa were observed.

**Disclosure of Interest:** None declared.

#### SUN-PO056

##### EFFECT OF DIRECT-ACTING ANTIVIRALS ON SERUM LIPID PROFILES AND BODY COMPOSITION OF CHRONIC HEPATITIS C PATIENTS: A RETROSPECTIVE STUDY

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**Rationale:** Sustained virologic response (SVR) improves anorexia and general fatigue in chronic hepatitis C. However, nonalcoholic fatty liver disease (NAFLD) may occur because of excessive energy intake and lack of exercise in some patients. We conducted a retrospective study on changes in serum lipid profiles and body composition before and after treatment in chronic hepatitis C patients achieving SVR with direct-acting antivirals (DAAs).

**Methods:** From 121 chronic hepatitis C patients achieving SVR with DAAs in our hospital from December 2015 to October 2018, we enrolled 23 cases whose serum lipid and body composition data were obtained before and after treatment. Serum lipid profiles (total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), triglycerides (TGs)) and body composition data from bioelectrical impedance analysis using InBodyS10™ were collected before and 24 weeks after DAA treatment. We compared following parameters from body composition data: body mass index (BMI), skeletal mass index (SMI), body fat percentage (BFP), extracellular water/total body water (ECW/TBW) ratio, phase angle (PA), body cell mass (BCM) before and after DAA treatment. Changes in hepatic fibrosis markers were compared before and after DAA treatment using fibrosis-4 (FIB4) and serum mac-2-binding protein glycosylation isomer (M2BPGi).

**Results:** The mean age of patients was  $63.9 \pm 13.6$  (1SD) years; eight were men. Mean values of data before and after DAA treatment were : TC ( $183 \pm 43 \rightarrow 209 \pm 45$  mg/dL,  $p < 0.0001$ ), LDL-C ( $109 \pm 35 \rightarrow 129 \pm 39$  mg/dL,  $p < 0.0001$ ), HDL-C ( $57 \pm 16 \rightarrow 62 \pm 19$  mg/dL,  $p < 0.0001$ ), TG ( $114 \pm 40 \rightarrow 116 \pm 52$  mg/dL,  $p = 0.003$ ), BMI ( $23.5 \pm 2.3 \rightarrow 23.6 \pm 2.3$  kg/m<sup>2</sup>,  $p = 0.543$ ), SMI ( $6.52 \pm 0.94 \rightarrow 6.49 \pm 0.88$  kg/m<sup>2</sup>,  $p = 0.605$ ), BFP ( $32.5 \pm 6.6 \rightarrow 32.7 \pm 6.7\%$ ,  $p = 0.852$ ), ECW/TBW ratio ( $0.392 \pm 0.086 \rightarrow 0.386 \pm 0.023$ ,  $p = 0.179$ ), PA ( $5.16 \pm 0.83 \rightarrow 5.15 \pm 0.85$ ,  $p = 0.785$ ), BCM ( $25.8 \pm 4.7 \rightarrow 26.0 \pm 4.5$  kg,  $p = 0.582$ ), FIB4 ( $2.43 \pm 1.40 \rightarrow 1.89 \pm 0.73$ ,  $p < 0.0001$ ), M2BPGi ( $1.68 \pm 1.29 \rightarrow 0.92 \pm 0.45$  COI,  $p = 0.002$ ).

**Conclusions:** DAA treatment significantly increased liver fibrosis markers and affected lipid metabolism. There were no significant changes in the patient's body composition before and after DAA treatment as it was a short-term observational study. However, life-style-related diseases may cause changes in body composition in the long term, increasing the chances of NAFLD. Hence, a careful follow-up is needed.

**Disclosure of Interest:** None declared.

#### SUN-PO057

##### ADHERENCE TO MEDITERRANEAN DIET IN CROHN'S DISEASE

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**Rationale:** We aimed at assessing the adherence to Mediterranean diet (MD) in patients with Crohn's disease (CD).

**Methods:** Outpatients with CD were enrolled in the protocol. Medical history, disease activity, Inflammatory Bowel Disease Questionnaire (IBDQ), habitual Mediterranean Diet (MedDiet) score, dietary intake and anthropometric characteristics were assessed. Biochemical and inflammatory indices were quantified in blood.

**Results:** A total of 86 patients with CD participated in the protocol [41 in relapse ( $5 \leq$  Harvey Bradshaw Index  $\leq 14$ ) and 45 in remission (Harvey Bradshaw Index  $\leq 4$ ). Patients with inactive disease adhered more to MD. Regression models were developed to analyze the relationship between MedDiet score and CRP or HBI or IBDQ adjusted for age, sex, BMI and smoking (model 1) or for sex, age, BMI, smoking, disease duration and use of anti-inflammatory agents (model 2) as covariates. After adjustment for age, sex, BMI and smoking (model 1), HBI showed a highly significant negative linear association with the MedDiet score ( $p < 0.001$ ) and IBDQ showed a positive linear association with MedDiet score ( $p = 0.008$ ). These associations remained significant even when disease duration and anti-inflammatory medication entered the model (model 2).

**Conclusions:** Adherence to MD is associated with improved quality of life in CD patients. Higher adherence to MD could be of importance in patients with CD to improve quality of life and reduce disease activity.

**Disclosure of Interest:** None declared.

#### SUN-PO058

##### NUTRITIONAL MODULATION OF POSTPRANDIAL FGF19 PLASMA LEVELS IN HUMANS

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**Rationale:** Fibroblast growth factor 19 (FGF19) inhibits bile acid synthesis and improves energy metabolism. Therefore, FGF19 gained interest in metabolic research, but the exact role of FGF19 in postprandial nutrient metabolism remains enigmatic. We investigated the plasma FGF19 levels in response to different mixed meal test (MMT) models in healthy lean subjects in a metabolic-endocrine framework including glucose, insulin, glucagon-like peptide 1 and bile acids (BAs).

**Methods:** We assessed inter- and intra-individual variability of postprandial FGF19 excursion (Nutridrink, Nutricia). Additionally, we investigated the responses to short-term starvation and eucaloric reduced meal frequency as physiological interventions. Hereafter we examined enteral tube vs. intravenous feeding (Periolimel, Baxter). Finally, we assessed FGF19 responses to a single dose (10 mg/kg) of glycine-conjugated deoxycholic acid (gDCA) during a MMT.

**Results:** The postprandial FGF19 course showed high inter- and intra-individual variability. Short-term starvation increased fasted FGF19 levels (0.10 [0.07] vs. 0.22 [0.40] ng/mL, after 14 and 40 hrs fasting resp.;  $P < 0.05$ ) and postprandial FGF19 levels (58.6 [44.3] ng/ml  $\times$  min vs. 123.8 [124.1] ng/ml  $\times$  min;  $P < 0.05$ ). A reduced meal frequency (one vs. three meals per day) had no effect on postprandial FGF19 responses.

Postprandial FGF19 levels after an intravenous MMT were much lower (42.3 [31.0] ng/ml  $\times$  min), but tube feeding increased the postprandial FGF19 response (152.6 [98.8] ng/ml  $\times$  min). Finally, gDCA supplementation did not affect FGF19 levels, but augmented GLP-1 release.

**Conclusions:** Postprandial FGF19 levels vary considerably and might be theoretically driven by intestinal BAs flux. Paradoxically, both starvation and enteral tube feeding increase FGF19 levels which may also be explained by intestinal BAs, or in the case of tube feeding, components of Periolimel. Apparently, eucaloric meal reduction does not modulate FGF19 during the meal itself despite effects on daily glucose levels. Lack of FGF19 elevation following intravenous nutrition supports the importance of enterohepatic cycling of BAs as trigger for intestinal FGF19 production. gDCA may have intrinsically low FGF19 secreting potential, possibly due to its conjugated status. Postprandial FGF19 secretion is modifiable to specific stimuli that need to be elucidated.

**Disclosure of Interest:** None declared.

#### SUN-PO059

##### CONSUMPTION OF LOW PROTEIN DIET IN COMBINATION WITH INDOMETHACIN INDUCED GROWTH FAILURE AND GUT BARRIER DYSFUNCTION IN MICE

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**Rationale:** Severe acute malnutrition (SAM) is often associated with an environmental enteropathy (EE). As mechanisms leading to growth failure in EE included increased intestinal permeability and gut inflammation, we aimed to develop a novel murine SAM model with these features.

**Methods:** Sixty C57BL/6 mice were fed with low protein (LP-5% protein) or control diet for 3 weeks. From D14 to D21, mice daily received Indomethacin (1 or 2.5 mg.kg<sup>-1</sup>) to induce enteropathy. Body weight and linear growth were recorded. Gut barrier function (intestinal permeability, jejunal tight junction proteins (occludin, claudin-2) and inflammation (fecal calprotectin, TNF $\alpha$ , MCP-1)) were assessed. Data were compared by 2-way ANOVA (LP-indomethacin) and statistical difference between two treatment groups was calculated by using t-test or Mann-Whitney.

**Results:** LP diet or indomethacin treatment led to significant decreases in body weight, linear growth, occludin mRNA levels while LP diet or indomethacin treatment increased MCP-1 mRNA levels ( $P < 0.05$  for all). Combination of indomethacin at 2.5 mg.kg<sup>-1</sup> and LP diet led to a (i) decreased body weight ( $P < 0.0001$ ), (ii) decreased linear growth ( $P < 0.0001$ ), (iii) increased gut inflammation (increased fecal calprotectin level ( $P = 0.0012$ ); increased jejunal MCP-1 mRNA levels ( $P = 0.02$ ), (iv) intestinal hyperpermeability ( $P = 0.0627$  vs CT,  $P = 0.0448$  vs LP), (v) decreased jejunal claudin-2 mRNA levels ( $P < 0.05$ ).

**Conclusions:** This murine model exhibits (i) wasting, (ii) stunting and (iii) enteropathy such as an increased intestinal permeability and gut inflammation. This model may contribute to a better understanding of the mechanisms behind the role of environmental enteropathy in stunting.

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### SUN-PO060 EVALUATION OF BODY COMPOSITION IN PATIENTS WITH CROHN'S DISEASE TREATED WITH INFlixIMAB: PRELIMINARY RESULTS

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**Rationale:** Crohn's disease (CD) impairs nutritional status, however the process of nutritional transition with increasing prevalence of obesity is a worldwide reality. Very likely to affects this patients. The aim of this study was to identify the body composition of patients with Crohn's disease (CD) using Infliximab (IFX).

**Methods:** This is a preliminary, cross-sectional study conducted in a tertiary hospital on patients with CD in remission phase treated with IFX. The body composition was evaluated using anthropometric measurements: waist circumference (WC), weight and height to calculate the Body Mass Index (BMI). Fat mass was assessed by means of bioimpedance, compared to the reference proposed by Lohman. Statistical analyses were performed using SPSS<sup>®</sup> software. The t-test was used to compare groups. The values of  $p \leq 0.05$  indicate statistical significance.

**Results:** Fourteen patients were evaluated: 8 women, age  $39.3 \pm 12.4$  years, diagnosed with CD for  $14 \pm 6.6$  years and IFX for  $4.7 \pm 3.1$  years. The BMI was  $24 (19.2-29.7) \text{ kg/m}^2$  for the whole group, while  $25.2 \pm 3.4$  vs  $23.2 \pm 3.5 \text{ kg/m}^2$  ( $p=0.293$ ) for males and female respectively. WC:  $81.9 \pm 12.6$  cm. A high percentage of body fat was observed, with  $32.3 \pm 6.9\%$  for women and  $26.5 \pm 5.2\%$  for men ( $p=0.111$ ).

**Conclusions:** Preliminary results indicate the risk of overweight and high percentage of fat in the sample studied is higher in relation to the risk of malnutrition, indicating that nutritional transition process seems also affects these patients.

#### Reference

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**Disclosure of Interest:** None declared.

### SUN-PO061 EVALUATION OF CARNITINE FRACTION DURING LONG-TERM LATE EVENING SNACK ADMINISTRATION IN CIRRHOTIC PATIENTS

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**Rationale:** Our previous study suggested that Fischer ratio at fasting in the next morning was improved by administering LES with BCAA in patients with Cirrhosis. Carnitine is used to improve metabolic disorder in cirrhotic patients. However, there are few

reports on carnitine fraction. Therefore, we evaluated serum carnitine fraction during long-term LES with BCAA in patients with liver cirrhosis.

**Methods:** Ten outpatients with cirrhosis were enrolled in this study. They were outpatients without LES. The patient's characteristics were age,  $73.1 \pm 8.9$  years; Male/Female, 5/5; and BMI,  $23.3 \pm 2.4 \text{ kg/m}^2$ . The etiology was eight HCV and two alcoholics. Five protocols were tested: (i) no LES (control); (ii) branched-chain amino acid enriched enteral nutrition (LES) containing 6.1 g branched-chain amino acid as LES each day; (iii) branched-chain amino acid enriched granule product containing 4 g branched-chain amino acid twice a day, and branched-chain amino acid enriched EN containing 14.1 g branched-chain amino acid taken throughout each day until dinner (GP without LES); and (iv) branched-chain amino acid enriched granule product containing 4 g branched-chain amino acids twice a day, and branched-chain amino acid enriched EN containing 14.1 g branched-chain amino acid taken as LES each day (GP with LES 1M); and (v) After GP with LES-1M this protocol continued for 3 months more. (GP with LES 3M) After each protocol (i)-(iv) had been used for 1 month and for 3 months (v), we measured serum carnitine fraction.

**Results:** Short chain carnitine tended to be higher especially in C3, C4 and C5 than the Japanese average in all periods. Medium-chain carnitines were in the usual range. Long-chain fatty acids tended to be low especially in C16, C18, C18: 1, however C12, C14: 1 and C18: 1-OH tended to be high. C 0 free carnitine tended to be low. Beta oxidation tended to increase in the period of LES, however no significant differences were observed.

**Conclusions:** In patients with liver cirrhosis, changes in blood amino acid concentrations were observed by administration of BCAA-containing LES, but no change in serum carnitine fraction was found.

**Disclosure of Interest:** None declared.

### SUN-PO062 CHANGES IN BLOOD AMINO ACID CONCENTRATIONS SPECIFIC TO THE PERIOPERATIVE PERIOD OF HEPATIC RESECTION

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**Rationale:** Hepatic resection is a curative treatment for patients with liver cancer. Because the liver plays a central role in nutrient metabolism in the body, it is essential to determine patients' disease conditions and perform nutritional management during the perioperative period to reduce post-hepatic resection risks. We have previously reported that patients exhibit malnutrition following hepatic resection compared with those before the surgery; however, there are only a few reports on the changes in amino acid metabolism in the body during the perioperative period of hepatic resection. Therefore, the present study compared the changes in blood amino acid concentrations during the perioperative period of liver, stomach, and colon cancer resections to clarify whether the changes in amino acid metabolism following hepatic resection are reactions specific to hepatic resection.

**Methods:** Overall, 37 patients who had undergone resection—13 in the hepatic resection group, 14 in the gastrectomy group, and 10 in the colectomy group—were included. Fasting blood samples were collected the morning of the day of surgery (pre), postoperative day 3 (PO3), and postoperative day 7 (PO7), and blood tests were performed. In addition, amino acid concentrations were measured using plasma, whereas insulin (IRI), acylcarnitine concentrations were measured using serum.

**Results:** In the hepatic resection group, isoleucine (Ile) and leucine (Leu), which are branched-chain amino acids (BCAAs), were significantly lower than those in the colectomy group on POD3. Moreover, in the hepatic resection group, the aromatic amino acid (AAA) phenylalanine (Phe) significantly increased on POD3 and POD7 compared with the pre concentrations, whereas tyrosine (Tyr) was significantly higher than that in the gastrectomy and colectomy groups on POD3. Fischer's ratio (BCAA/AAA) of the hepatic resection group significantly decreased on POD3 and POD7 compared with the pre concentrations and was significantly lower than that of the gastrectomy and colectomy groups on POD3 and POD7. Propionyl carnitine (C3), the catabolic intermediate of valine (Val) and Ile, showed no temporal and intergroup differences. In the hepatic resection and colectomy groups, isovaleryl carnitine (C5), the catabolic intermediate of Ile and Leu, significantly decreased on POD7 compared with that on POD3 and C5 in the gastrectomy group significantly increased on POD3 compared with the pre concentration.

**Conclusions:** Postoperative Fisher ratio in the hepatic resection group, suggesting a possible increase in the need for BCAA. Therefore, BCAA administration as a late evening snack (LES) from the early postoperative period in patients who have undergone hepatic resection was considered desirable.

**Disclosure of Interest:** None declared.

#### SUN-PO063

##### CONSUMPTION OF HIGH ENERGY PHOSPHATE AND EFFECTS OF NUTRITIONAL THERAPY ON LIVER REGENERATION AFTER PATIAL HEPATECTOMY

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**Rationale:** Energy charge in mitochondria decreased markedly after partial hepatectomy (PH). This study evaluates the variations of high energy phosphate, both adenosine triphosphate (ATP), creatine phosphate (CP); and the effects of nutritional therapy on liver regeneration (LR) after PH.

**Methods:** Male Wistar rats weighed around 200 g were used. A 67% PH was performed on control (C), high glucose (HG), high fat (HF), high balanced amino acid (HA), and high branched-chain amino acid (HB) groups rats. The intravenously (iv) nutrition solution given 2 days prior to PH. All rats were killed at 6, 24, 48, 72 h after PH. ATP, CP, were measured. Remnant liver weight/body weight (RLW/BW) ratio, DNA synthetic rate, DNA content, and Mitotic index (MI) were chosen as indicators of LR.

**Results:** ATP and CP in remnant liver decreased sharply after PH. DNA synthetic rate was significantly higher in HG, HB than HF, HA, and C groups rats 24 h after PH. RLW/BW ratio and DNA content were significantly higher in HG, HB than HF, HA, and C groups rats 72 h after PH. MI was higher in HG, HB than HF, HA, C groups rats 48 h after PH.

**Table 1**

Variations of ATP, CP, and DNA Synthetic Rate during LR after PH

Item\Time	Before (C)	6 h	24 h	48 h	72 h
ATP (mmole/kg dw)	27.1 ± 3.2	12.6 ± 2.2 <sup>#</sup>	15.2 ± 1.9 <sup>#</sup>	19.8 ± 2.7 <sup>#</sup>	25.6 ± 3.0
CP (mmole/kg dw)	14.2 ± 2.2	3.8 ± 0.8 <sup>#</sup>	7.2 ± 1.0 <sup>#</sup>	8.8 ± 1.1 <sup>#</sup>	13.4 ± 2.0
DNA Synthetic Rate (DPM/ug DNA) <sup>§</sup>					
HG	0	r	80.1 ± 8.1*	18.2 ± 2.2	r
HF	0	r	48.3 ± 5.0 <sup>#</sup>	10.5 ± 1.7	r
HA	0	r	56.2 ± 7.1	12.4 ± 1.8	r
HB	0	r	78.8 ± 8.0*	18.0 ± 2.4	r
C	0	r	64.1 ± 6.4	12.3 ± 1.8	r

<sup>§</sup>[<sup>3</sup>H]-Thymidine incorporation;

\*higher than C, p < 0.05;

<sup>#</sup>lower than C, p < 0.05; r: rare.

**Conclusions:** Energy substrate in remnant liver including ATP, CP decreased immediately after PH. Nutritional therapy by high glucose and high BCAA (but not high fat, high balanced amino acid) iv solution can increase the LR after PH.

**Disclosure of Interest:** None declared.

#### SUN-PO064

##### EFFECT OF APRAGLUTIDE, A GLUCAGON-LIKE PEPTIDE-2 ANALOG, ON PATIENTS WITH SHORT BOWEL SYNDROME: PRELIMINARY RESULTS FROM AN OPEN-LABEL STUDY

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**Rationale:** Treatment with glucagon-like peptide (GLP)-2 and its analogs have been shown to improve intestinal function in patients with short bowel syndrome (SBS). This study investigates the safety and efficacy of weekly dosing of apraglutide, a novel long-acting GLP-2 analog, in development for the treatment of SBS.

**Methods:** A total of 8 patients will be enrolled in an open-label phase II trial with a 5 mg once-weekly subcutaneous injection of apraglutide for 4 weeks. Main inclusion criteria include an average fecal output ≥1500 g/day and a urine volume <2000 ml/day. We present preliminary results from 3 patients. Safety was the primary endpoint. As secondary endpoints, we examined changes from baseline in stoma wet weight output and intestinal absorption of wet weight and energy measured by metabolic balance studies.

**Results:** Common adverse events (AEs) were peripheral edema, polyuria and stoma nipple enlargement. AEs were transient with a mild to moderate severity. No safety concerns were observed with laboratory values, vital signs or ECGs. We observed a decrease in stoma wet weight output and an increase in intestinal absorption of wet weight and energy (Table 1). Initial pharmacokinetic analysis supports once-weekly dosing.

**Table 1**

Results from 3-day metabolic balance studies: Change from baseline after 4 weeks of apraglutide treatment. SBL = short bowel length.

3-day average	63-year old female with jejunostomy SBL = 150 cm	61-year old male with jejunostomy SBL = 140 cm	65-year old female with jejunostomy SBL = 230 cm
Stoma wet weight output, g/day (%)	-1533 (-28%)	-1632 (-33%)	-280 (-15%)
Wet weight absorption, g/day (%)	1607 (+98%)	1732 (+83%)	95 (+4%)
Energy absorption, kJ/day (%)	2164 (+34%)	3038 (+37%)	388 (+5%)



**Conclusions:** Preliminary results from this open-label phase II study showed that weekly dosing of apraglutide was safe and well tolerated and improved intestinal absorption in patients with SBS.

**Disclosure of Interest:** None declared.

#### SUN-PO065

##### GENETIC CONDITIONS IN THE ALTERATION OF LIVER FUNCTION TESTS IN ADULT HOSPITALIZED PATIENTS TREATED WITH PARENTERAL NUTRITION WITH LIPIDS OF VEGETAL ORIGIN

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**Rationale:** Lipid emulsions (LE) phytosterols (PS) are relevant in liver function test (LFT) alterations. Higher phytosterolemia for T carriers of rs41360247 from ABCG5 and C of rs4245791 from ABCG8 have been demonstrated. Objective: determine if LFT alterations in adult hospitalized patients were associated with phytosterolemia and these polymorphisms.

**Methods:** The population included in the *EudraCT N°: 2014-003597-17 clinical trial*. Patients received at least 7 days of 0.8 g lipid/Kg/day of olive/soybean LE followed by 7 days of 0.4 g/kg/day olive/soybean or 100% fish oil (omega-3 fatty acids, PS-free). Multivariate analysis was made to study LFT variations and PS association, and its fractions, as well as polymorphisms and their interactions (PS\*SNP). The stepwise linear regression model uses the inclusion criteria of  $p < 0.2$ .

**Results:** 19 patients, 73.7% male, the median age of 68 years (IQR, 16) and weight 76 kg (IQR, 8.7). 73.7% of the patients had the rs41360247-TT genotype and 52.6% rs4245791-TT genotype.

	GGT variation B [95% CI]	AP variation B [95% CI]	ALT variation B [95% CI]
Betasitosterol rs41360247	0.473 [0.074–0.873]	0.278 [–0.092 to 0.648] <b>0.533 [0.161–0.905]</b>	0.737 [0.171–1.302]
Lanosterol rs41360247 rs4245791*	0.266 [0.115–0.417]	0.150 [–0.003 to 0.304] 0.531 [0.176–0.886]	– – <b>0.206 [0.006–0.346]</b>
InLanosterol	–	0.589 [0.214 to 0.964]	–
Stigmasterol rs41360247 rs41360247* InStigmasterol rs4245791*	0.151 [0.050–0.252]	– 0.082 [–0.020 to 0.184]	– <b>0.210 [0.060–0.361]</b>
InStigmasterol	–	–	–

CI: confidence interval; GGT: Gamma-glutamyl transferase; AP: Alkaline phosphatase; ALT: Alanine aminotransferase; Bold indicates significance.

**Conclusions:** rs41360247 and rs4245791 genotype could influence in some LFT alteration associated with PS in adult patients with short PN. Studies in larger series are needed to determine the conditions in which polymorphisms act.

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#### SUN-PO066

##### COMPARISON OF THE DEFINITION OF SARCOPENIA ON CIRRHOTIC PATIENTS REGARDING THE EUROPEAN CONSENSUS VALUES 2010 AND 2019

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**Rationale:** In 2010, the European Working group on Sarcopenia in Older People published a practical clinical definition and consensus diagnostic criteria to identify sarcopenia. In 2019, a revised consensus with modified criteria was published. We aimed to compare the two definitions in a cohort of patients with liver cirrhosis. (1,2)

**Methods:** Over a period of 2 years, 99 cirrhotic patients were prospectively studied. Sarcopenia was determined by muscle strength, assessed by hand grip strength, muscle mass estimated by L3 psoas muscle area from CT/MRI scans and muscle performance assessed by gait speed. Furthermore, midarm muscle circumferences (MAMC) was measured. Patients were divided into 3 groups: non-sarcopenia, pre-sarcopenia and sarcopenia using both 2010 and 2019 definitions.

**Results:** Based on the 2010 definition, 35/99 patient had no sarcopenia, 29/99 were defined as pre-sarcopenia and in 35/99 sarcopenia were diagnosed. With the 2019 definition, significantly more patients were diagnosed as non-sarcopenic (88/99), whereas only 4/99 were diagnosed as pre-sarcopenic and 15/99 as sarcopenic ( $p < 0.0001$ ). With the 2010 definition, significantly more men were diagnosed as pre-sarcopenic ( $p = 0.008$ ) and BMI was significantly higher in the non-sarcopenic group compared to the pre-sarcopenic and sarcopenic group, whereas with the 2019 definition no differences in gender and BMI were found between the groups. Liver function did not differ between the groups when applying either definition. MAMC decreased significantly with increasing degree of sarcopenia in the 2010 definition ( $p < 0.0001$ ), but there was no difference between non-sarcopenia and pre-sarcopenia using the 2019 definition.

**Conclusions:** Using the 2019 definition, it appears that pre-sarcopenia is underestimated in liver cirrhosis. Possible reasons could be different starting points (2010 muscle strength, 2019 muscle mass) and cut-off values (muscle strength) of the diagnose process. To evaluate, whether the 2010 or 2019 diagnose criteria are valid for diagnosing sarcopenia in liver cirrhosis patients, further outcome data needs to be compared.

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#### SUN-PO067

##### PREVALENCE OF MALNUTRITION BY GLIM CRITERIA AND OF SARCOPENIA BY THE NEW DEFINITION AND THEIR ASSOCIATIONS WITH 1-YEAR SURVIVAL IN CIRRHOTIC PATIENTS

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**Rationale:** In 2018, the Global Leadership Initiative on Malnutrition (GLIM) developed diagnostic criteria for malnutrition and the European Working Group on Sarcopenia in Older People revised the criteria of sarcopenia diagnosis. We applied both new criteria in a sample of cirrhotics to explore the prevalence of these conditions, as well as potential associations with 1-year survival.

**Methods:** 197 cirrhotics of various etiologies and disease stages (50.8% compensated cirrhosis, 58.9% males, age  $60 \pm 10.8$  years) were enrolled. For the assessment according to the GLIM criteria, non-volitional weight loss during the past year was recorded and Body Mass Index was computed based on dry weight. Muscle mass was assessed with DEXA and expressed with the Appendicular Skeletal Mass Index, and muscle strength with handgrip strength. For 109 patients, data on 1-year survival were also available.

**Results:** According to the GLIM criteria, 22.3% ( $n = 44$ ) of the patients were classified as malnourished. According to the sarcopenia definition, 4.6% ( $n = 9$ ) of the patients were classified as sarcopenic, among which only 1 patient was sarcopenic obese (0.5%). There were no statistically significant differences regarding malnutrition and sarcopenia prevalence between the subgroup of patients with survival data and the whole study sample. After adjusting for age, sex, disease etiology and decompensation, malnutrition was significantly associated with 83% lower odds of survival (OR = 0.17, 95% CI 0.05–0.67,  $p = 0.011$ ), whereas sarcopenia was marginally associated with 75.6% lower odds of survival (OR = 0.224, 95% CI 0.05–1.24,  $p = 0.089$ ).

**Conclusions:** In cirrhotics of different etiologies, malnutrition as assessed by the GLIM criteria is more prevalent, compared to sarcopenia, and is associated with reduced likelihood of 1-year survival.

**Disclosure of Interest:** None declared.

#### SUN-PO068

##### THE FUNCTION OF ARACHIDONIC ACID (AA) IN CHRONIC CONSTIPATION DURING SYNBIOTICS TREATMENT

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**Rationale:** Clinical trial was performed to identify the changes in gut microbial and metabolic composition during the treatment with synbiotics in patients with functional constipation and then animal experiment was done to verify the function of characteristic metabolin.

#### Methods:

1. The clinical trial included 53 patients diagnosed with chronic functional constipation and 53 healthy community volunteers, all constipated patients received synbiotics treatment for 1 month. Fecal samples were collected from all participants and analyzed by 16S-rRNA sequencing metagenome analysis and targeted metabolomics analysis. In addition, patients should received the questionnaire survey (Bristol Stool Chart, Wexner scale).
2. 40 adult C57BL/6 female mice (8 weeks of age) were treated with antibiotics and received the FMT (fecal microbiota transplantation) with the faeces from the healthy (H) and constipated individuals (C) for 8 weeks, and then C group were divided into 3 groups, one group were received the arachidonic acid treatment

for 4 weeks. In the end, whole gut transport test were performed, intestinal and brain tissue, gut faeces were collected from the mice.

#### Results:

1. Clinical effects The defecation frequency per-week was increased after synbiotics treatment ( $1.98 \pm 0.15$  vs.  $7.08 \pm 0.36$   $p < 0.001$ ), but it had no improvement in fecal consistency and reducing toilet time ( $p > 0.05$ ).
2. Microbial improvement: genus of *Prevotella\_9* was the characteristic bacteria that riched in healthy individuals but decreased in the constipation group and increased in the treatment group, [5.66%(H) vs. 1.20% (C) vs. 3.23%(T),  $P = 0.69$ ,  $FDR = 0.82$ ], while *Escherichia-Shigella* was riched in the constipation group and decreased in the treatment group [(3.66%(H) vs. 5.06%(C) vs. 0.22%(T)  $P < 0.001$ ,  $FDR = 0.004$ ].
3. The abundance of arachidonic acid was lower in constipation group ( $p = 0.04$ ) and increased after synbiotics treatment ( $p = 0.03$ ) in the clinical trial. In the mice experiment, whole gut transit time were longer in C group after FMT in 8 weeks ( $75.0 \pm 9.2$  vs  $150.2 \pm 32.2$  min,  $p = 0.032$ ) and arachidonic acid treatment can decreased the whole gut transit time ( $150.2 \pm 32.2$  vs  $87.2 \pm 6.7$  min,  $p = 0.041$ ) and increased the 5-HT abundance ( $p = 0.024$ ) in intestinal tissue (ELISA test)

**Conclusions:** Synbiotic treatment can achieve clinical remission in defecation frequency, and improve the microbiota and metabolic environment in constipated patients. the supplement of arachidonic acid may be a great way in the treatment of constipation.

**Disclosure of Interest:** None declared.

## Nutrition and cancer I

#### SUN-PO069

##### A CROSS-SECTIONAL STUDY OF FACTORS ASSOCIATED WITH ACTIVITIES OF DAILY LIVING IN DIGESTIVE CANCER INPATIENTS

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**Rationale:** The mortality in digestive cancer patient decreased, according to annual statistics reporting from national survey of Japan, due to advances in early detection and treatment. With increased digestive cancer survivor, the quality of life and activities of daily living (ADL) has become a priority issue. The purpose of this study is to examine the factors associated with ADL at discharge in digestive cancer patients.

**Methods:** In total, 221 patients who underwent surgery due to digestive cancer between 2015 and 2017 were analyzed. All patients were measured with modified controlling nutritional status (CONUT) score at admission and Barthel Index (BI) at admission and discharge as an ADL index. We examined the relationship between BI at discharge and characteristics, nutritional index, antibiotic use period, and hospitalization period. Multiple regression analysis was performed.

**Results:** Multiple regression analysis showed that modified CONUT score ( $r = -0.73$ ,  $p < 0.01$ ), age ( $r = 0.58$ ,  $p < 0.01$ ), BI at admission ( $r = -0.28$ ,  $p < 0.01$ ), and antibiotic use period ( $r = 0.41$ ,  $p < 0.05$ ) were independent contributors to BI at discharge.

**Conclusions:** Malnutrition, increased age, low ADL at admission, and infection were associated with low ADL at discharge in digestive cancer patients. Based on these findings, improvement of nutrition

status before admission and infection control after surgery could lead to better ADL.

**Disclosure of Interest:** None declared.

#### SUN-PO070

### DO PATIENTS UNDERGOING INTESTINAL CANCER SURGERY BENEFIT FROM AN APPROPRIATE NUTRITIONAL REGIMEN IN TERMS OF LESSENING OF POSTOPERATIVE LEAN MASS LOSS?

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**Rationale:** Research has shown that cancer patients undergoing surgical treatment suffer from chronic low-grade inflammation and are therefore at risk of malnutrition. To counteract this, individually adapted nutritional support is used. The purpose of this study was to evaluate the relationship between the level of chronic inflammation before surgery and during the perioperative period, and the development of loss of lean mass 1 month after operation in patients with an early start of nutritional support.

**Methods:** Between november 2018 and april 2019, we enrolled 62 cancer patients who underwent intestinal surgery at the Institute of Oncology Ljubljana, Slovenia.

As a marker for preoperative chronic inflammation, absolute CRP values were used. As an estimate of the inflammatory state during the entire perioperative period, the mean between preoperative and postoperative absolute CRP values was used. Relative change in the FFMI was used to evaluate the progress of lean mass loss.

FFMI was measured using bioelectrical impedance analysis shortly before the procedure, and 1 month after the procedure, while CRP values were concurrently obtained.

Patients at nutritional risk received preoperative and postoperative nutritional care, provided by a nutritional support team as part of routine clinical practice.

**Results:** Between preoperative CRP values (stdev = 22.795, shapiro-wilk  $p$ -value =  $9.359 \times 10^{-12}$ , 79.032% of values in lowest 1/6 of observed range) and the relative change in FFMI (stdev = 0.0719), we observed a Pearson correlation of 0.359 ( $p$ -value = 0.004).

Between mean perioperative CRP values (stdev = 26.357, shapiro-wilk  $p$ -value =  $3.134 \times 10^{-11}$ , 77.419% of values in lowest 1/6 of observed range) and the relative change in FFMI, we observed a Pearson correlation of 0.393 ( $p$ -value = 0.002).

**Conclusions:** The data shows that patients with low inflammatory states, both preoperatively and in the entire perioperative period, show some degree of lean mass loss, as is already known, in spite of an individually planned nutritional regimen.

Interestingly, in patients with higher inflammatory states, the degree of lean mass loss seems to be lower. This may be due to malnourished patients in a higher catabolic state receiving more intensive nutritional support. It may also simply be the result of a considerably lower sample size in this patient group.

**Disclosure of Interest:** None declared.

#### SUN-PO071

### EFFECTS OF ORAL DHA SUPPLEMENTATION IN MODULATING SERUM EPOXYDOCOSAPENTAENOIC ACID LEVELS IN BREAST CANCER PATIENTS

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**Rationale:** The omega-3 polyunsaturated fatty acids, as docosahexaenoic acid (DHA), are considered mediators for resolution of inflammation during cancer and possibly associated with better outcomes. Metabolites of the DHA, as the epoxydocosapentaenoic acids (EDPs), are hypothesized to be responsible for some of DHA beneficial effects. We aimed to assess the circulating 19,20-EDP levels in breast cancer (BC) patients and in healthy controls before and after oral DHA supplementation and the potential differences in the DHA conversion in 19,20-EDPs between patients with different BC presentations.

**Methods:** BC patients and healthy controls were supplemented with DHA in form of algal oil for 10 days (2 g/day). Blood samples were collected at baseline (T0) and after supplementation (T1) to assess 19,20-EDP serum levels by liquid chromatography spectrometry.

**Results:** 33 BC patients and 10 healthy controls were studied. EDP values at T0 were not different between patients and controls. At T1, we found an increase in 19,20-EDP levels in BC patients ( $P < 0.00001$ ) and in controls ( $P < 0.001$ ), whereas no differences in 19,20-EDPs were present between the two groups; when considering the type of BC presentation, patients with BRCA1/2 mutation showed lower 19,20-EDPs levels with respect to BC patients without the mutation ( $P = 0.03$ ). According to immunohistochemical subtype, luminal A-like BC patients showed at T1 higher 19,20-EDP levels compared to non-luminal A ( $P = 0.02$ ).

**Conclusions:** Oral DHA supplementation was associated with increased 19,20-EDP serum levels in BC patients, independent of the type of BC presentation, and in controls. Patients carrier of BRCA1/2 mutation seemed to possess lower ability of DHA epoxidation, whereas luminal A-like BC patients showed higher EDP conversion. This pattern should be further investigated in a larger population.

**Disclosure of Interest:** None declared.

#### SUN-PO072

### EFFECTS OF NUTRITIONAL INTERVENTION ON SURVIVAL IN ONCOLOGY PATIENTS

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**Rationale:** Malnutrition can reduce survival of oncology patients. The aim of this study was to detect the effect of early detection of malnutrition and early nutritional intervention on survival.

**Methods:** Patients with solid tumors undergoing chemotherapy treatment and with Malnutrition Screening Tool  $\geq 2$  were referred to the Nutrition Unit (NU) from February 2013 to June 2016 (intervention group, IG). We compared survival of this group of patients with those with solid tumors treated with chemotherapy before implementing the nutritional screening (control group, CG), referred or not to the NU. Nutritional counseling was given to all the patients and nutritional treatment was prescribed according guidelines. Survival was assessed with Kaplan-Meier analysis and Cox regression.

**Results:** 106 patients were included in the IG and 167 patients were included in the CG (43 submitted to the NU without nutritional screening). There were no significant differences in age, gender, weight and weight loss before chemotherapy treatment, primary tumor location and tumor stage between groups.

Mortality was higher in the CG (63.5% vs 58.5%;  $p = 0.044$ ). Comparing survival between groups stratifying in CG by submission or not to the NU we found that survival was: 28 (SE 6.1) months in IG, 42 (SE 6.6) months in CG not referred and 17 (SE 3.5) months in CG referred to the NU (HR = 1.00, 95%CI 0.85–1.19;  $p = 0.971$ ).



Finally, we compared survival between IG and patients in CG that were not submitted to the NU, and we found a median survival of 28 (SE 8.6) months in IG and 39 (SE 5.6) months in these patients of the CG (HR = 1.02, 95%CI 0.72–1.45;  $p = 0.925$ ).

**Conclusions:** Early nutritional intervention increases survival in oncology patients, although a higher sample size is needed to determine if the differences are statistically significant.

**Disclosure of Interest:** None declared.

#### SUN-PO073

##### MUSCLE MASS AND MUSCLE STRENGTH IN ONCOLOGY PATIENTS AFTER NUTRITIONAL INTERVENTION

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**Rationale:** Malnutrition is highly prevalent in oncology patients and its etiology is multifactorial. The aim of this study was to detect the impact of nutritional intervention on body composition (BC) and muscle strength in oncology patients.

**Methods:** Patients with solid tumors undergoing chemotherapy treatment and with Malnutrition Screening Tool  $\geq 2$  were referred to the Nutrition Unit from February 2013 to June 2016. A BC analysis, hand-grip strength test and 24-h dietary recall were performed. Nutritional counseling was given to all patients in the first visit (V1) and nutritional treatment was prescribed when needed. We compared changes in BC and muscle strength between the first and second visit (V2), as well as dietary intake.

	V1	V2	p value
Muscle mass (kg)	49.9(10.3)*	48.7(8.7)*	0.234
Muscle mass index (kg/m <sup>2</sup> )	18.2(2.3)*	18.4(2.3)*	0.156
Hand-grip strength (kg)	26.0(14.8)**	26.5(12.35)**	0.017
Intake (kcal)	1755.5(573.1)*	2175.8(750.8)*	<0.001
Carbohydrates (g)	199.2(372)**	228.9(541.8)**	<0.001
Carbohydrates (%)	47.5(10.0)*	44.9(9.0)*	0.034
Protein (g)	71.7(171.4)**	88.6(167.7)**	<0.001
Protein (%)	17.0(4.2)*	16.5(3.9)*	0.345
Protein (g/kg)	1.11(0.62)**	1.37(0.58)**	<0.001
Fat (g)	69.5(29.4)*	93.3(40.1)*	<0.001
Fat (%)	35.5(8.4)*	38.6(8.4)*	0.003

\*mean (SD);

\*\*median (IQR).

**Results:** 106 patients were included. Median age was 68.5 (15.3) years and 60.4% were male. Their weight loss before chemotherapy treatment was 8.2 (SD 6.0) kg [11.0% (SD 7.5%)]. Colorectal tumors were the most frequent (43.4%). 24.5% patients received radiotherapy treatment and in 63.2% surgery was also performed. Median time between V1 and V2 was 8 (IQR 11) weeks.

No statistically differences were found between V1 and V2 on weight [63.6 (SD 11.8) vs 64.4 (SD 11.2) kg;  $p = 0.425$ ], BMI [23.8 (SD 4.4) vs 24.5 (SD 4.2) kg/m<sup>2</sup>;  $p = 0.139$ ] and fat mass [16.2 (SD 8.0) vs 15.9 (SD 7.2) kg;  $p = 0.797$ ].

There were no differences in BC, dietary intake and hand-grip strength according to primary tumor location or tumor stage.

**Conclusions:** Nutritional intervention increases energy and protein intake, which has a positive effect on hand-grip strength.

**Disclosure of Interest:** None declared.

#### SUN-PO074

##### NUTRITIONAL STATUS AND MUSCLE FUNCTION IN PRE-CHEMOTHERAPY PATIENTS

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**Rationale:** Malnutrition in cancer patients is multifactorial, encompassing tumor/host interactions, anorexia, systemic inflammatory responses, and changes in nutrient metabolism with increase in energy expenditure. These factors contribute to weight loss, sarcopenia and cachexia. Malnutrition prevalence is estimated to be between 45 and 60%, being associated to increase in complications, impaired treatment tolerance and response, decreased quality of life and increased mortality. In this context, loss in muscle function poses grave consequences in loss of functions and increased morbimortality. Our aim is to describe and assess the relationship between nutritional status and muscle function in pre-chemotherapy patients.

**Methods:** Cross-sectional observational study conducted in neoplasia patients followed in Hospital Garcia de Orta, before chemotherapy. Nutritional status was assessed with Patient Generated Subjective Global Assessment (PG-SGA) and Body Mass Index (BMI). To determine muscle function, Handgrip Dynamometry was employed (HGD).

**Results:** Fifty (50) patients were evaluated. According to BMI, 16% presented low weight; with HGD, 18% presented low handgrip strength. In PG-SGA classes, most patients (60%) were malnourished. Mean PG-SGA score was 8, pointing to need for nutritional intervention. Nutritional status was defined by BMI and PG-SGA was not significantly correlated to muscle function ( $p = 0.66$ ;  $p = 0.07$ ).

**Conclusions:** According to PG-SGA, 60% of patients were malnourished. No statistically significant correlation between PG-SGA, BMI and muscle function was found. The present study reinforces the importance of early nutritional assessment through adequate tools, so as to revert or mitigate the negative impact of malnutrition.

**Disclosure of Interest:** None declared.

#### SUN-PO075

##### NUTRITIONAL MANAGEMENT IN PATIENTS WITH SUGARBAKER'S PROCEDURE

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**Rationale:** Peritoneal carcinomatosis (PC) is associated with high morbidity and there is a direct relationship between nutritional status and the presence of complications in the Sugarbaker's procedure (SBP).

**Methods:** A retrospective study from 2012 to 2019 of the nutritional management of SBP patients was done. Anthropometric and analytic parameters (albumin, prealbumin, lymphocytes, ...), chemotherapy and tumor type prior to the intervention were used for the diagnosis of protein malnutrition following the Spanish consensus.

In the postoperative follow-up, parenteral nutrition (PN) composition, days in intensive care unit (ICU), total hospitalization days and postoperative complications were studied. Statistical analysis was done with Stata®12.0.

**Results:** Fifty-four patients received PN with a mean age of 60.1 (SD = 11.3) years and mean body mass index (BMI) of 25.2 (SD = 4.0) kg/m<sup>2</sup>. Colorectal (n = 27) and gastric (n = 13) were the most common cancer types. Protein malnutrition was observed in a total of 35

patients, 13 (72.2%) of those had a BMI >25 kg/m<sup>2</sup>. Complications were recorded in 61% of the total patients.

No statistically significant differences were found between malnutrition and hospitalization days or complications.

The average composition formula per kilogram day was 1.7 g of Amino acids, 3.6 g of carbohydrates and 1 g of lipids. The median duration of the PN and of the total hospitalization and ICU days were 8 (4–47); 21.8 (4–80) and 17 (2–54), respectively.

When the NP was stopped, the oral intake was at least 60% of the calculated total energy requirements (TER) in 46% of the patients.

**Conclusions:** Protein malnutrition has high prevalence 72.2% in patients with PC despite BMI >25 kg/m<sup>2</sup>.

The relationship between malnourished patients and worse clinical outcomes could not be found.

The macronutrient composition of PN is similar to the nutritional requirements in critically ill patients.

The transition between PN and oral intake should be done when the 2/3 of TER are tolerated.

**Disclosure of Interest:** A. Gutierrez Lizarazu Other: Nothing to declare, P. Yarnoz Esquiróz Other: Nothing to declare, C. Silva Froján Other: Nothing to declare, M. Riestra Vázquez Other: Nothing to declare, C. Lacasa Arregui Other: Nothing to declare.

#### SUN-PO076

##### THE IMPACT OF PREOPERATIVE NUTRITIONAL SUPPORT IN PATIENTS WITH GASTROINTESTINAL CANCER QUALIFIED FOR SURGERY FOR EARLY TREATMENT RESULTS

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**Rationale:** Malnutrition affects more than half of patients at the time of diagnosis, before any therapy is started. It is one of the causes of a weaker response to the anti-cancer treatment and more frequent occurrence of adverse effects and serious complications of anti-cancer therapy, which force medical team to prematurely terminate it. The aim of the study was to evaluate the effect of 14-days preoperative supplementation using high protein diet before surgery for selected biochemical parameters and treatment outcomes (number and type of postoperative complications), as well as duration of hospitalization in patients undergoing cancer resection.

**Methods:** 14 days prior the admission to the Clinic patients received high protein diet, Novasource GI Advance in addition to normal diet. Nutritional assessment was done based on biochemical and anthropometric measurements and NRS, SGA questionnaires. After recruitment to the research group, the patients from complementary groups who did not receive pre-operative nutritional supplementation were analyzed. Groups were not significantly different in demography, surgery type or diagnosis.

**Results:** 62 patients were qualified to the research group. The size of the control group was 60. Both the total hospitalization time (13.7 vs 16.9 days) and the time of hospitalization after surgery (8.8 vs 12.9) in the research group were lower ( $p < 0.05$ ). There was also a decrease in number of septic complications in the group consuming supplement (8 vs 16). There were no significant differences in the results of NRS/SGA questionnaires, the duration of ICU stays and the duration of antibiotic therapy.

**Conclusions:** The study shows benefits of preoperative nutritional support in patients with gastrointestinal cancer qualified for surgery for early treatment results, however, more research is still needed.

**Disclosure of Interest:** None declared.

#### SUN-PO077

##### PATIENTS UNDERGOING ALLOGENIC STEM CELL TRANSPLANTATION SUFFER FROM POOR NUTRITIONAL STATE DESPITE SUPPLEMENTATION

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**Rationale:** Inadequate food intake, muscle wasting, chemotherapy, and multiple complications are common in hematologic oncologic patients undergoing allogenic stem cell transplantation (SCT), lead to poor nutritional state and decrease overall survival. We studied in patients listed for SCT, whether despite nutritional routine care the nutritional state continued to decrease.

**Methods:** The interim analysis of a prospective observational study included 61 patients with AML, ALL, or MDS and indication for SCT. Patients were recruited before SCT with a one-year follow-up. Body weight, weight loss, hand grip strength, nutritional intake, and enteral (ONS)/parenteral (PN) supplementation has been obtained before, 30, 90, and 365 days after SCT.

**Results:** Mean age at time of enrollment was 55.4 ± 12.7 years, the average BMI was 26.7 ± 5.4 kg/m<sup>2</sup>. During follow-up, 15 patients (25%) died and 8 (13%) dropped out. Body weight decreased from 84.1 ± 19.1 kg 6 month before to 73.3 ± 14 kg one year after SCT ( $p < 0.001$ ). Hand grip strength decreased after 30, 90 (both 30.5 ± kg;  $p < 0.001$ ), and 365 days (31.6 ± 11.8 kg;  $p = 0.009$ ) compared to data before SCT (34.4 ± 12.5 kg). The severity of weight loss before SCT correlated with a decrease in handgrip strength in all study visits after SCT ( $p < 0.001$ ). 20 patients (33%) before SCT, 37 patients (71%) around the time of SCT, and 24 patients (50%) after SCT indicated to eat less than 75% of their normal portion size, although 14 patients (23%) before SCT and 31 patients (60%) after SCT received nutritional supplements. Around hospitalization for SCT, 11 patients (20%) received ONS, 12 patients (22%) PN, and 18 patients (33%) received both.

**Conclusions:** Although hematologic SCT patients receive nutritional supplements, results show poor nutritional state and high mortality. Routine nutritional care is not sufficient. An intervention study comparing routine with individualized care is needed.

**Disclosure of Interest:** None declared.

#### SUN-PO078

##### HOME PARENTERAL NUTRITION IN ADVANCED OVARIAN CANCER: MAKING AND IMPLEMENTING THE DECISION

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**Rationale:** Increasingly, patients with advanced ovarian cancer in bowel obstruction are receiving home parenteral nutrition (HPN). HPN is contentious in this situation as it may increase the burden on patients with palliative needs and little is known about the decision making process. The aim of this study was to explore how decisions for HPN are taken and to investigate barriers and facilitators to implementation.

**Methods:** This was a qualitative study underpinned by phenomenology. Ninety-three longitudinal in-depth interviews were undertaken with 20 patients with advanced ovarian cancer in bowel obstruction receiving parenteral nutrition, their relatives and healthcare professionals over 14 months. Participants were interviewed a maximum of

four times. Interview transcripts were analysed thematically guided by the techniques of Van Manen [1].

**Results:** We found variance between oncologists and patients regarding ownership of the decision for HPN. The oncologists believed they were engaging in shared decision making, whereas patients felt that the decision was driven by the oncologist. Nevertheless they were content to have the treatment as they viewed the choice as HPN or death.

The principal mutable barrier was difficulties in communication across professional disciplines and organisations. Facilitators to a timely discharge included developing single point of contact between organisations, improving communication and implementing standardised clinical and operational processes.

**Conclusions:** Oncologists and patients differ in their perceptions of how treatment decisions are made. Although patients are satisfied with the process, it may be beneficial for healthcare professionals to ratify patients' understanding of treatment.

#### Reference

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#### SUN-PO079

##### ANXIETY LEVEL, DIETARY INTAKE, AND NUTRITIONAL STATUS OF PEDIATRIC CANCER PATIENTS UNDERGOING CHEMOTHERAPY IN YOGYAKARTA, INDONESIA

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**Rationale:** Cancer treatment may trigger the feeling of worry and fear in children which can result in decreased dietary intake. As nutritional status plays a pivotal role in determining the prognosis of cancer, factors such as anxiety and dietary intake that contribute to nutritional status need to be identified.

**Methods:** Anthropometric data were collected from a total of 85 pediatric cancer patients undergoing chemotherapy at Dr. Sardjito Hospital, Indonesia. Dietary intakes were assessed using 2 × 24 hour recall questionnaire and data were compared to individual needs to determine nutritional adequacy. Supporting data associated with treatment and food intake were collected from medical records or by interviewing patients using questionnaire. Assessment of anxiety was performed using Indonesian translated version of PROMIS Parent Proxy Short-Form v2.0 for Anxiety questionnaire that had been validated prior to the study.

**Results:** Around sixty percent of the children had normal nutritional status according to BMI for age, while 23.6% others were underweight and 16.5% others fell into overweight or obese category. Inadequate energy, fat, and carbohydrate intakes were found in approximately a third of the patients (29.4–37.6%). No statistically significant correlation between nutritional status and dietary intake were found ( $p > 0.05$ ). Anxiety level was not correlated with nutritional status ( $p > 0.05$ ), even though moderate to severe anxiety levels were observed in 33.3% of patients. A small negative correlation was found

between anxiety level and carbohydrate intake ( $r = -0.23$ ,  $p = 0.04$ ). Patients with nausea or vomiting were found to present more with inadequate energy intake than those with no such symptoms ( $\chi^2 [n = 73] = 6.68$ ,  $p = 0.035$ ).

**Conclusions:** In this study, anxiety level was not correlated with dietary intake of patients except for carbohydrate. Nausea or vomiting was associated with energy adequacy which signified the need to address this problem in nutrition intervention.

**Disclosure of Interest:** None declared.

#### SUN-PO080

##### WHEY PROTEIN WORSENS SURVIVAL OF MICE WITH CARCINOMATOUS PERITONITIS BY ENHANCING PD-1 RECEPTOR EXPRESSION ON CD8<sup>+</sup>T CELL

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**Rationale:** Whey protein (WP) is now expected to improve host response against various surgical stress. However, its effects on cancer progression remain unclear. Here, we investigated a WP rich diet on cancer immunity using a murine Panc02 induced carcinomatous peritonitis model.

**Methods:** Exp. 1 Male C57BL/6J mice (8 weeks old,  $n = 32$ ) were fed a casein diet (CD,  $n = 16$ ), or whey protein diet (WPD,  $n = 16$ ). On day 7, Panc02 cancer cells ( $1 \times 10^6$ /body) were inoculated i.p. Survival was monitored for 46 days.

Exp. 2: Mice (CD;  $n = 13$ , WPD;  $n = 13$ ) subject to the same protocol as in Exp.1 were killed on day 35. All peritoneal cancer nodules were harvested and weighed. Immune cells in the peritoneal cavity and tumor nodules were analyzed by flow cytometry to detect CD8 positive T cells and Natural Killer (NK) cells as anti-tumor immune cells, then regulatory T cells (Treg) and the expression of programmed cell death 1 (PD-1) on CD8 positive T cells as key components of immune evasion of cancer cells.

**Results:** WP worsened survival and increased PD-1 expression on CD8 positive T cells in cancer nodules as compared with CD.

WP worsened survival and increased PD-1 expression on CD8 positive T cells in cancer nodules as compared with CD.

		CD	WPD
	Survival (days)	38.2 ± 0.8	35.3 ± 0.9*
	Tumor (g/body)	1.46 ± 0.1	1.59 ± 0.1
Peritoneal washing	CD8 <sup>+</sup> T cell ( $\times 10^6$ )	3.4 ± 1.1	4.0 ± 1.2
	NK cells ( $\times 10^5$ )	7.5 ± 2.7	4.2 ± 1.1
	Treg ( $\times 10^5$ )	4.7 ± 1.6	5.3 ± 2.0
	PD-1 <sup>+</sup> CD8 T cells (%)	3.0 ± 0.7	2.9 ± 0.5
Cancer nodules	CD8 T cells ( $\times 10^5$ )	7.9 ± 1.4	6.6 ± 1.1
	NK cells ( $\times 10^6$ )	1.1 ± 0.2	1.1 ± 0.2
	Treg ( $\times 10^5$ )	1.0 ± 0.2	1.1 ± 0.1
	PD-1 <sup>+</sup> CD8 T cells (%)	3.6 ± 0.4	5.1 ± 0.5 <sup>†</sup>

Mean ± SE

\* $p < 0.05$  vs. ND, log-rank test, <sup>†</sup> $p < 0.05$  vs. ND, t-test

**Conclusions:** Use of WP in cancer patients might worsen prognosis through PD-1 expression on CD8 positive T cells.

**Disclosure of Interest:** None declared.



### SUN-PO081 EFFECTS OF DIFFERENT TYPES OF LOW-CARBOHYDRATE HIGH-FAT DIETS ON CANCER IMMUNE EVASION THROUGH PD-1 EXPRESSION

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**Rationale:** In patients with advanced cancer, nutritional management is recommended to control carbohydrates and increase the ratio of lipids (ESPEN guidelines on nutrition in cancer patients, 2016). However, we previously found a lard-based low-carbohydrate high-fat diet (LCHFD) to worsen anti-cancer immunity and survival compared to a normal diet (ND) in a murine Panc02 pancreatic cancer peritonitis (CP) model. Continued research showed that LCHFD rich in soy oil produced an even worse outcome, while fish oil supplemented LCHFD ( $\omega 6/\omega 3 = 2.1$ ) maintained cancer immunity and improved survival. In recent years, immune checkpoint molecules such as programmed cell death protein 1 (PD-1) has been shown potent immunomodulatory effects on cancer treatment. Since PD-1 receptor expression on CD8<sup>+</sup> T cell has been demonstrated to cause cancer immune evasion, we examined influences of an ND and three types of LCHFD (lard, soybean oil, fish oil) on its expression in the CP model.

**Methods:** Male C57BL/6j mice (8 weeks old, n = 46) were fed a normal diet (ND), fish oil-containing LCHFD (HF-F), soy oil-based LCHFD (HF-S) or lard-based LCHFD (HF-L). Each LCHFD contained 60% energy from fat, 20% from protein and 20% from carbohydrate. On day 7, Panc02 cancer cells ( $1 \times 10^6$ /body) were inoculated i.p. The mice were killed on day 35. Peritoneal washings and visible tumor nodules were collected from each mouse. The PD-1 receptor expression ratio in CD8 positive T cells in the peritoneal washing and tumor were evaluated by flow cytometry.

**Results:** The PD-1 receptor expression was higher in the peritoneal washing in the HF-S group and lower in the tumor infiltrating CD8 positive T cells in the HF-F group than in the ND group. The HF-F group maintained CD8<sup>+</sup> T cell number in the tumor compared to the HF-S and HF-L groups.

	Peritoneal washing CD8 <sup>+</sup> T cells ( $\times 10^5$ )	Tumor		
		PD1 <sup>+</sup> CD8 <sup>+</sup> Tcells (%)	CD8 <sup>+</sup> T cells ( $\times 10^5$ )	PD1 <sup>+</sup> CD8 <sup>+</sup> Tcells (%)
ND	2.0 ± 0.7	59.1 ± 4.6	6.2 ± 1.6	86.2 ± 1.7
HF-F	3.7 ± 0.7	59.9 ± 2.6	7.1 ± 0.8	78.5 ± 3.8*
HF-S	2.9 ± 0.6	74.4 ± 1.7* †	4.2 ± 0.3 <sup>†</sup>	87.9 ± 1.6
HF-L	2.3 ± 0.5	65.4 ± 4.8	4.2 ± 0.5 <sup>†</sup>	84.4 ± 1.4

Mean ± SE, \*p < 0.05 vs. ND, †p < 0.05 vs. HF-F

**Conclusions:** It appears that influences of the soybean or fish oil rich diet on cancer immunity are mediated by modulation of PD-1 expression. The present data may suggest that, when administering LCHFD to cancer patients, we should pay attention to the impact of the type of fat on cancer immunity.

**Disclosure of Interest:** None declared.

### SUN-PO082 FEASIBILITY, SAFETY AND PROGNOSTIC FACTORS IN PATIENTS WITH ESOPHAGEAL CANCER UNDERGOING ENDOSCOPIC GASTROSTOMY

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**Rationale:** Esophageal cancer (EC) is an important health problem worldwide with high morbidity and mortality. Patients with EC are likely to develop malnutrition. Nutritional support plays an important role on the disease management. The aim of this study was to assess the feasibility and safety of endoscopic gastrostomy (PEG) feeding in EC cancers and to identify risk factors associated with poor prognosis.

**Methods:** A retrospective observational study was performed using records from EC patients referred to gastrostomy. Age, gender, histologic subtype cancer, indication for gastrostomy and mortality data were recorded. NRS 2002, body mass index (BMI), hemoglobin, serum albumin, transferrin and total cholesterol were collected at the day of PEG.

**Results:** Data from 41 EC patients (36 men and 5 women) aged 39–88 years (mean 62 years). 37 patients were diagnosed with squamous cell carcinoma (6 of them with hypopharynx invasion) and 4 patients with adenocarcinoma. Gastrostomy was possible in all patients referred to PEG (27 patients selected for curative treatment and 14 patients for palliative nutrition). No major complications occurred. Mean survival after PEG was 18.1 months and mortality rate at 3 months was 31.7%. The majority of the patients (34; 82.9%) died with PEG. In 7 patients (17.1%), PEG tube was removed due to adequate oral intake. Mean BMI was 21.3 Kg/m<sup>2</sup> and 34.1% patients displayed low BMI. Anemia in 17 patients (41.5%). Serum albumin, transferrin and total cholesterol were low in 10 (24.4%), 20 (48.8%) and 18 (43.9%) patients, respectively. Higher BMI (R = 0.30), serum albumin (R = 0.41) and transferrin (R = 0.47) tend to be positively correlated with survival (p < 0.05).

**Conclusions:** PEG is a feasible and safe technique for enteral feeding in EC patients. Higher BMI, serum albumin and transferrin levels at admission predict a better outcome. Enteral feeding through PEG should be early considered in EC patients due to higher risk of malnutrition, which is associated with shorter survival.

**Disclosure of Interest:** None declared.

### SUN-PO083 NUTRITIONAL STATUS, FUNCTIONAL STATUS AND QUALITY OF LIFE – WHAT IS THE IMPACT ON CANCER PATIENTS?

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**Rationale:** Malnutrition is common in cancer patients and multifactorial, combining the systemic inflammatory process with decreased food intake, loss of muscle and bone mass, and decreased functional status. Failure to identify malnutrition leads to poor prognosis with increased morbimortality, length of stay and health care costs as well as decreased response and tolerance to treatments, functional status, and quality of life. Our aims was track and evaluate the nutritional status of cancer patients. Associate results between hospitalization and Day Hospital (DH). Associate nutritional status and symptoms with nutritional impact. Associate nutritional status with tumour location and functional status.

**Methods:** Cross-sectional observational study in hospitalized patients or DH from Hospital Garcia de Orta, over 18 years old. Nutritional status was monitored through NRS-2002 and evaluated through the Patient-Generated Subjective Global Assessment (PG-SGA) and anthropometric and biochemical parameters. Body Mass Index (BMI) was used for weight classification. Functional status was assessed using the Eastern Cooperative Oncology Group (ECOG), Karnofsky Performance Scale Index scales and handgrip dynamometer. The tumour type/location was also identified by TNM classification to verify the prevalence associated with malnutrition.

**Results:** We included 170 patients (65 hospitalized and 105 in DH), mean age of 65.6 ± 12.9 years [29–90]. 32% of hospitalized patients and

14% in DH had low BMI. From the NRS-2002, 88% and 36% of the patients were respectively at nutritional risk, and by PG-SGA, 92% and 41%, respectively, were malnourished. In the malnourished patients' tumours located in the lymph nodes, lungs, colon, bone marrow and stomach prevailed. NRS-2002 and PG-SGA score were positively correlated with ECOG score ( $p < 0.01$  for DH;  $p < 0.05$  for hospitalized) and negatively correlated with Karnofsky score ( $p < 0.01$ ). PG SGA correlation was stronger than NRS-2002.

**Conclusions:** PG-SGA, as well as functional status scales, have proven to be the appropriate and validated tools for early identification of malnutrition and functional status in cancer patients. In addition, handgrip dynamometer can be a useful tool for assessing functional and nutritional status.

**Disclosure of Interest:** None declared.

#### SUN-PO084

##### EFFECTS OF RADIOTHERAPY-RELATED SYMPTOMS ON THE NUTRITIONAL STATUS OF HEAD AND NECK CANCER PATIENTS

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**Rationale:** Cancer of head and neck has a high mortality rate, undernutrition is considered as one of the most serious problems among cancer patients. increased morbimortality. The aim of this study was to evaluate symptoms, dietary intake, and nutritional and functional status of head and neck cancer patients undergoing radiotherapy.

**Methods:** This was a qualitative, longitudinal study on adult patients with head and neck cancer in a tertiary hospital at Porto Alegre (Rio Grande do Sul, Brazil), who were assessed at three time points: at first, third, and last (sixth) week of radiotherapy. Patients answered questionnaires addressing food intake (24-hour dietary recall) symptoms (xerostomia, odynophagia, dysphagia, stomatitis, dysgeusia, nausea and vomiting), therapy (concomitant chemotherapy), and nutritional status (anthropometry and Subjective Global Assessment). We also performed the anthropometric assessment (body weight, height, arm circumference, tricipital skinfold thickness) and functional assessment (thickness of the adductor pollicis muscle and hand grip strength) of patients. The protocol was approved by the Ethical Committee of the hospital. Data were tested for normality using the Kolmogorov-Smirnov and Bartlett tests. Pearson and Spearman tests were used to test correlations between number of symptoms, food intake, and nutritional and functional status.

**Results:** Fifty-four patients (81% men) completed the study. At the onset of treatment, the mean age was  $60 \pm 10$  years. During the six weeks of radiotherapy, values of muscle arm circumference, arm muscle area and adductor pollicis muscle thickness decreased ( $p < 0,05$ ), while all other outcome measures decreased during the first half of treatment ( $p < 0,05$ ) and 76% of patients lost weight. The intake of protein, energy and carbohydrate decreased in the beginning of therapy. The prevalence of undernourished patients increased from 27% to 47%. All symptoms were significantly associated with Global Subjective Assessment scores and muscle arm area.

**Conclusions:** The increase in the number of reported symptoms was related with impairment of nutritional status and decrease of lean body mass of patients at first, second, and last (sixth) week of radiotherapy. Changes observed in the first half of treatment indicate the importance of an early nutritional intervention.

#### Reference

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**Disclosure of Interest:** None declared.

#### SUN-PO085

##### THE EFFECT OF PREOPERATIVE NUTRITIONAL SUPPORT ON LUNG CANCER PATIENTS

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**Rationale:** Aim of the study was to investigate the effect of preoperative nutritional support on postoperative morbidity, mortality and length of stay in patients with non-small cell lung cancer.

**Methods:** This study was carried out retrospectively on 181 patients between January and December 2017 in a single center. Descriptive statistics, chi-square, Mann-Whitney u and regression analysis were used.

**Results:** 81.2% of the patients were male and 18.8% were female. The mean age was 59.74. The mean body mass index was  $25,33 \pm 3,87$  kg/m<sup>2</sup>. 52.5% of the patients had NRS 2002 score 2; 30.4% of 3, 12.7% of 4, 4.4% of 5. While 38.1% of the patients developed complications; the rate of major complications was 18.8%. Mean hospitalization time was 7.67 days. Complications were observed in 62.5% (n = 5) of the patients whose NRS 2002 scoring was 5, while this ratio was 39.1% (n = 9), 21.8% (n = 9) 12) and 45.3% (n = 43) in patients with NRS scoring 4, 3 and 2 respectively ( $p = 0.016$ ). It was found that overall complication development increased 7.2 times by diabetes; 5,1 times by chest wall resections; 2,7 times by taking NRS 2002 score 2 thus not receiving nutritional support; 8,7 times by taking NRS 2002 score 5. Pneumonectomy, chest wall resections and not receiving nutritional support were increased major complication rate by 4,6; 7,8 and 10,1 times respectively.

**Conclusions:** In patients receiving nutritional support, the incidence of complications were significantly decreased, hospitalization time was shortened and albumin loss was less in the postoperative one month. Pneumonectomy, chest wall resection and not receiving nutritional support were factors that increased major complication rate. We recommend patients with extended lung resection should be given nutritional support treatment even though the level of nutrition is adequate with pre-evaluation tests. Surgical resections of NRS 2002 score 5 patients should be delayed.

**Disclosure of Interest:** None declared.

#### SUN-PO086

##### EARLY TUBAL JEJUNOSTOMY FEEDING IN PATIENTS WITH GASTRIC CANCER UNDERGOING CURATIVE GASTRECTOMY

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**Rationale:** Early enteral nutrition (EEN) within 24 hours after gastrointestinal (GI) surgery is recommended to improve not only quality of life (QOL) but also nutritional status and clinical outcomes, especially in patients undergoing colon resection. However, the timing of EN after upper GI surgery is not clearly defined. Considering impaired postoperative gastric emptying and subsequent vomiting after diet intake, EEN was achieved in 52% patients undergoing total gastrectomy for gastric cancer (GC) and in 63% patients undergoing pancreaticoduodenectomy. Tubal jejunostomy feeding is one of the strategies to ensure EEN possible. The aim of the present study is to compare early tubal jejunostomy feeding with no jejunostomy made after curative resection for GC.

**Methods:** One hundred and ninety six patients with GC undergoing curative resection were enrolled. Early tubal jejunostomy feeding within post-operative 48 hours was conducted in 119 patients and the rest 77 patients were fed by mouth or naso-gastric tube that might or might not after first bowel movement.

**Results:** Longer post-operative hospital stay was observed in early jejunostomy feeding group ( $16.62 \pm 13.04$  vs.  $10.51 \pm 4.83$  days;  $p < 0.001$ ). There were significantly more post-operative complications in early tubal jejunostomy feeding group than in no jejunostomy group (32.8% vs. 19.5%;  $p = 0.042$ ). Period of post-operative antibiotics administration was as well significantly longer in the tubal jejunostomy feeding group ( $10.30 \pm 11.65$  vs.  $7.22 \pm 5.16$  days;  $p = 0.03$ ).

**Conclusions:** Although EEN is recommended GI surgery, it is still doubtful for patients with GC after curative gastrectomy in consideration of short post-operative time.

**Disclosure of Interest:** None declared.

#### SUN-PO087

##### VALUE OF NUTRITIONAL PARAMETERS AS PREDICTORS OF MORTALITY WITHIN 2 YEARS AFTER ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION

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**Rationale:** Limited data are available on the prognostic value of nutritional parameters in patients undergoing allogeneic stem cell transplantation (allo-SCT). We aimed to evaluate the prognostic value of various nutritional parameters and to determine which were predictors of mortality within 2 years after allo-SCT.

**Methods:** A retrospective, single-center study was performed in patients who received allo-SCT between 1 January 2013 to 30 June 2016. Their data on weight loss compared to usual body weight (WL), BMI, mid-arm circumference (MAC), hand-grip strength (HG) and albumin (Alb) were collected at 3 times: the day of admission (before the chemotherapy/radiotherapy conditioning regimen, d-7), the day following allo-SCT (d1) and 3 months later (d100). Parameters related to the patient, transplantation, complications and outcome within 2 years after allo-SCT were also collected. Univariate analysis (Kaplan-Meier curves and logrank test) and multivariate adjustment (Cox proportional hazards model) were used to determine which factors were associated with overall survival within 2 years after allo-SCT.

**Results:** Among the 276 patients included (113 F, 163 M) aged  $49 \pm 15$  years, 53% underwent allo-SCT for acute leukemia, 17% for myelodysplastic syndrome, 12% for lymphoma, 5% for myeloproliferative syndrome, 5% for multiple myeloma, 4% for aplastic anemia, and 4% for other causes. The WL increased between d1 and d100 ( $-3.9 \pm 8.2\%$  and  $-9.4 \pm 10.2\%$ ,  $p < 0.0001$ , paired t-test). The prevalence of malnutrition doubled between admission (32%) and d100 (68%), according to

the following anthropometric criteria:  $WL \geq 5\%$  or  $BMI < 18.5 \text{ kg/m}^2$ . In univariate analysis, some nutritional parameters were associated with shorter survival within 2 years:  $WL \geq 5\%$  ( $p = 0.005$ ) and  $Alb \leq 35 \text{ g/L}$  ( $p = 0.015$ ) at d-7;  $WL \geq 5\%$  ( $p = 0.005$ ),  $WL \geq 10\%$  ( $p = 0.0035$ ),  $MAC \leq 27 \text{ cm}$  ( $p = 0.045$ ) and  $Alb \leq 30 \text{ g/L}$  ( $p = 0.0001$ ) at d1;  $WL \geq 5\%$  ( $p = 0.017$ ),  $WL \geq 10\%$  ( $p = 0.0008$ ),  $IMC < 18.5 \text{ kg/m}^2$  ( $p = 0.0076$ ) and  $HG \leq 25 \text{ kg}$  ( $p = 0.0009$ ) at d100. In multivariate analysis, the best predictors of mortality within 2 years were:  $Alb \leq 35 \text{ g/L}$  at d-7 ( $HR = 2.02$  [1.12–3.66],  $p = 0.02$ ),  $Alb \leq 30 \text{ g/L}$  at d1 ( $HR = 2.19$  [1.29–3.71],  $p = 0.004$ ) and  $HG \leq 25 \text{ kg}$  at d100 ( $HR = 2.58$  [1.3–5.1],  $p = 0.0063$ ). For each of the 3 times considered, nutritional parameters outweighed other usual prognostic criteria (severe acute graft versus host disease, myeloablative conditioning, peripheral blood stem cell transplant, donor with a positive cytomegalovirus status and infection). Regardless of the parameter and time considered, a  $HG \leq 25 \text{ kg}$  at d100 appeared to be the best independent predictor of mortality within 2 years after allo-SCT.

**Conclusions:** This study confirms that malnutrition is an independent factor of mortality in patients undergoing allo-SCT. It also reveals that 3 months after the transplantation, an alteration of the hand-grip strength represents a major prognostic marker to be taken into account when monitoring these patients. In the future, it would be interesting to see whether the early management of sarcopenia induced by the allo-SCT procedure improves the survival of these patients.

**Disclosure of Interest:** None declared.

#### SUN-PO088

##### ONCOLOGY TREATMENT-RELATED AND PATIENT-RELATED FACTORS THAT INFLUENCE FAT LOSS IN BREAST CANCER PATIENTS

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**Rationale:** Breast cancer patients frequently present sarcopenic obesity – type of obesity that can affect both normal weight and overweight or obese patients that is not necessarily generated by an excessive food intake, but by sarcopenia indirectly generated by chemotherapy and antiestrogenic treatment. Sarcopenic obesity associates increased mortality, recurrence and metastases risks in breast cancer patients.

**Methods:** To counteract it, we proposed an at-home oncology nutrition intervention based on foods naturally high in proteins, omega-3 fatty acids, high-quality carbohydrates, calcium, probiotics and prebiotics to 614 ER+/PR±/HER2- breast cancer patients under antiestrogenic treatment (AET). 331 patients were randomly assigned to the Control Group (CG), with no nutrition advice besides physicians' recommendation to avoid weight gain. 283 patients were randomly assigned to the Intervention Group (IG) and asked to follow the proposed diet. We measured weight and body composition and we compared results at 24 months between groups using the Mann-Whitney and the Wilcoxon tests. Then we analyzed results based on the type of oncology treatment administered and on patients' age, lifestyle and comorbidities.

**Results:** Results were modest, but IG Patients obtained statistically significant weight loss and fat loss lost weight with no muscle mass loss while CG patients maintained weight, increased fat and lost muscle.

The only oncology treatment-related factor that influenced efficacy was the type of AET: patients on Aromatase Inhibitors lost more weight and visceral fat than patients on Tamoxifen. Efficacy was not



influenced by: chemotherapy and radiotherapy administration, by the type of breast surgery or by salpingo-oophorectomy.

About the patient-related factors, efficacy was not influenced by the dieting history of the patients before the diagnosis, and it was influenced by: de novo thyroid disease and sleep disturbances which accentuated sarcopenia; by statins coadministration in patients on Anastrozole or Exemestane and by depression which decreased fat loss; and by the age of the patients – younger breast cancer patients had the lowest compliances and the worse results.

**Conclusions:** This oncology nutrition intervention can counteract sarcopenic obesity, but its efficacy can be influenced by the type of AET and by factors related to patients' age, sleep disturbances and comorbidities.

**Disclosure of Interest:** None declared.

#### SUN-PO089

##### WEIGHT LOSS AND BMI AS PROGNOSTIC FACTORS IN CANCER PATIENTS

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**Rationale:** Identifying prognostic factors in oncologic patients is essential to define strategies. The aim of this study was to determine the association between the grading system using weight loss (WL) and Body Mass Index (BMI) and the prognosis of patients undergoing chemo and/or radiotherapy.

**Methods:** Prospective study of adult cancer patients, at Nutrition-Oncology consultation, between April 2012 and January 2014. Clinical data (location, staging, surgery, ECOG-PS); anthropometric data (weight, height, BMI, WL in 6 months, grading system using WL and BMI (L. Martin, 2015) in 5 grades (0–4); biochemical data (albumin, C-reactive protein (CRP), modified Glasgow Prognostic Score (mGPS); symptoms using Cancer Appetite and Symptoms Questionnaire (CASQ) and with worst prognosis (53.3% grade 3 and 4). Patients were followed until March 2019. The survival time was calculated as the difference, in months, between the date of diagnosis and the date of death. Kaplan-Meier curves were used to study the effect of risk factors on survival time.

**Results:** 330 patients were included, mostly men (69.1%), with colorectal cancer (35.5%), advanced stage (40.6%), previously submitted to surgery (59.7%), good performance status (57.6% ECOG 0/1), systemic inflammation (48.8% mGPS 1/2), proposed for adjuvant (34.5%) or palliative (34.5%) treatment. The median age was 62 years, BMI was 25.1 kg/m<sup>2</sup>, WL was 7.7%, CASQ score 18, albumin 39.1 g/L and CRP 13.1 g/L. Of these, 223 patients died. Median survival was 20.9 months.

The Kaplan-Meier curves show that patients with higher weight loss and worst classification in the BMI/WL grading system had higher mortality rates. The median survival time for grade 0 was 35.2 months, decreasing to 14.1 months for grade 4.

**Conclusions:** In addition to the clinical data, factors related to patient nutritional status, like weight loss and gradient system (BMI/WL) may be useful in predicting mortality.

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**Disclosure of Interest:** None declared.

#### SUN-PO090

##### ESTIMATING THE INCIDENCE AND PREVALENCE OF CANCER-RELATED WEIGHT LOSS AND SARCOPENIA IN THE REPUBLIC OF IRELAND AND THE UNITED KINGDOM

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**Rationale:** Weight loss (WL) and sarcopenia are common in oncology populations and are associated with negative clinical outcomes including poor tolerance to treatment, decreased quality of life and reduced survival. The numbers of patients with cancer affected by sarcopenia and WL in Ireland and the UK are currently unknown.

**Methods:** A literature search was undertaken to identify reports of the prevalence of WL > 5% and CT-diagnosed sarcopenia. Median rates of sarcopenia and WL > 5% were identified for 14 cancer sites. Incidence and prevalence of each cancer were obtained from national cancer registries of the Republic of Ireland (ROI); Northern Ireland, England, Scotland and Wales (UK). Rates of WL > 5% and sarcopenia in the population were extrapolated from these data.

**Results:** The 14 cancer sites with reported rates of WL > 5% and sarcopenia accounted for 93% of ROI and UK incident cases combined for this period. These sites accounted for 82% of ROI and UK prevalent cases combined for this period. We estimated that across the ROI and UK, at least 86,827 cancer patients are affected by WL > 5% annually and that there are 475,885 cancer survivors who have suffered WL > 5% at some point in their disease trajectory. Furthermore, we estimate that there are at least 162,071 annual cases of cancer patients with sarcopenia in the ROI and the UK. We estimate that there are 892,929 cancer survivors alive who have been affected by sarcopenia during their disease trajectory.

**Conclusions:** This is the first report estimating the burden of WL and sarcopenia across the UK and Ireland. These figures are conservative estimates limited by gaps in the literature. Given the impact of malnutrition on cancer outcomes during treatment, and the long-term impact of sarcopenia on frailty amongst survivors, urgent attention is required to address gaps in access to nutrition care available to cancer patients.

**Disclosure of Interest:** None declared.

#### SUN-PO091

##### NUTRITIONIST DELIVERED QUALITY IMPROVEMENT PROGRAM RESULTS IN SIGNIFICANT REDUCTION IN UNPLANNED HOSPITAL ADMISSIONS AMONG CANCER PATIENTS UNDERGOING CHEMOTHERAPY AND/OR RADIOTHERAPY

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**Rationale:** Chemotherapy and radiation therapy have been associated with increased risk of malnutrition in cancer patients and addressing nutrition needs can result in improved health outcomes. This study aimed to analyze the effects of a nutritionist delivered quality improvement program (QIP) among Indian out-patients undergoing cancer treatment on unplanned hospital admissions.

**Methods:** Data was collected for 80 QIP patients and 70 historical controls. QIP included screening for malnutrition risk on start of treatment, regular consultations with the nutritionists, monitoring and education involving patient and care-giver and initiation of oral nutrition supplements (ONS) for patients who are undernourished or at risk of malnutrition with follow up for 3 months.

The primary outcome measure was the 3-month unplanned hospital admissions during treatment of chemotherapy and/or radiation therapy. The secondary outcome included weight changes from the beginning of the treatment (baseline) to 3 months after starting treatment.

**Results:** 3-months unplanned hospital admission rates were significantly reduced in the QIP group when compared to the control group (37.5% vs 65.7%,  $p < 0.001$ ). Average body weight of QIP patients did not significantly decline from the start of the treatment to 3 months of follow up when compared to statistical decline of body weight in the control group (QIP: Baseline, 60.98 kg; 1 month, 60.68 kg; 3 months, 61.53 kg;  $p = 0.08$ ; Controls: Baseline, 68.23 kg; 1 month, 66.64 kg; 3 months, 65.11 kg;  $p < 0.001$ ). SGA done at baseline revealed that 25% ( $n = 17$ ) of the patients were malnourished and 60% ( $n = 48$ ) were nutritionally at risk. ONS was initiated to 81% ( $n = 65$ ) of patients on the start of the cancer treatment. Compliance of patients on ONS was monitored during the review sessions and was found to be 89% ( $n = 59$ ) in the first month and 77% ( $n = 50$ ) in the third month.

**Conclusions:** Three months unplanned hospital admissions were significantly lowered for out-patients undergoing cancer treatment by the nutritionist-delivered quality improvement program.

**Disclosure of Interest:** None declared.

#### SUN-PO092 ONCOLOGIC PATIENTS, UNDER OR OVER NUTRITION

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**Rationale:** Depending on the etiology of the disease, several forms of malnutrition are present in oncology patients. Nutritional risk assessment is an effective tool to early diagnose nutritional imbalances associated with the disease and with the anticancer treatments.

The aim of the study was to assess nutrition risk in cancer patients using various methodologies.

**Methods:** The study included 57 (22 females, 35 males, mean age 57 y) cancer patients in chemotherapy (QT) treatment. 57% of male patients had head and neck or pulmonary cancer and 50% of woman had breast or ovary cancer. The nutritional risk was determined by Body Mass Index (BMI), categorized by World Health Organization criteria, Malnutrition Universal Screening Tool (MUST) and Patient Generated Subjective Global Assessment (PG-SGA).

**Results:** According to BMI, 14% of the patients were malnourished and 37% obese. Using MUST score 19% of the patients had high malnutrition risk and by PG-SGA 47% needed nutrition intervention. In females, by BMI there was not malnourished cases, by MUST 5% score high risk of malnutrition and by PG-SGA 64% needed nutrition intervention. 63.6% of the woman were overweight or obese. In males by BMI 17% were malnourished, by MUST 29% scored high risk of malnutrition and by PG-SGA 37% needed nutrition intervention. 45.7% of the male patients were overweight or obese. There was a positive association with head and neck cancer and high malnutrition ( $p < 0.001$ ) and a non statistical significant positive association with breast cancer with overweight  $p < 0.1$ .

**Conclusions:** In our sample we observed a considerable high prevalence of high malnutritional risk, especially when using the PG-SGA, and was not positively correlated with BMI criteria of malnourished. Head and neck cancer was associated with higher malnutrition risk and breast cancer, although without statistical significance, with overweight and obesity.

**Disclosure of Interest:** None declared.

#### SUN-PO093 GLIM MALNUTRITION CRITERIA APPLYING DYNAMOMETRY AS A PREDICTING TOOL OF LENGTH OF STAY AND 6-MONTHS MORTALITY IN ONCOLOGICAL INPATIENTS

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**Rationale:** Malnutrition is a very common issue in oncological patients and it is linked to an increased morbimortality. GLIM criteria have been recently proposed to the diagnosis of malnutrition, they must be validated in prospective studies.

Our objective is to determine the prevalence of malnutrition in oncological inpatients with different malnutrition diagnostic tools, as well as to assess its ability to predict length of stay and 6-months mortality.

**Methods:** Prospective study in patients hospitalized in Medical Oncology ward. Subjective Global assessment (SGA) was done and anthropometrical data was gathered. We used two options to assess fat free mass determinants in order to classify patients according to GLIM criteria: 1. Fat free mass index (FFMI), which was calculated by the formulae of Durnin and Siri, and 2. Handgrip strength (HGS) by dynamometry (Jamar).

**Results:** 282 inpatients were assessed, 55.7% male and 44.3% female, with an average age of  $60.2 \pm 12.6$  years and a BMI of  $24.6 \pm 4.9$  kg/m<sup>2</sup>. Average score on HGS was  $26.2 \pm 8.6$  kg in male and  $16.5 \pm 6.7$  kg in female. Average FFMI was  $17.5 \pm 2.4$  kg/m<sup>2</sup> in male and  $15.9 \pm 2.5$  kg/m<sup>2</sup> in female.

According to SGA, 81.4% of the patients were malnourished and applying GLIM criteria malnutrition was detected in 77.6% of the patients.

Average hospital length of stay was  $10.3 \pm 8.3$  days. In patients with severe malnutrition according to SGA, average stay was  $12.1 \pm 8.1$  days vs  $8.2 \pm 9.8$  days in well-nourished ( $p < 0.001$ ); according to GLIM criteria with FFMI,  $11.0 \pm 7.7$  days in malnourished vs  $8.4 \pm 9.9$  in well-nourished ( $p < 0.05$ ); and according to GLIM criteria with HGS,  $11.1 \pm 8.1$  days in malnourished vs  $7.7 \pm 9.1$  in well-nourished ( $p < 0.01$ ). 6-months mortality was 47.9% (135 deaths). In malnourished patients according to SGA, mortality risk was 2.23 times greater than in well-nourished [95% CI 1.14–4.38;  $p = 0.009$ ]. Using GLIM criteria with FFMI, mortality risk was 1.87 times greater than in well-nourished [95% CI 1.01–3.5;  $p = 0.047$ ]. Using GLIM criteria with HGS, mortality risk was 2.72 times greater than in well-nourished [95% CI 1.37–5.4;  $p = 0.004$ ].

**Conclusions:** Both GLIM criteria and SGA are good predictors of hospital length of stay and 6-months mortality in oncological inpatients.

Dynamometry and FFMI (calculated by anthropometrical measurements) are presented as interesting tools to estimate fat free mass when applying GLIM criteria.

**Disclosure of Interest:** None declared.

#### SUN-PO094 THE ROLE OF NUTRITIONAL INTERVENTIONS IN SURGICALLY TREATED PANCREATIC CANCER PATIENTS: COMPARATIVE EFFICACY IN A NETWORK META-ANALYSIS (NMA)

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**Rationale:** Surgery increases the risk of weight loss and sarcopenia in pancreatic cancer (PC) patients. Peri-operative nutritional support may improve recovery and reduce postoperative complications.

**Methods:** A systematic literature review of randomized clinical trials (RCTs) was performed to evaluate the impact of immunomodulating enteral nutrition (IMEN), standard enteral nutrition (EN), parenteral nutrition (PN) or control in reducing postoperative complications in surgical PC patients. Overall, 33 studies were considered. Only studies evaluating nutritional intervention and complications in the peri-operative setting were included. Outcomes of interest were infectious and non-infectious complications. A Bayesian model was applied to conduct NMA comparing the probability of post-operative complications for each treatment and to rank the best intervention arm.

**Results:** Seven RCTs (1,041 patients) were analyzed. In the pairwise meta-analysis, nutritional interventions did not show a significant difference in reducing complications. Odds ratios (OR) for post-operative complications and 95% Credible Interval (CrI) of selected NMA comparisons are reported in the table. Nevertheless, IMEN was ranked as the best intervention in decreasing the rate of post-operative complications. Probabilities of being the best treatment for each arm are reported.

NMA Comparisons	OR (95% CrI)	Intervention	Probability of being the best nutritional intervention
IMEN vs Control	0.37, 95% CI 0.06–2.2	IMEN	51%
PN vs Control	0.43, 95% CI 0.04–4.7	PN	32%
EN vs Control	0.49, 95% CI 0.05–3.9	EN	9%

**Conclusions:** In these indirect comparisons, complications after pancreatic surgery were not significantly reduced by any nutritional intervention. However, we estimated that IMEN might be the most beneficial treatment in surgical PC patients.

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#### SUN-PO095

#### EVALUATION OF PREOPERATIVE SARCOPIENIA IN PATIENTS UNDERGOING SURGERY FOR GASTROINTESTINAL SYSTEM CANCER

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**Rationale:** It has been shown that the incidence of sarcopenia increases in cancer patients and associated with chemotherapy toxicity, postoperative complications and decreased survival. Therefore, evaluation of body composition is becoming increasingly important in these patients. The aim of this study was to evaluate sarcopenia in patients who underwent surgery for gastrointestinal system (GIS) surgery.

**Methods:** Twenty-four patients aged 65 years and older who were admitted to the general surgery outpatient clinic were included in the study. After preoperative comprehensive geriatric assessment, the patients were evaluated with bioelectrical impedance analysis (BIA) and ultrasound (USG). Skeletal muscle mass (SMI) was measured by BIA and gastrocnemius (GK), rectus femoris (RF), rectus abdominis (RA), external oblique (EO), internal oblique (IO) and transversus abdominis (TA) muscle thickness were measured by USG. The cross-sectional area was also evaluated for RF muscle (RF CSA). The diagnosis of sarcopenia was made according to the EWGSOP2 criteria.

**Results:** The median age of the patients was 71.5 (65–87) and 58.3% were female. Thirty seven point five percent of the patients had upper GIS, 54.2% had lower GIS and 8.3% had hepatobiliary system malignancy. The mean SMI value was determined as 10.1 ± 1.9 kg/m<sup>2</sup>. Sarcopenia incidence was 50% in these patients. It was found that 37.5% of these cases had possible and 12.5% had severe sarcopenia. MNA SF scores were similar between sarcopenic and non sarcopenic patients. Handgrip strength of sarcopenic patients was lower than non sarcopenic patients (p = 0.002). Skeletal muscle mass index and 4 m walking speeds were similar between groups. Between measured muscles, RF thickness and RF CSA were found to be thinner in patients with sarcopenia (p = 0.02, p = 0.04, respectively).

**Conclusions:** Sarcopenia is a common health problem in older patients who are planned to undergo cancer surgery. Considering the relationship between possible complications and mortality, precautions should be taken for the management of sarcopenia in these patients.

**Disclosure of Interest:** None declared.



### SUN-PO096 ACCEPTANCE AND COMPLIANCE OF A NEW ORAL NUTRITIONAL SUPPLEMENT IN CANCER PATIENTS – A PILOT STUDY IN CROSS-OVER DESIGN

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**Rationale:** Often, cancer patients cannot meet their nutritional needs through a normal diet. Oral nutritional therapy given as oral nutritional supplements (ONS) is an effective way to stabilize nutritional status in this situation. For better compliance, the offer of different flavors and preparations is crucial. Innovative forms of application of ONS could help to improve compliance and acceptance and avoid invasive nutritional measures. The aim of the present study was to compare the acceptance and compliance of a commercial liquid ONS (LO) and a newly developed, protein-rich, gelled, semi-solid product based on fruit gums (FG) in oncological patients with an increased risk of malnutrition.

**Methods:** Cancer patients with indication for oral nutritional therapy were randomly assigned to LO and FG in cross-over design for 4 weeks (group 1: LO-FG, group 2: FG-LO) with a 1-week wash-out phase. Compliance and acceptance were recorded by ONS diary, MARS-D and sensory questionnaire. Safety monitoring was performed by recording nutrient intake (3-day nutritional protocol), nutritional status (mBCA, seca), performance status (Karnofsky Index, ECOG) and quality of life (EORTC QLQ-C30).

**Results:** Forty patients (45% f, 85% UICC III/IV, Karnofsky Index/ECOG 70/1) were randomized to the study groups. Both the ONS diary ( $p=0.003$ ) and the MARS-D ( $p=0.005$ ) showed significantly higher compliance for the LO compared to FG. The differences were 26.7% and 15.6% respectively. UICC stage, gender, duration of previous oncologic therapy, and recommended amount of ONS appear to have no impact on compliance. Taste, smell and enjoyment of the LO were rated significantly better. Energy and nutrient intake, nutrition and performance status and quality of life remained stable throughout the study.

**Conclusions:** The protein-rich, gelled, semi-solid, fruit gum-based ONS is an innovative formulation that stabilizes energy and protein delivery in cancer patients and can be used to supplement conventional liquid ONS. In order to increase compliance and acceptance, the sensory properties must be further improved.

**Disclosure of Interest:** None declared.

### SUN-PO097 EXAMINATION OF POLYPHARMACY AND NUTRITIONAL STATUS IN CANCER PATIENTS

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**Rationale:** Recently, the state of taking 6 or more medications is called polypharmacy. Cancer patients often take multiple medications to alleviate various symptoms as the disease progression. We analyzed the data of cancer patients collected on nutritionDay at our hospital, and examined the polypharmacy and nutritional status.

**Methods:** We conducted a questionnaire survey on 908 patients on nutritionDay for three years from 2013 to 2015. Of these, 188 patients have cancer, so they are divided into P group with more than 6 drugs and N group with 5 drugs or less. There were 58 in P group and 130 in N

group. We compared and examined the treatment situation and nutrition management method between two groups.

**Results:** Average age is 73.14 years in P group, 69.72 years in N group. The average value of BMI was 21.96 kg/m<sup>2</sup> in P group and 20.63 kg/m<sup>2</sup> in N group. There was no difference in the serum albumin level between P group 3.12 and N group 3.08. Regarding nutrition management, parenteral nutrition was administered in 35.7% of P group and 45.0% of N group. Oral intake was 59.0% in P group and 52.0% in N group. Of 53 patients of stage 4, 15 (28.3%) in P group and 38 (71.7%) in N group. According to the purpose of treatment, 12 (23.1%) of 52 curative treatments, 31 (32.6%) of 95 palliative treatments, and 12 (38.7%) of 31 terminal care were in the P group. The average number of oral medications was 3.0 in the curative treatment patients, 4.1 in the palliative, and 5.4 in the terminal.

**Conclusions:** From the results of this study, the proportion of patients with polypharmacy increased with the progression of cancer.

**Disclosure of Interest:** None declared.

### SUN-PO098 EFFECT OF NRS2002 ON IDENTIFYING MALNUTRITION IN CANCER PATIENTS UNDERGOING RADIOTHERAPY

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**Rationale:** Nutrition Risk Screening Scale (NRS2002) is recommended as a nutrition screening tools by ESPEN. However, we find that many of the low-risk patients with radiotherapy based on NRS 2002 may still have develop malnutrition. This study aims to evaluate the effect of NRS2002 on identifying malnutrition in cancer patients undergoing radiotherapy based on Patient-Generated Subjective Global Assessment (PG-SGA).

**Methods:** The nutritional status of cancer patients before radiotherapy in two tertiary hospitals in Shanghai and Zhejiang province were screened and evaluated by NRS2002 and PG-SGA. The Sensitivity, Specificity, Yoden index, Kappa value and area under ROC curve of NRS2002 were calculated using PG-SGA as a gold standard.

**Results:** A total of 368 cancer patients were enrolled in this study. Among them, 27.1% of the cancer patients had NRS2002  $\geq 3$  points at admission and 35.9% had PG-SGA  $\geq 4$  points. The Sensitivity, Specificity, Accuracy and Yoden index of NRS2002 for screening malnutrition (PG-SGA  $\geq 4$ ) were 37.87%, 87.28%, 69.56% and 25.16%, respectively. The Sensitivity, Specificity, Accuracy and Yoden index of NRS2002 for screening severe malnutrition (PG-SGA  $\geq 9$ ) were 62.06%, 96.18%, 80.16% and 58.35%.

**Conclusions:** NRS2002 has a low sensitivity but a high specificity for malnutrition screening in cancer patients with radiotherapy. Therefore, it is still necessary to carry out nutritional assessment for low nutrition risk cancer patients with radiotherapy, and further nutritional support should be given to those who are in nutrition risk.

**Disclosure of Interest:** None declared.

### SUN-PO099 PREDICTIVE FACTORS OF CATHETER-RELATED BLOODSTREAM INFECTION IN ADVANCED CANCER PATIENTS RECEIVING HOME PARENTERAL NUTRITION

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**Rationale:** Home parenteral nutrition (HPN) is a lifesaving therapy for patients with intestinal failure or dysfunction, long-term

administration of HPN allows patients to survive for prolonged periods of time, improves patient quality, and reduces health care costs. Catheter-related bloodstream infections (CRBSIs) are normally defined clinically as symptoms with a positive blood culture from a central and peripheral catheter, with no other apparent source of infection, while receiving HPN. CRBSIs is a common and serve complication of long-term HPN. CRBSIs may cause significant morbidity and mortality. The aim of this study was to determine the predictive factors of CRBSIs acquired through a central venous catheter for delivery of HPT therapy among the advanced cancer patients in single medical center.

**Methods:** This retrospective study was conducted with advanced cancer patients with intestinal failure or dysfunction who received HPN from April 2002 to December 2018. A total of four-hundred and sixty-three patients was enrolled. Multivariate analysis was used by Logistic regression method.

**Results:** There were 270 males (53.8%) and 193 females (41.7%), with a mean age of  $61.93 \pm 13.23$  years. Of 463 patients, 160 patients (34.6%) were with stage III disease and 303 patients (65.4%) were stage IV disease. Median HPN administration period was 43.0 days (range, 4–728 days). There were 449 patients (97%) to receive venous-port access and 14 patients (3%) were peripherally inserted central catheter. Compounding formulation was 98 patients (21.2%) and 365 patients (78.8%) with commercial formulation. Among these 463 patients, 133 patients (28.7%) have CRBSIs. After univariate and multivariate analyses, the duration of HPN administration (>110 days), cancer stage (stage IV), type of HPN (compounding HPN) and chemotherapy combined with radiotherapy were the predictive factors of CRBSIs [duration of HPN administration (>110 days vs.  $\leq$  110 days: odds ratio (OR), 3.944; 95% confidence interval (CI), 2.157–7.211;  $P < 0.001$ ; cancer stage (stage III vs. stage IV): OR, 2.163; 95%CI, 1.252–3.734;  $P = 0.006$ ; type of HPN (compounding vs. commercial): OR, 2.300; 95% CI, 1.250–4.234;  $P = 0.007$ ; chemotherapy combined radiotherapy (yes vs. no): OR, 11.898; 95%CI, 2.125–66.608;  $P = 0.005$ ].

**Conclusions:** CRBSI is a significant complication in patients receiving long-term HPN. Individualized therapy with a multidisciplinary team in centers with HPN management expertise is required. Careful selection of the catheter type and HPN formulation for each patient is necessary to best meet patient requirements and minimize HPN-related complications. Strict compliance by patients and caregivers with evidence-based instructions together with supervision by well-trained HPN providers is the most effective strategy to prevent CRBSIs.

**Disclosure of Interest:** None declared.

#### SUN-PO100

#### HOME PARENTERAL NUTRITION THERAPY FOR MALNOURISHED UNRESECTABLE/METASTATIC GASTRIC CANCER WITH SALVAGE CHEMOTHERAPY

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**Rationale:** Gastric cancer (GC) is the seventh major cause of cancer-related death in Taiwan. Although significant advances have been made in the surgical techniques and the treatment, salvage chemotherapy remains the major treatment strategy for unresectable/metastatic gastric cancer (GC) patients. Practical and technical advances have simplified safe and convenient use of home parenteral

nutrition (HPN). This study aims to clarify the role of HPN in patients with incurable GC undergoing salvage chemotherapy.

**Methods:** Twenty-five GC patients administrated with HPN were enrolled. A total caloric supplement of 910–1800 kcal/day parenteral nutrition, including 33–60 gm amino acid/day, 120–240 gm glucose/day, 30–60 gm lipid/day and electrolyte, micro-element and vitamin according to the nutritional status of subjects, of which was infused continuously daily in an infusion time ranged between 18 and 24 hours. The nutritional status and laboratory data before the administration of HPN and after HPN at 0.5, 1, 2, 3 months were analyzed.

**Results:** Of 25 patients, there were 15 (60%) males and 10 (40%) females, with a median age of 68 (range, 35–88) years. Median HPN administration period was 135 (range, 16–569) days. 11 (44%) patients and 14 (56%) patients were categorized to ECOG status 1 and 2, respectively. There was a significant improvement of total protein ( $P = 0.008$ ), prealbumin level ( $P < 0.001$ ) and total cholesterol ( $P = 0.023$ ) after 0.5 month of HPN administration. After 1 month, there was a significant improvement of nitrogen balance ( $P = 0.004$ ) and prealbumin level ( $P < 0.012$ ). After 2 months, there was a significant improvement of triglyceride ( $P = 0.018$ ), but inflammation-related cytokines were not significantly altered (all  $P > 0.05$ ).

**Conclusions:** HPN therapy for malnourished unresectable/metastatic GC patients with salvage chemotherapy was feasible and revealed the markedly improvement in nutritional status after 0.5 month of administration without significant alterations of inflammatory cytokines. It is mandatory that early intervention in home parenteral nutrition (HPN) for malnourished unresectable/metastatic GC patients with salvage chemotherapy.

**Disclosure of Interest:** None declared.

#### SUN-PO101

#### DYSGEUSIA IN NON-SMALL CELL LUNG CANCER PATIENTS WITH ANOREXIA

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**Rationale:** Dysgeusia (taste alteration) is a very common symptom reported by patients with lung cancer, and when presented together with anorexia (lack of appetite) are the main reasons to promote the reduction of food consumption and in turn promote the Weight loss and the development of cachexia. Dysgeusia and anorexia can contribute to increase the nutritional risk and increase the toxicity of the treatments. Identifying them opportunely and attending them in a timely manner could have an impact on the improvement of nutritional status, tolerance of the treatments and quality of life.

**Methods:** We evaluated taste alterations with an spanish adapted version of the Taste and Smell Survey in 20 patients with Non-Small Cell Lung Cancer (NSCLC) diagnosed with anorexia and under chemotherapy treatment. In addition, the patients answered a 24-hour recall of food intake. Moreover, we associate the energy intake according with the intensity of taste alterations. This is a preliminary analysis, expecting to collect 84 patients to the final report.

**Results:** Dysgeusia was reported by 85% of NSCLC patients with anorexia. The 60% of the patients reported a moderate intensity of taste alterations. Salt taste change (65%) was the main abnormal taste experiencing by the patients, followed by sweet (45), bitter (30%) and sour (20%). The change in each taste was reported mostly stronger than before.

Variable	Abnormal sense of taste: (n = 20)				p*
	Insignificant n = 3	Mild n = 2	Moderate n = 12	Severe n = 3	
Energy Intake	1255 ± 176	1152 ± 201	1128 ± 301	863.1 ± 358	0.372
%energy requirement	96.1 ± 14	85.7 ± 24.1	77.6 ± 15.3	56.9 ± 24.05	0.064
Protein intake (gr)/ kg weight	1.3 ± 0.3	1 ± 0.8	0.9 ± 0.2	0.6 ± 0.25	0.076

**Conclusions:** Patients with Non-Small Cell Lung Cancer (NSCLC) with anorexia showed a high prevalence of dysgeusia, manifesting mostly with a strong tastes. The energy intake in this sample of patients seems to show a pattern according with the intensity of dysgeusia, between greater intensity of taste alteration lower energy consumption. Complete the sample size is required to draw strong conclusions.

**References:** Patients with non-small cell lung cancer (NSCLC) with anorexia showed a high prevalence of dysgeusia, manifested mainly with an increase in sensitivity to basic tastes. The energy intake in this sample of patients seems to show a pattern of energy consumption according to the intensity of dysgeusia; the greater intensity of taste alteration, lower energy consumption.

**Disclosure of Interest:** None declared.

#### SUN-PO102 DIETARY INTAKE OF CANCER PATIENTS ON CHEMOTHERAPY TREATMENT

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**Rationale:** The aim of this study was to assess nutritional status and dietary intake of cancer patients undergoing chemotherapy.

**Methods:** This analytical cross-sectional observational study was carried out between April and June 2018. Included cancer patients undergoing chemotherapy above 18 years. Nutritional status was assessed with the Patient Generated-Subjective Global Assessment (PG-SGA<sup>®</sup>) and dietary intake was assessed with a 3-day food diary.

**Results:** This study included 42 cancer patients. 38.1% were moderately malnourished and 4.8% were severely malnourished. Dietary intake was characterized by low energy (64,3%), low protein (52,4%), carbohydrates (83,3%), lipids (47,6%), fiber (71,4%), potassium (88,1%), calcium (81%), magnesium (76,2%), iron (52,4%), folic acid (95,2%), vitamin B1 (52,4%), vitamin E (95,2%), vitamin D (100%) and vitamin A (81%). Although, it was verified a high ingestion of mono-disaccharides (76,2%) and saturated fatty-acids (45,2%). It was verified a low inverted correlation between macro and micronutrients intake and nutritional status. However, this correlation was significant between phosphorus intake and nutritional status, i.e., the lower phosphorus intake the worst nutritional status (p < 0.05).

**Conclusions:** The aim of nutritional intervention is to guarantee that nutritional intake supply nutritional requirements of cancer patients, control symptoms with nutritional impact, improve nutritional status and promote quality of life. In this study, 57.1% of patients were well nourished but the majority was lower intake of energy and nutrients. Thus, it's important to have a personalized nutritional intervention during cancer treatment. This study allowed to know the reality of cancer outpatients in a Portuguese Private Hospital, in nutritional status and dietary intake.

**Disclosure of Interest:** None declared.

#### SUN-PO103 SMARTPHONE-BASED CLINICAL RESEARCH FOR EFFECTIVE NUTRITIONAL INTERVENTION IN POSTOPERATIVE BREAST CANCER PATIENTS

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**Rationale:** We investigated the effectiveness of nutritional intervention using smartphones in Korean female patients with postoperative breast cancer and assessed the possible difference between using smartphones or not.

**Methods:** We conducted a prospective study of 58 female patients who underwent surgery for breast cancer between November 2017 and June 2018 at the Department of Surgery in Gangnam Severance Hospital. Physical examination included bioelectrical impedance measurement, dietary changes were checked using the self-food intake record, and quality of life (QoL) was measured with calibrated survey items of QoL.

**Results:** Thirty patients (51.7%, mean age 46.8 ± 5.24 years) were classified as the nutritional intervention group using smartphones and 28 patients (48.3%, mean age 48.39 ± 7.81 years) as the control group not using smartphones. Significant changes were observed in weight, body mass index (BMI), waist-hip ratio, and QoL after 8 weeks compared to the baseline in the nutritional intervention group using smartphones. Weight (1.62 ± 1.74 vs. 1.37 ± 2.36 kg, p < 0.001), BMI (0.64 ± 0.67 vs. 0.54 ± 0.92 kg/m<sup>2</sup>, p < 0.001), and waist-hip ratio (0.02 ± 0.02 vs. 0.01 ± 0.04, p < 0.001) were significantly reduced compared to those in the control group. However, QoL (14.27 ± 18.25 vs. 20.11 ± 20.28, p < 0.001) was higher in the control group.

**Conclusions:** These results suggest that nutritional intervention using smartphones seems to be effective in improving risk factors of breast cancer: weight, BMI, and waist-hip ratio.

**Disclosure of Interest:** None declared.

#### SUN-PO104 EVALUATION OF ENERGY EXPENDITURE BY INDIRECT CALORIMETRY IN A HEMATOPOIETIC STEM CELL TRANSPLANTATION CENTER IN BRAZIL

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**Rationale:** Treatment with hematopoietic stem cell transplantation (HSCT) is often the only therapeutic alternative for myelodysplastic, autoimmune or hemoglobinopathic diseases. During treatment, variations in basal metabolism associated with variations in weight loss such as loss of lean mass are associated with complications and variations in clinical outcome. Aims: To characterize the service sample describing the baseline expenditure measured by indirect calorimetry (IC).

**Methods:** Retrospective study performed at the HSCT clinic of the Clinical Hospital, Medical School, Ribeirão Preto, USP. At the first outpatient appointment with the dietitian, the IC was evaluated, the weight and height data were checked, and the serum C-reactive protein (CRP) was obtained through the electronic medical record; the predicted expenditure estimate data were calculated from the Harris & Benedict equation. Associations between variables were analyzed by



analysis of variance (ANOVA) Pearson's nonparametric correlation test, with  $p < 0.05$ .

**Results:** 11 patients of both sexes were evaluated in a one-year period, with average body mass index (BMI) of  $22.1 \text{ kg/m}^2$ , average baseline measured in 1545 Kcal ICs (an average of  $27 \text{ kcal/kg}$ ) and PCR of  $3.36 \text{ g/dL}$ . A significant difference ( $p = 0.036$ ) was observed between the CRP and diagnostic values, with the median being higher in aplastic anemia ( $6.13 \text{ g/dl}$ ) and lower in multiple sclerosis ( $\text{CR} = 0.04$ ) positive with calorimetry findings ( $p = 0.02$ ) and negatively with energy expenditure  $\text{kg/body weight}$  ( $p = 0.05$   $R = -0.76$ ) with weight and BMI ( $p = 0.05$ ).

**Conclusions:** The findings of this study are preliminary because of sample size limitation, but seem to point to metabolic variations caused by changes in body composition, mainly caused by myotoxic drugs used in pre-transplantation conditioning and serum CRP variations.

**Disclosure of Interest:** None declared.

#### SUN-PO105

##### HANDGRIP STRENGTH AND PERCEPTION OF FATIGUE IN CANCER PATIENTS TREATED WITH PLATINUM DERIVATIVES

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**Rationale:** With the progression of cancer and difficulties in preserving food intake during treatment, it is observed in the patients expressive weight loss, often characterized by loss of muscle mass, often accompanied by complaints of fatigue and loss of quality of life. The aims of this study was to characterize the ponderal evolution, associated to the measure of functionality and fatigue.

**Methods:** a control case study: 22 healthy participants and 21 participants diagnosed with gastrointestinal tract cancer of both sexes between the ages of 18 and 60 formed the control and study groups (CG and SG) respectively and were evaluated with nutritional assessment (weight and height), handgrip strength and fatigue pictogram in 2 moments: before starting treatment (T0) and after 2 cycles of chemotherapy with platinum derivatives (T1). Statistical analysis was performed with mixed model ANOVA, level of significance  $p \leq 0.05$ .

**Results:** The initial average values (T0) of body mass index (BMI), handgrip strength, fatigue pictogram and fatigue impact in daily activities for participants of the CG, were:  $26.9 \text{ kg/m}^2$ ,  $33.5 \text{ kg}$ , 2.4 and 1.7, respectively, and for SG:  $27.2 \text{ kg/m}^2$ ;  $22.6 \text{ kg}$ , 2.2 and 2.9. At T1 the average values in the CG were:  $26.8 \text{ kg/m}^2$ ;  $31.5 \text{ kg}$ , 2.18 and 1.15 and in the SG:  $26.5 \text{ kg/m}^2$ ;  $21 \text{ kg}$ ; 2.5 and 2.4. BMI, handgrip strength and fatigue impact on the performance of daily activities presented a significant difference between the times ( $p = 0.008$ ,  $0.009$  and  $0.006$ , respectively).

**Conclusions:** Changes in body weight and muscular function showed association in this study with the impact of fatigue, which may influence the quality of life and outcome of the treatment of patients on chemotherapy with platinum derivatives.

**Disclosure of Interest:** None declared.

#### SUN-PO106

##### PREOPERATIVE SARCOPENIA AND LYMPHOPENIA HAVE AN ADDITIVE VALUE FOR PROGNOSIS PREDICTION IN LOCALIZED PANCREATIC DUCTAL ADENOCARCINOMA

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**Rationale:** Pancreatic ductal adenocarcinoma (PDAC) is a highly aggressive cancer and surgical resection with adjuvant chemotherapy is the only treatment that can providing long term survival. However, relapse occur in most patients and a better stratification of preoperative therapies is required. Lymphopenia and sarcopenia are two prognostic factors for PDAC.

The aim of this study was to investigate preoperative immunological and nutritional factors including sarcopenia to predict relapse-free survival (RFS) in patients with localized PDAC (LPDAC).

**Methods:** All consecutive LPDAC patients treated with surgical resection at Besancon University Hospital, France, between January 2006 and December 2014 were included. Biological and nutritional parameters were recorded before and after surgery. The association of 24 baseline parameters with RFS was evaluated using univariate and multivariate Cox analyses. Then, a prognostic score was developed.

**Results:** Lymphocyte count and body composition calculation were available for 94 patients.

In multivariate analysis, preoperative lymphopenia and sarcopenia were identified as independent prognostic factors for RFS. We determined three groups with median RFS of 5.6 months (95% CI = 4.3 to 9.6 months) for high risk group, corresponding to patients with lymphopenia; 11.5 months (95%CI = 9.8 to 13.9 months), and 21.2 months (95%CI = 9.9 to 55.3 months), for intermediate- (patient with sarcopenia without lymphopenia), and low-risk groups (no risk factor), respectively ( $P < 0.001$ ).

A new threshold of sarcopenia of  $36.1 \text{ cm}^2/\text{m}^2$  for women and  $45.7 \text{ cm}^2/\text{m}^2$  for men was established to identify two risk groups with a RFS of 11.4 months (95%CI = 8.4 to 13.1) and 28.3 months (95% CI = 3.2 to NA), respectively ( $p < 0.0001$ ).

Preoperative sarcopenia predict the occurrence of postoperative lymphopenia in patients with a preoperative lymphocyte count above  $1,000/\text{mm}^3$  (77.8% versus 22.2%,  $p = 0.0029$ ).

**Conclusions:** Preoperative sarcopenia and lymphopenia are pejorative prognostic factors in LPDAC.

Furthermore, preoperative sarcopenia predicts postoperative lymphopenia, and we actually know that patients with postoperative lymphocyte count  $< 1000/\text{mm}^2$  have the worst prognostic and none of them had long term survival (1).

Sarcopenia is a promising nutritional tool and should be considered in the preoperative evaluation to stratify death risk in patients with LPDAC.

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**Disclosure of Interest:** None declared.

### SUN-PO107 NUTRITIONAL STATUS AND INFLAMMATION MARKERS IN PATIENTS WITH PANCREATIC CANCER UNDER CHEMOTHERAPY

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**Rationale:** The study of the correlation of nutritional status with inflammation markers in patients with pancreatic cancer receiving chemotherapy.

**Methods:** In a sample of 52 patients (27 men) with mean age 68,27±9,45 years with pancreatic cancer nutritional risk was evaluated with Mini Nutritional Assessment Screening Form (MNA-SF) and muscle functionality was evaluated with hand grip dynamometry prior to the initiation of their treatment. Moreover, cytokine levels, namely (IL-6, IL-10, IL-8 and TNFα) were measured at the beginning and after 3 months of treatment.

**Results:** According to the nutritional screening, 32.1% of the patients were found to be malnourished, 42.9% at high risk of malnutrition and only 12.5% were found to be at a normal nutritional status. 15.4% of the patients had normal muscle power while 84.6% of the patients were dynamopaenic. Nutritional status at the beginning of chemotherapy was strongly negatively associated ( $r = -0,747$ ,  $p = 0,009$ ) the increase of the levels of IL-8, while body mass index (BMI) was negatively associated with the increase in the levels of IL-10 ( $r = -0,837$ ,  $p = 0,001$ ) and IL-6 ( $r = -0,707$ ,  $p = 0,001$ ) in the first trimester of the treatments.

**Conclusions:** Malnutrition in patients with pancreatic cancer is highly prevalent. Nutritional status malnutrition risk and BMI seems to be associated with an increase in inflammation markers during chemotherapy.

**Disclosure of Interest:** None declared.

### SUN-PO108 NUTRITIONAL RISK SCREENING, NUTRITIONAL INTERVENTION AND QUALITY OF LIFE OF PATIENTS WITH PANCREATIC CANCER, PRIOR TO THE INITIATION OF CHEMOTHERAPY

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**Rationale:** The aim of the study was the evaluation of nutritional risk, the quality of life and the nutritional intervention in patients with pancreatic cancer before the initiation of chemotherapy.

**Methods:** In a sample of 52 patients (27 men) with mean age 68,27±9,45 years with pancreatic cancer nutritional risk was evaluated with Mini Nutritional Assessment Screening Form (MNA-SF) and muscle functionality was evaluated with hand grip dynamometry prior to the initiation of their treatment. Moreover, the provision of nutritional advice or artificial nutritional support in the past twelve months – enteral or parenteral – was also reported

and quality of life (QoL) was evaluated with EORTC-QLQ-C30 questionnaire

**Results:** According to the nutritional screening 32,1% of the patients were found to be malnourished, 42,9% at high risk of malnutrition and only 12,5% at good nutritional status prior to the initiation of chemotherapy. The percentage of weight loss in the past 3 and 6 months was 23,2 ± 7,0% και 30,0 ± 11,9% accordingly. Only 15,4% of the patients were found to have normal muscle functionality, where 84,6% were found to be dynamopaenic. From the patients found at high risk of malnutrition or were categorized as malnourished 54,7% received nutritional advice in the past year, 2% (1/49) received enteral nutrition and 6% (3/49) parenteral nutrition. The mean QoL score was 55,38 (range 0–100), and it was found to have a trend of positive correlation with the nutritional risk as evaluated MNA – SF ( $r = 0,267$ ,  $p = 0,087$ ).

**Conclusions:** Malnutrition in pancreatic cancer patients was found to be non identified and not treated early enough, something that had a negative impact in the quality of life of the patients. Manysteps should be taken in order to raise awareness in oncologists in order to take early measures against malnutrition in these patients

**Disclosure of Interest:** None declared.

### SUN-PO109 EFFECTS OF WESTERN STYLE OR MEDITERRANEAN DIET ON INSULIN RESISTANCE MARKERS IN FEMALE BRCA1/2 MUTATION CARRIERS (LIBRE STUDY)

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**Rationale:** Mediterranean diet (MedD) appears to have protective effects against sporadic breast cancer (BC). The ongoing randomized LIBRE study examines the impact of a lifestyle intervention comprising MedD on hereditary BC, with the intervention already shown to increase adherence to MedD in LIBRE-1 [1]. In this interim analysis we investigate the possibility that some positive effects may be due to an improved insulin sensitivity.

**Methods:** The intervention group (IG) receives a 1-year program including physical exercise and group sessions on MedD, the control group (CG) only two lessons on healthy lifestyle. Homeostasis model assessment index of insulin resistance (HOMA2-IR) and different clinical composite measures including BMI or waist circumference, blood pressure, fasting glucose and serum lipids are calculated at study entry (SE) and after 12 months (V2) in hitherto n = 422 subjects. Nutrition habits and adherence to MedD are assessed by questionnaires. Statistics: paired t-test, Kendall's tau-b, Mann-Whitney-U.

**Results:** At SE, the mean BMI in the study population was 25.3 ± 5.2 kg/m<sup>2</sup>, age 43.4 ± 10.3 years and HOMA2-IR 1.0 ± 0.73. There were no changes from SE to V2 in fasting insulin, HOMA2-IR, Standl/Biermann, ATP III or IRIS II scores in either study arm. In subjects with BMI ≥ 25 kg/m<sup>2</sup>, negative correlations between adherence to MedD and fasting insulin ( $r = -0.128$ ,  $p = 0.036$ ) and HOMA2-IR ( $r = -0.134$ ,  $p = 0.036$ ) were found at SE. In this subgroup, subjects consuming ≥ 3 portions of nuts per week and those who limit their consumption of red and processed meat to <1 portion per day had lower fasting insulin ( $p = 0.025$  and  $p = 0.015$ ) and HOMA2-IR ( $p = 0.026$  and  $p = 0.025$ ) at SE.

**Conclusions:** No clear effects of the intervention on glucose metabolism are evident in either study arm in this interim analysis of a rather healthy study population. However, overweight subjects appear to benefit from following the MedD by presenting more favorable glucose metabolism parameters. The multiple feedback

interaction between glucose, insulin, glucagon, body fat, blood lipids, nutrition or lifestyle habits and other variables is nevertheless worth to be addressed after study completion. Different risk calculators of insulin resistance, especially in a subgroup of BMI  $\geq 25$  kg/m<sup>2</sup>, will be compared.

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**Disclosure of Interest:** None declared.

#### SUN-PO110

##### BASIC INVESTIGATION ON THE MECHANISMS OF ACTION OF ELEMENTAL DIET ELENTAL® IN ORAL CANCER TREATMENT

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**Rationale:** We have reported the effectiveness of elemental diet (ED) Elental® against oral mucositis due to oral cancer treatment (Support Care Cancer 2016, Mol Clin Oncol 2018). However, enough nutrition administration to patients with oral cancer may provide good nutrition for cancer cells, which results in cancer development. At present, it is still unclear whether ED can exert a beneficial effect than above sacrifice in oral cancer treatment. In the present study, we investigated the mechanisms of onset of ED as well as effectiveness of ED in oral cancer treatment.

**Methods:** We evaluated the efficacy of ED on growth ability, migration ability, expression of pro-inflammatory cytokines including tumor TNF- $\alpha$ , IL-1 $\beta$  and IL-6, and nuclear factor- $\kappa$ B (NF- $\kappa$ B) in human keratinocytes (HOK and HaCaT) and human oral squamous cell carcinoma cell (HSC2) by MTT assay, Western blotting and ELISA. In addition, we examined the ED-mediated inhibitory mechanisms of oral mucositis by microarray analysis and network analysis.

**Results:** Our results indicated that ED promoted the growth and migration of malnutrition HOK. In addition, ED inhibited the nuclear transition of p65 NF- $\kappa$ B is known to regulate inflammatory cytokine expression in the keratinocytes. Moreover, ED reduced the expression or production of TNF- $\alpha$ , IL-1 $\beta$  and IL-6 significantly ( $P < 0.01$ ). Furthermore, ED was implicated in the proliferation and survival of HOK through the integrin-mediated activation of ERK, and that ED induced apoptosis of HSC2 through the induction heat shock protein via the activation of unfolded protein response.

**Conclusions:** These findings suggested that ED might add stress to cancer cells, and give growth stimulation to normal cells. It was also suggested that the inhibitory mechanisms of mucositis aggravation by ED might be involved in the promotion of proliferation and migration of oral mucosal cells, the suppression of pro-inflammatory cytokine's expression through inhibition of NF- $\kappa$ B, and the maintenance of proliferation and survival of oral mucosal cells through the integrin-mediated activation of ERK.

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**Disclosure of Interest:** None declared.

#### SUN-PO111

##### BODY COMPOSITION CHANGES EVALUATED BY BIOELECTRICAL IMPEDANCE IN WOMEN WITH CERVICAL CANCER UNDER CHEMORADIO THERAPY TREATMENT

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**Rationale:** Chemo-radiotherapy is the standard treatment in locally advanced stages. The treatment effects are observed in clinical manifestation as anorexia, nausea, vomiting, weight loss, alterations in immune function, and body composition. Accelerate loss of fat-free mass and skeletal muscle are independent predictor of severe toxicity cancer treatment and associated with a worse prognosis.

**Methods:** Longitudinal study was performed in 91 women with locally advanced cervical cancer IB2-IVA older than 18 years old were included. Chronic kidney disease, lupus, HIV was excluded. Body composition was evaluated with bioelectrical impedance. A repeated measure ANOVA was performed to evaluate body composition changes before, baseline, during the treatment at week 3, and at week 9 after treatment.

**Results:** The mean age was 48.7  $\pm$  14.4, and mean weight 63.2  $\pm$  11.7. During the follow-up we observed a statistics significance decreased in body weight (64.72  $\pm$  11.76, 63.75  $\pm$  11.23, 61.8  $\pm$  11.4, 59.01  $\pm$  11.58,  $p < 0.001$ ); Body Mass Index (27.93  $\pm$  4.83, 25.92  $\pm$  8.06, 23.15  $\pm$  10.48, 17.41  $\pm$  12.80,  $p < 0.001$ ); Body Cell Mass (23.5  $\pm$  3.4, 23.0  $\pm$  3.5, 22.4  $\pm$  3.4, 22.3  $\pm$  4.2,  $p = 0.043$ ); phase angle (5.51  $\pm$  0.79, 5.6  $\pm$  0.78, 5.4  $\pm$  0.78, 5.0  $\pm$  0.93,  $p < 0.001$ ); hand grip strength (20.83  $\pm$  4.83, 20.62  $\pm$  5.27, 20.9  $\pm$  4.99, 19.0  $\pm$  5.1,  $p < 0.001$ ). However not difference were observed in muscular mass index and fat-free mass. Also quality of life score decreased (66.5  $\pm$  28.7, 51.05  $\pm$  39.41, 36.63  $\pm$  47.11, 33.03  $\pm$  49.36,  $p < 0.001$ ).

**Conclusions:** Women with cervical cancer had a deteriorated body composition and quality of life due to chemoradiotherapy treatment. Which could have negative implications in prognosis.

**Disclosure of Interest:** None declared.

#### SUN-PO112

##### NUTRITIONAL AND BODY COMPOSITION CHANGES DURING RADICAL TREATMENT FOR LOCALLY ADVANCED HEAD AND NECK CANCER (LA-HNC) PATIENTS

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**Rationale:** We aim to evaluate body composition (BC) and nutritional changes that occur throughout radical treatment for LA-HNC patients. We also aim to compare these changes in patients undergoing chemoradiotherapy (CRT) vs bioradiotherapy (BRT).

**Methods:** This is a longitudinal retrospective single center study of a cohort of patients diagnosed with LA-HNC that underwent treatment with induction chemotherapy (iCT) followed by CTR or BRT. At diagnosis BC was measured by analyzing a single slice at the level of L3 of a PET/CT scan. This technique was repeated 3 months after finishing the treatment. All patients received nutritional assessment at diagnosis and nutritional support throughout the treatment as needed.

**Results:** A total of 40 patients were included. Patients were mainly men (38, 95%) with a mean age of 56.8 years (SD 7.92) and oropharynx as the primary tumor (19; 47.5%) diagnosed in advanced stages (IVb: 21, 52.5%). At diagnosis 45% (18) showed symptoms that interfere with oral feeding: anorexia 12.5% (5), dysphagia 32.5% (13) and odynophagia 37.5% (15). Baseline malnutrition was 37.5% (n = 15) with 7 (17.5%) severely malnourished. All patients received dietetic counseling by an oncology dietitian, 10 patients (25%) added nutritional supplements and 5 patients (12.5%) needed nasogastric tube due to dysphagia G3. The cut-points for skeletal muscle index (SMI) classified 7 (17.5%) patients as sarcopenic before starting the iCT but only 2 were malnourished. Sarcopenic obesity (BMI  $\geq$  25 kg/m<sup>2</sup>) was shown in 2/16 obese patients. Sarcopenia also increased from 17% to 40% (p = 0.001) decreasing the SMI from 51.5 cm<sup>2</sup>/m<sup>2</sup> to 47.3 cm<sup>2</sup>/m<sup>2</sup> (p < 0.001; 95% CI 2.52; 5.85). During the oncoespecific treatment, total adipose tissue (TAT) was significantly reduced (p < 0.001; 95% CI 30.85; 103.38) at expenses of visceral adipose tissue (VAT) mainly (P < 0.001; 95% CI 25.25; 73.75). There was no significant difference between patients undergoing CRT or BRT (p = 0.506).

**Conclusions:**

- Significant nutritional and BC changes occur during radical treatment for LA- HNC patients
- Malnutrition and sarcopenia increase along with the treatment
- There are no significant changes in BC between patients undergoing CRT and BRT

**Disclosure of Interest:** None declared.

**SUN-PO113**

**INVESTIGATION OF THE GUT MICROBIOTA COMPOSITION AND ACTIVITY IN ACUTE MYELOID LEUKEMIC PATIENTS: FIRST CLINICAL RESULTS OF THE MICROAML STUDY**

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**Rationale:** The gut microbiota, a key regulator of host metabolism and immunity, is affected in preclinical models of leukemia and cachexia. Reversing these changes in the gut microbiota can provide benefits in terms of muscle mass loss and quality of life, among others. However, the translational value of this work is unclear.

**Methods:** The MicroAML study is a multi-centric, prospective, observational study. Its primary objective is to assess the composition and activity of the gut microbiota in patients diagnosed with acute myeloid leukemia (AML) (n = 30) in relationship with the patients' food habits and cachectic hallmarks (e.g. appetite, muscle strength, body composition). Biological samples and clinical data are collected before any therapeutic intervention, after the first cycle of chemotherapy and 4 weeks later.

**Results:** Currently, 20 patients have completed the study. Compared to BMI-, sex- and age-matched control subjects, AML patients do not show at diagnostic significant difference in body composition, quality

of their diet and muscle strength. In these patients, blood parameters (i.e. CRP, glycemia and albumin) are altered, as an early sign of metabolic alterations. After the first cycle of the chemotherapy, AML patients display a decrease in BMI (due to muscle mass loss) as well an increased occurrence of anorexia and diarrhea. Gut microbiota composition and activity will be analyzed, once the recruitment is completed, using shotgun metagenomics and <sup>1</sup>H-NMR metabolomics, respectively.

**Conclusions:** Our first results show early signs of metabolic alterations in AML patients at diagnostic, with the development of overt cachexia after the first cycle of chemotherapy. Whether these signs are related to changes in gut microbiota composition and activity will be investigated. ClinicalTrials.gov Identifier: NCT03881826

**Disclosure of Interest:** None declared.

**SUN-PO114**

**VISCERAL FAT ASSESSED BY THIRD LUMBAR VERTEBRA (L3)-TARGETED CT AFFECTS SURVIVAL AND RECURRENCE AFTER CURATIVE LIVER RESECTION FOR INTRA HEPATIC CHOLANGIOCARCINOMA (ICC)**

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**Rationale:** Body composition (BC) was identified to be independently associated with poor prognosis in hepatocellular carcinoma. Measuring visceral fat (VFA), subcutaneous fat (SCFA), intramuscular fat (IMFA) and muscle mass areas (MMA) on computed tomography (CT) is a simple tool to evaluate body composition.

**Aim:** To evaluate the impact of body composition in patients who underwent liver resection for ICC and to assess the prognostic impact on patients' survival and recurrence.

**Methods:** All consecutive patients who underwent liver resection for ICC between 2004 and 2016 and who had available preoperative CT scan were included. BC measurement was performed at the transversal level of the L3 by one single non-radiologist operator with the ImageJ software with a threshold range between -29 and +150 corresponding to muscle density and between -190 and -30 corresponding to fat density. Low MMA was defined as less than 38.5 cm<sup>2</sup>/m<sup>2</sup> in females and 52.4 cm<sup>2</sup>/m<sup>2</sup> in males. Univariate and multivariate analysis for overall survival (OS) and disease-free survival (DFS) were realized using the Cox model.

**Results:** 102 patients were included. 74% men, median age 67 yrs, 82% ASA score  $\geq$  2. 61% had low MMA. Median IMFA was 2030,19 mm<sup>2</sup>, VFA was 14890,19 mm<sup>2</sup>, SCFA was 14278,7 mm<sup>2</sup>. On multivariate analysis, VFA was found to be an independent predictor of OS (Hazard ratio (HR) = 1.02 [95% confidence interval (CI), 1.01–1.02], p < 0.0001) and DFS (HR = 1.02 [1.01–1.03], p = 0.0003). Pulmonary complications (HR = 16.63 [4.30–64.33], p < 0.0001), sepsis (HR = 2.46 [1.30–4.63], p = 0.0055), per operative transfusion (HR = 2.07 [1.14–3.73], p = 0.0161), more than one tumor (HR = 2.29 [1.23–4.24], p = 0.0086) were also found to be associated with a poor OS. Perinervous invasion (HR = 3.29 [1.75–6.19], p = 0.0002), sepsis (HR = 3.75 [1.81–7.74], p = 0.0003), more than one tumor (HR = 2.42 [1.28–4.60], p = 0.0068) were also found to be associated with a poor DFS.

**Conclusions:** VFA is an independent prognostic factor of poor OS and DFS in European patients with resectable ICC. Low MMA, IMFA and SCFA were not found to be prognostic factors.

**Disclosure of Interest:** None declared.

### SUN-PO115 ANALYSIS OF SURVIVAL AND PREDICT FACTORS OF SURVIVAL IN PATIENTS ON HOME PARENTERAL NUTRITION

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**Rationale:** Home parenteral nutrition (HPN) might prolong survival in incurable cancer patients beyond the usually expected time span; moreover, HPN is the mainstay of treatment for patients with intestinal failure. The aim of this study was to investigate the predict factors of survival for patients undergoing HPN.

**Methods:** Five-hundred and twenty-seven patients receiving HPN were enrolled between April 2004 and December 2018. The study endpoint was either the end of weaned-off HPN or death on HPN. Multivariate Cox regression analysis and Kaplan Meier survival curves was used for the statistical analysis.

**Results:** There were 305 (57.9%) males and 222 (42.1%) females, with a mean age of 60.98 ± 15.11 years. Of 527 patients, 475 (90.1%) patients were with malignancy and 52 (9.9%) patients were non-malignant disease. Median HPN administration period was 97.25 (range, 1–3782) days, with the median overall survival (OS) of 2.0 months (1.66–2.33 months). Low serum albumin level (<3.5 g/dl) was significantly correlated with a shorter OS than normal serum albumin level (1.0 vs. 3.0 months,  $p = 0.002$ ). High serum C-reactive protein (CRP) level had an inverse correlation with OS (1.0 vs. 2.0 months,  $p < 0.001$ ). Moreover, Non-cancer patients associated with better OS (5.0 vs. 2.0 months,  $p < 0.001$ ). Kaplan-Meier survival plots depicted a worse prognosis of HPN if the low serum albumin level ( $p = 0.002$ ), malignancy ( $p < 0.001$ ) and high serum CRP level ( $P = 0.002$ ).

**Conclusions:** The use HPN in clinical care is trend of treatment. Individualized therapy with a multidisciplinary team in hospital with HPN expertise is mandatory. Low serum albumin level and high serum CRP level may assist to predict those who are likely to have a worse OS on HPN.

**Disclosure of Interest:** None declared.

### SUN-PO116 FAT QUALITY CORRELATES WITH PROGNOSIS OF ESOPHAGEAL CANCER

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**Rationale:** Sarcopenia and weight loss carry a bad prognosis in esophageal cancer (EC). We studied retrospectively the impact of body mass composition (BMC) on the patient' outcome in EC.

**Methods:** CT-based BMC was evaluated at diagnosis in 152 locally advanced EC. For 50 patients (33%) having undergone a neoadjuvant treatment (chemo- or chemoradiotherapy), a second preoperative CT scan was analyzed. The index (area/height<sup>2</sup>) of skeletal muscle (SMI), subcutaneous (SFI) and visceral fat (VFI) was delineated on two adjacent slides at the third lumbar vertebra level by two independent

investigators using PLANET ONCO<sup>®</sup> software (DOSIsoft, France). Tissue quality was measured by assessing the mean density of each area. Survival was calculated from date of baseline CT-scan.

The difference between the two timepoints were calculated for the indexes and the densities as delta ( $\Delta$ ).

The sex-specific median of each BMC parameter was used as a threshold to separate patients into high and low group.

Sarcopenia was defined following the criteria of Prado *et al.* (Lancet Oncol, 2008), while high and low BMI were defined based on the median.

**Results:** Interobserver correlation was excellent for all BMC parameters measured ( $r = 0.94$  to  $0.99$ ). We confirmed that patients with sarcopenia had a poorer prognosis (HR 1,72 [95% CI 1,11–2,65],  $p = 0.01$ ). At baseline, patients with low VFI showed worse prognosis compared to patients with high VFI (HR 1,56 [95% CI 1,01–2,40],  $p = 0.04$ ). Remarkably, high subcutaneous fat density (SFD) (HR 2,22 [95% CI 1,43–3,42],  $p = 0.0003$ ), as well as high visceral fat density (VFD) (HR 1,73 [95% CI 1,12–2,66],  $p = 0.01$ ), also distinguished patients with poor outcome. In contrast, low BMI was not correlated with patient prognosis (HR 1,2 [95% CI 0,78–1,9],  $p = 0.4$ ).

SMI ( $p = 0,0006$ ), SFI and VFI ( $p < 0,0001$ ) decreased along time and treatment. Interestingly, a gain in VFI did not affect patient prognosis (HR 1,6 [95% CI 0,77–3,5],  $p = 0.19$ ), while patients who gained in SFI showed a better outcome (HR 0,43 [95% CI 0,22–0,85],  $p = 0.01$ ). In contrast,  $\Delta$ SFD showed no prognostic value (HR 1,6 [95% CI 0,8–3],  $p = 0.16$ ), while patients who gained in VFD displayed a poor outcome (HR 2,38 [95% CI 1,22–4,64],  $p = 0.007$ ).

**Conclusions:** These results confirm the prognostic value of BMC assessment, although the cohort needs to be extended to study the impact of treatment on BMC parameters. This study questions the fundamental mechanism of density variation in adipose tissue in EC but also in other cancers.

### Reference

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**Disclosure of Interest:** None declared.

### SUN-PO117 EVALUATION OF BODY MASS AND BODY COMPOSITION AMONG WOMEN TREATED FOR BREAST CANCER DURING TREATMENT

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**Rationale:** Breast cancer is the most frequent type of cancer in women and the second leading cause of death. The risk of breast cancer depends on many factors including physical exercise and eating habits. Obesity is a known risk factor for breast cancer and many other types of neoplasms. The correlation between body weight (bw) and treatment efficacy measured by the patients' outcomes has also been proven. Proper nutrition and physical activity determine normal bw and the appropriate level of body fat.

**Methods:** This prospective study aimed to evaluate the impact of oncological diagnosis and therapy on bw, body mass index (BMI), and body composition in women treated for breast cancer. The study group included 60 consecutive patients aged 34–81 years (median 57.5) treated in two oncological centers. In all patients, after obtaining the informed signed consent, bw and composition were analyzed with bioelectrical impedance (body composition analyzer Tanita BC 420MA). The waist-hip ratio (WHR) was calculated using a standard mathematical formula. The measurements were conducted at four time points: at baseline – before oncological treatment (chemotherapy

and radiotherapy), during treatment (two to four months after the first measurement), during the follow-up (two and six months after finishing therapy).

**Results:** At baseline, excessive body weight (BMI > 25 kg/m<sup>2</sup>) was found in 33 patients (55%), the average BMI was 27.4 (range 16.4–48.2; median 25.9). Body fat ≥30% (mean 34.6%) was found in 45 patients (75%). The healthy body fat was found in 26 patients (normal range 21–33% age 20–39; 23–34% age 40–59; 24–36% age 60–79). The mean WHR for the whole group was 0.86, while in women with excessive body fat the median WHR was 0.89. There were significant differences in bw and body fat between the first and the fourth measurements, but not in WHR. The increase in bw correlated with increased body fat. There were no correlations between any of the analyzed factors and the stages or histopathological differentiation of cancer.

**Conclusions:** Excessive body weight, increased levels of total fat, increased WHR confirm that overweight and obesity are prevalent in breast cancer patients. Moreover, body weight and body fat significantly increase after the oncological treatment. Dietary intervention is a must to protect women treated for breast cancer against excessive body fat/weight and maintain a healthy weight.

**Disclosure of Interest:** None declared.

#### SUN-PO118

##### INFLUENCE OF NUTRITIONAL STATUS INDEXES ON OUTCOMES IN PATIENTS UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION

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**Rationale:** Several analysis have assessed that both underweight and very obese adults patients subjected to hematopoietic stem cell transplantation (HSCT) have worse outcomes but few studies are focussed on other nutritional parameters. We aimed to assess the value of anthropometric indexes and serum albumin as predictors for one-year follow-up outcomes in HSCT patients in a cohort without extreme values of body mass index (BMI).

**Methods:** A retrospective analysis was conducted. Data from patients with hematological malignancies subjected to HSCT and who received specialized nutritional support during their first transplantation were taken from the electronic medical record. Nutritional status was categorized based on BMI, percentage of weight loss (PWL) and albumin level. Endpoints included in-hospital mortality, overall mortality and need for assistance in an emergency ward or hospitalization from day 0 after discharge to +180 and from day +181 to +360.

**Results:** 33 patients were evaluated. 39.4% had hypoalbuminemia (albumin <3.1 g/dL). All patients received nutritional support. Mortality rate during hospital stay was 51.5%. PWL >5% was linked to a higher rate of mortality during HSCT (81.8% vs 35%; p=0.04). Hypoalbuminemia was more frequently found among patients who died during hospitalization as well as in those who required assistance in emergency wards in period day 0 after discharge to +180, but only the second finding reached statistical significance (p=0.8 and p=0.02, respectively). No other differences were found according to any nutritional index in outcomes at days +180 to +360.

**Conclusions:** Weight loss higher than 5% influences on early mortality rather than BMI or albumin levels in adult patients undergoing HSCT without extreme values of BMI. Albumin is postulated as a good predictor for short-term clinical outcomes. Further studies with a larger number of patients are ongoing in our centre to clarify this term.

**Disclosure of Interest:** None declared.

#### SUN-PO119

##### IMPACT OF NUTRITIONAL SUPPORT AND COUNSELING DURING CHEMOTHERAPY ON THE QUALITY OF LIFE OF OVARIAN CANCER PATIENTS. PRELIMINARY RESULTS FROM A PROSPECTIVE STUDY

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**Rationale:** Quality of life is an emergent topic in cancer therapy. To evaluate the impact of nutritional support and counseling delivered during chemotherapy session on the quality of life of patients affected by ovarian cancer.

**Methods:** A prospective, observational pilot study was performed from September 2017 to June 2018, in women affected by ovarian cancer during the first cycle of chemotherapy with platin and taxol-based drugs. Enrolled patients received, during each chemotherapy session, a bag containing 50 g of sugar free candied ginger, a sandwich and a cracker made with ancient Italian Sicilian, stone ground wheat (*Timiliadurum* organic wheat), organic olive oil, organic vegetables, sugar free vegan yeast, sunflower seeds and untreated lemon peel, 5 organic almonds from the 'Alta Murgia National Park (Italy)' or almond from Avola (Italy), and 50 g of organic Peruvian fresh ginger root. Clinical Nutritionists and Dietitians organized two meetings per month for six months offering nutritional counseling during chemotherapy sessions. At the first visit, both the EORT Quality of Life Questionnaire (QLQ-C30) and the 'Quality of Life and Nutrition Questionnaire' (QoL-NQ) were administered to all patients enrolled. Both questionnaires were repeated at the end of the study period. Data collected were evaluated with a paired t-test. A p<0.05 was considered statistically significant.

**Results:** 82 patients were enrolled, and 75 patients completed the study. Mean age was 59 ± 17 years. Each patient accepted to participate at least in one meeting a month and at least in three meetings in total. QLQ-C30 increased from 60.9 ± 21.1 to 64.7 ± 19.9 (p = 0.04); moreover, both the emotional function score and nausea and vomiting score improved. The QoL-NQ increased from 128.2 ± 22.0 to 135.1 ± 19.4 (p = 0.03).

**Conclusions:** Nutritional support during chemotherapy may enhance the quality of life in ovarian cancer patients. Structured planning to ameliorate the hospital's food and nutritional counseling should be advisable.

**Disclosure of Interest:** None declared.

## Nutrition and chronic disease I

#### SUN-PO120

##### PATIENT PREFERENCE AND ACCEPTABILITY FOR READY TO DRINK VERSUS POWDERED ORAL NUTRITIONAL SUPPLEMENTS

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**Rationale:** Oral nutritional supplements (ONS) are an evidence-based strategy to manage malnutrition<sup>1</sup>, however little is known about



patient preferences to the types of ONS available. This survey, in older patients who had recently been prescribed both ready to drink ONS and powdered ONS were asked to rate both products.

**Methods:** Fifty patients (50–73 y, 58% male, mean BMI  $22 \pm 3$  kg/m<sup>2</sup>), with a range of diseases including GI, COPD, Stroke and Cancer, residing in their own home, whose prescriptions were recently changed either from a ready to drink, energy dense, low volume (125 ml) ONS (variety of manufacturers), to a powdered ONS (reconstituted to >230 ml; variety of manufacturers) or vice versa, rated both products (convenience, consistency, mouth feel, thickness, taste, ease of use, compliance and overall preference) on a Likert scale (1 very poor – 5 excellent) via electronic questionnaire. Statistical analysis was undertaken using SPSS v23, including binomial (compliance), paired t-test (preference) and Wilcoxon signed rank tests, results reported as mean $\pm$ SD.

**Results:** Patients significantly preferred the ready to drink ONS (70%), to the powdered ONS (30%) ( $p=0.007$ ) and reported a significantly greater compliance with the ready to drink ONS (73% v 67%;  $p=0.031$ ). Patients reported the ready to drink ONS was significantly more convenient ( $4.4 \pm 0.79$  v  $3.6 \pm 0.99$ ;  $p=0.000$ ); with a better consistency ( $4.0 \pm 1.0$  v  $3.6 \pm 0.95$ ;  $p=0.017$ ) and was easier to use ( $4.4 \pm 0.92$  v  $3.7 \pm 1.15$ ;  $p=0.001$ ) and prepare ( $4.4 \pm 0.86$  v  $3.4 \pm 0.97$ ;  $p=0.000$ ). There were no differences between the types of ONS in terms of thickness, mouth feel, and taste.

**Conclusions:** This survey suggests that patients prefer ready to drink ONS to powdered ONS and compliance is significantly better. A larger survey with an assessment of outcomes is required. Patient preferences and ability to use ONS should be considered when making evidence-based decisions on nutrition support.

#### Reference

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**Disclosure of Interest:** A. Cawood Other: Works part time for Nutricia Advanced Medical Nutrition, E. Walters: None declared, T. Smith: None declared, R. Stratton Other: Works part time for Nutricia Advanced Medical Nutrition.

#### SUN-PO121

##### ADHERENCE TO THE MEDITERRANEAN DIETARY PATTERN IN RELATION TO CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A CASE CONTROL STUDY

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**Rationale:** Recent evidence suggests there is an association between dietary patterns and lung function.<sup>1</sup> The purpose of this study was to examine the adherence to the Mediterranean Dietary Pattern among COPD patients in comparison to subjects without COPD.

**Methods:** A case control study constituting 32 COPD patients consecutively hospitalized with acute exacerbation and 40 patients without COPD. To estimate habitual food and alcohol intake all participants filled out a validated for the Greek population food-frequency questionnaire (FFQ), which included 75 items (foods and beverages commonly consumed in Greece and dietary habits)<sup>2</sup> Adherence to the Mediterranean diet was assessed using a Mediterranean diet score, the MedDietScore, and subjects were classified into tertiles according to individual adherence scoring. Weight, height, mid-upper arm circumference (MUAC), waist circumference (WC), handgrip strength and body composition measurements were taken by a trained dietitian.

**Results:** The mean age of participants was 52.3 years. There was a negative correlation between WC and MedDietScore ( $r=0.336$ ,  $p<0.001$ ). Average smoking in the COPD group was about 33.5 pack-years. Significant differences were found for MedDietScore score between patients with COPD and control subjects ( $30.8 \pm 3.6$  vs  $33.4 \pm 3.8$ ,  $p=0.02$ ). Mean fruit, vegetable, whole wheat cereals (serving/1000 kcal/day) and dietary fiber (gr/day) intake were lower in patients with COPD compared to control subjects (2.1 vs 2.9, 2.2 vs 2.7, 1.3 vs 2.2, and 11.1 vs 17.2, all  $p<0.05$ , respectively).

**Conclusions:** We observed that adherence to a Mediterranean dietary pattern among patients with COPD was significantly lower compared to the control group.

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**Disclosure of Interest:** None declared.

#### SUN-PO122

##### ANTIOXIDANT EFFECTS OF HERBAL MIXTURE INFUSION (HORCHATA) ON CIGARETTE SMOKERS: EX VIVO STUDY

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**Rationale:** The Horchata drink is a popular herbal tea infusion, normally ranging from 16 to 32 locally-produced plants, has been consumed in the province of Loja, located in the southern inter-Andean region of Ecuador, since colonial times. However, there are few studies that analyze the chemical composition and biological effects. Thus, in this study we determine the phytochemical composition and the protective effect of the horchata infusion against oxidative damage in smokers.

**Methods:** The characterization of phenolic acids, flavonoid and anthocyanins were performed by HPLC-DAD/ESI-MSn. This study was carried on erythrocytes and plasma from 20 smokers and 20 non-smokers. The lipid profile and the enzymatic activity of catalase and GSH was determined in plasma, while the spontaneous hemolysis was determined in erythrocytes. Statistical analysis was performed using SPSS 22.0.

**Results:** Caffeoylquinic acids, flavones and flavonols (mostly quercetin glycosides) were prominent in the extract. On the other hand, no significant differences were observed in the lipid between the smokers and non-smokers. The spontaneous hemolysis was significantly higher ( $P<0.05$ ) in smokers compared to non-smokers after 5 h. Furthermore, when erythrocytes were incubated with the horchata extract in the smokers group, the spontaneous hemolysis was significantly lower ( $P<0.05$ ) compared to the not-treated group. The catalase and GSH activity was improved in both groups after incubation with horchata extract.

**Conclusions:** The horchata extract reduce the oxidative damage in the smokers erythrocytes, improving the spontaneous hemolysis as well as improve the activity of the antioxidant enzymes in plasma.

**Disclosure of Interest:** None declared.

**SUN-PO123****PLASMA BAIBA LEVELS IN HEMODIALYSIS AND ITS ASSOCIATION WITH BODY COMPOSITION AND PHYSICAL ACTIVITY CHANGE: A LONGITUDINAL STUDY**

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**Rationale:** Low physical activity is frequent in end stage renal disease. We evaluated the longitudinal change in physical activity and its barriers in hemodialysis (HD) patients and the association between the patterns of physical activity change, body composition, and beta-aminoisobutyric acid (BAIBA), as circulating myokine.

**Methods:** HD patients were considered in a 24-month follow-up. We assessed overtime the change of physical inactivity and its barriers, body composition, muscle strength and plasma BAIBA levels. Parametric and non-parametric analyses were performed, as appropriate.

**Results:** 49 patients were studied at baseline, 39 completed the first-year follow-up, and 29 completed the second year. The barrier 'reduced walking ability' was more frequent in inactive patients with respect to active at month 12 ( $P = 0.003$ ) and at month 24 ( $P = 0.05$ ). At month 12, active patients had higher intracellular water (ICW) ( $P = 0.001$ ) and cellular mass ( $P < 0.001$ ), as well as at month 24 ( $P = 0.012$ ,  $P = 0.002$ ; respectively). A significant reduction in ICW was shown at month 12 ( $P = 0.011$ ) and 24 ( $P = 0.014$ ) in all patients. At month 24, a correlation was seen between muscle strength and ICW ( $r = 0.51$ ,  $P = 0.005$ ) and plasma BAIBA levels were higher among active patients with respect to inactive ( $P = 0.043$ ). Normalizing BAIBA per body mass index, we found it lower with respect to baseline ( $P = 0.004$ ), as well as after correcting per ICW ( $P = 0.001$ ), as marker of muscle mass.

**Conclusions:** A high prevalence of physical inactivity persisted during a 24-month follow-up in this cohort, associated with a decline in markers of muscularity and with reduced plasma BAIBA levels.

**Disclosure of Interest:** None declared.

**SUN-PO124****STUDY OF ADHERENCE TO TREATMENT WITH COMMERCIAL THICKENER IN A POPULATION WITH LIQUIDS DYSPHAGIA**

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**Rationale:** There are not many published data on adherence to treatment with commercial thickener in patients with dysphagia.

**Methods:** A year descriptive-prospective study (2018). Randomized patients were chosen from our database of delivering thickener (875) and called every 3 months. General variables: age, residence, diagnosis and information obtained from a telephone questionnaire related to adherence: Appropriate thickener use (ATU) (according to indicated treatment) and compliance (overall intake). Diet and liquid intake were included.

**Results:** Sample of 202 patients. Median age 84.9 [22.8–103.4] years; 58.4% female. Residence: 43.10% home, 56.9% nursery homes (NH). Main base diagnosis: Neurology 92%. A correct ATU was made in 41.6%, 22.3% had a completely misused and 32.2% a moderate ATU. Changes in ATU occurred in 12.41%(32), with improvement in 40.6%(13/32) and worsening in 59.4%(19/32). Regarding compliance, 47.5% did it well/correctly, 25.7% had poor compliance and 26.2% moderate. Changes in compliance occurred in 14.8%(30) patients, with improvement in 50% (15). There were no differences among residence, education or the

length of thickener use for both parameters. The main reasons for non-compliance were: dislike of product 58.5%, perception of improvement 13% or no specific reasons 28%. Type of diet: pureed (P) 66.3%; soft diet (SD) 3%, mixed (P&SD) 21.3% and normal 9.4%. Only 7.4% changed their diet. At home 35,6% had P&SD diet vs 10,4% at NH,  $p < 0,05$ . At NH 85% of diets were P. Inadequate water intake in 50%.

**Conclusions:** Half of population studied does not fulfill with thickener treatment. Urge to develop new strategies to improve adherence to thickener treatment and be aware of diets and water intake in dysphagia.

**Disclosure of Interest:** None declared.

**SUN-PO125****HOME PARENTERAL NUTRITION IN PATIENTS WITH TYPE III INTESTINAL FAILURE. PATAGONIAN EXPERIENCE**

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**Rationale:** Home parenteral nutrition (HPN) is a safe and effective treatment for type III intestinal failure (CIF). Experiences accumulated in the US and the European Union has been published over the last years. However, HPN experience for CIF has not been properly documented in South America. This work shows the results achieved by a multidisciplinary team in the administration and management of HPN for CIF in the southern region of Argentina.

	INITIAL	ACTUAL
AGE	54 ± 19	56 ± 13
CHARLSON COMORBIDITY INDEX	2,89 ± 2,3	NA
INITIAL SGA	A 0%, B 31,25%, C 68,75%	A 28,1%, B 62,5%, C 9,4%
BMI	21,8 ± 6,1	23,9 ± 5,5
WEIGHT	60,2 ± 21,3	67 ± 20,1
KARNOFSKY	55 ± 10	75 ± 15
TOTAL PARENTERAL CALORIES PER WEEK	11300 ± 3666	8611 ± 4509
TOTAL PARENTERAL VOLUME PER WEEK IN LITERS	13,63 ± 5,09	12,39 ± 5,98
ALBUMINmg/dl	2,96 ± 1,9	3,68 ± 1,8
HEMATOCRIT	30,4 ± 12	35,6 ± 11
HEMOGLOBINgr/dl	9,9 ± 3,2	11,7 ± 2,1
COLESTEROLmg/dl	121 ± 41	182 ± 37
Total Lymphocyte Count	1470 ± 780	1390 ± 240

BMI, serum albumin, total cholesterol, hemoglobin, Karnofsky and SGA improved during the study. A non-significant reduction in TLC was seen during the same period.

**Methods:** The Patagonian team of Nutritional Support carried out this cases series study. Patients admitted to the HPN team with diagnosis of CIF during the period 2011–2018 were included for analysis. The information collected was stored in an electronic database and the results are expressed in average, standard deviation and percentage, according to the type of variable analyzed. All statistical analyzes were performed in the SPSS-IBM® 24 program.

**Results:** During the study period, a total of 32 patients diagnosed with CIF and requiring HPN were assisted by the team. Table 1 shows baseline characteristics of the patients, along with the results of the latest medical check-up. 53% of the patients were women with an average age at CIF diagnosis of 55 ± 19 years. CIF causes distributed as follows: Extensive intestinal resection due to surgical complication (44%); Postsurgery fistula (17%); Extensive intestinal resection due to intestinal ischemia (13%); Mechanical obstruction due to extrinsic compression (13%); Extensive mucosal disease (10%); and Pseudo intestinal chronic obstruction (3%).

Intestinal anatomy of the patients with SBS was distributed as: *Type I*: 40%; *Type II*: 30%; and *Type III*: 30%; respectively. According to the ESPEN CIF Clinical Classification ESPEN, patients were assigned on admission to categories *D3*:40%; *D2*:40%; *D1*:7%; and *C3*:7%; respectively. The remaining 6% of the patients was scattered among other groups.

Weekly average parenteral calories did not vary during the study: *Admission*: 11,300 ± 3,666 calories vs. *Actual*: 8,611 ± 4,509 (D = -2,689 calories;  $p > 0.05$ ).

HPN outcomes were as follows: Intestinal sufficiency with discontinuation of HPN: 40,6% of the patients; Persistent CIF with prolonged HPN: 40,6%; and Death from the underlying disease while on HPN: 18,7%; respectively.

Average HPN duration was 468 ± 440 (range 2–2635) days. HPN duration differed regarding HPN outcome: *Intestinal sufficiency*: 332 ± 240 days; *Prolonged HPN*: 489 ± 400 days; and *Death while on HPN*: 148 ± 145 days.

Catheter-related bloodstream infection incidence (CRBSI) was 0.88 cases/1000 catheter-days, venous thrombosis 0.25 cases/1000 catheter-days and catheter rupture 0.25 cases/1000 catheter-days. The number of catheter replacements was 0.94 per patient, and average catheter time of useful life was 467 ± 280 days.

**Conclusions:** In the present study series extensive intestinal resection due to surgical complication was the most common cause of CIF. HPN improved selected nutritional markers. HPN also improved the patient's self-sufficiency and quality of life. Patients required lower caloric loads: a sign of better intestinal absorption probably related to rehabilitation of the gut. Almost half of the patients achieved intestinal sufficiency after almost a year on HPN. The 18.75% of mortality was in patients with a malignant cause of CIF. Finally the incidence of catheter related complications were according to international recommendations. All these results demonstrate the safety and feasibility of HPN treatment in our region.

**Disclosure of Interest:** None declared.

#### SUN-PO126

##### PHYSICAL DEVELOPMENT, NUTRITIONAL STATUS AND GASTROENTEROLOGICAL PROBLEMS IN CHILDREN WITH CEREBRAL PALSY

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**Rationale:** In children with severe neurological pathologies, cerebral palsy defect of eating behavior was observed in 40% of cases, and in 90% in children with the 5th level of motor activity according to GMFCS scale. Special position being required, such children should be often fed in a lying position which leads to developing of serious violations in the gastrointestinal tract.

**Methods:** 30 children with cerebral palsy of the 4th and 5th activity levels according to GMFCS scale were examined. Food history was evaluated. Anthropometry and body composition assessment were performed. Life history and medical records as well as the data of hospital admissions were analyzed.

**Results:** Of the 30 children, 2 were on the probe nutrition, the remaining patients were fed through gastrostomy. Prior to installing the patients suffered from constant reflux-esophagitis, gastroduodenitis, because of being fed in a lying position. Aspiration bronchitis, pneumonia, requiring hospitalization had all of them. Everyone had constipation, bowel emptying occurred every three days after applying a suppository with glycerin. Their food had low fiber. Physical examination was revealed signs of malnutrition. Severe malnutrition had more than 30% impaired children, mild 10% and moderate 20%. In

gastrostomy patients began to receive enteral nutrition. Cases of aspiration, bronchitis and pneumonia were reduced. Only two patients had a relapse of gastritis with further hospitalization. The anthropometric data of the patients changed, the children gained weight. According to the analysis of medical records, the incidence of illness decreased by 50%.

**Conclusions:** Determining of physical development in children with cerebral palsy should be carried out depending on the level of motor activity using specialized Growth Charts GMFCS. In children with bulbar and pseudobulbar disorders, swallowing disorders and regurgitation, it is necessary to install a gastrostomy. Children should be fed with special nutritional products in accordance with their biological age and depending on their motor activity. Adequately selected nutrition prevents reflux, aspiration, and as a result bronchitis and pneumonia in children which reduces the drug (antibiotics) load on the patient.

**Disclosure of Interest:** None declared.

#### SUN-PO127

##### CARDIOVASCULAR RISK FACTORS ARE HIGHER IN MALNOURISHED PATIENTS WITH SYSTEMIC SCLEROSIS

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**Rationale:** Cardiovascular disease (CVD) is a well known complication in rheumatoid arthritis and systemic lupus erythematosus. Atherosclerosis (ATS) and its impact on CVD in patients with systemic sclerosis (SSc) still remains unclear. Most of studies are suggesting higher frequency of CVD in SSc in comparison to healthy controls. CVD is a leading cause of death in most developed countries, whereas in SSc population it ranges from 20 to 30%. The etiology of ATS in SSc is unknown. Traditional risk factors, endothelial dysfunction and inflammation can contribute to ATS in SSc population. However, there is lack of data about the impact of the nutritional status on CVD factors in SSc patients.

**Methods:** In 55 patients with SSc (72,7% well-nourished, 18,1% malnourished, 9,1% pre-cachexia) and 49 healthy controls we measured markers of endothelial dysfunction (asymmetric dimethylarginine – ADMA), inflammation (C-reactive protein – CRP, high sensitivity C-reactive protein – hsCRP, interleukin 6 – IL-6) and dyslipoproteinemia (oxidized low-density lipoprotein – ox-LDL, high-density lipoprotein- HDL, low-density lipoprotein – LDL and total cholesterol). Nutritional status was determined with subjective global assessment (SGA), body mass index (BMI), bioelectrical impedance analysis (BIA) and anthropometric measurements.

**Results:** Well-nourished SSc patients had significantly higher level of IL-6 (6,4 ± 10,1 vs. 2,8 ± 3,6 pg/ml;  $p = 0,002$ ) and lower HDL cholesterol (49,9 ± 11,6 vs. 57 ± 13,6 mg/dl;  $p = 0,011$ ) in comparison to healthy control. In malnourished SSc patients there was higher concentration of ADMA (1,68 ± 0,53 vs. 1,24 ± 0,34 μmol/l;  $p = 0,003$ ), CRP (18 ± 28,8 vs. 2,4 ± 2,5 mg/l;  $p = 0,04$ ), IL-6 (21,6 ± 34,9 vs. 2,8 ± 3,6 pg/ml;  $p = 0,004$ ) and lower HDL cholesterol (42,5 ± 18,3 vs. 57 ± 13,6 mg/dl;  $p = 0,01$ ) in comparison to healthy control. Pre-cachexia SSc group had significantly lower total cholesterol (166,8 ± 28,5 vs. 219,3 ± 40,9 mg/dl;  $p = 0,008$ ) and LDL cholesterol (96,8 ± 21,6 vs. 139,6 ± 36 mg/dl;  $p = 0,007$ ). There were no differences in concentration of oxLDL and hsCRP in those groups.

**Conclusions:** Nutritional status may play role in risk of CVD in SSc patients. Although its contribution to morbidity and mortality rates in CVD in SSc is yet to be established.

**Disclosure of Interest:** None declared.



### SUN-PO128 DETERMINING VITAMIN D STATUS IN CHRONIC INFLAMMATORY CONDITIONS

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**Rationale:** While vitamin D deficiency has been implicated in the pathophysiology of inflammatory diseases, evidence that supplementation may cure or prevent chronic disease is inconsistent. Since 25OH-vitamin D (25OHD) is thought to be an acute-phase protein, its utility as a vitamin D status marker in the presence of inflammation is questionable. This study explored interactions of vitamin D and inflammation in patients with Inflammatory Bowel Disease (IBD).

**Methods:** Blood count, transferrin, albumin and CRP were determined by routine assays. Presence of inflammation was defined as CRP levels  $\geq 5$  mg/dL. 25OHD and vitamin D-binding protein (VDBP) levels were determined by ELISA, 1,25OHD and 24,25OHD by LC-MS/MS. Free ( $D_f$ ), bioavailable ( $D_b$ ), and albumin-bound ( $D_a$ ) vitamin D levels were calculated with Bikle's validated formula<sup>1</sup> and correlations with Spearman correlation coefficients.

**Results:** 188 patients with IBD (88 male/100 female; 111 CD/77 UC) aged 18–65 (mean  $44.75 \pm 14.30$ y), participated in the study. CRP correlated positively with 1,25OHD (0.207;  $p=0.006$ ) and VDBP (0.240;  $p=0.002$ ) but negatively with  $D_f$  ( $-0.179$ ;  $p=0.019$ ),  $D_b$  ( $-0.224$ ;  $p=0.003$ ), and  $D_a$  ( $-0.223$ ;  $p=0.003$ ). Serum transferrin correlated only (positively) with VDBP (0.160,  $p=0.037$ ). VDBP was significantly lower in the noninflammatory group ( $p<0.05$ ), while 1,25OHD, VDBP,  $D_f$ ,  $D_b$ , and  $D_a$  levels were influenced by inflammation. 25OHD tended to be (insignificantly) lower in inflammatory conditions (Bikle formula). However, since albumin is affected by inflammation, this result may be illusory.

**Conclusions:** While 25OHD may not accurately reflect vitamin D status, all other vitamin D parameters including free vitamin D ( $D_f$ ) were affected by inflammation. Thus, 25OHD still appears the best vitamin D status marker in chronic inflammatory conditions. We suggest that direct measurement of free vitamin D metabolites might be a promising topic for future research.

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Employee, Immundiagnostik AG, Y. Caicedo-Zea Other: Employee, Immundiagnostik AG, I. Diehl Other: Employee, Immundiagnostik AG, C. Schumann Other: Employee, Immundiagnostik AG, F.-P. Armbruster Other: Managing Director, Immundiagnostik AG, J. Stein Consultant for: Abbvie, Fresenius-Kabi, Immundiagnostik, MSD, Pharmacosmos, Takeda, GI Dynamics, Vifor, Speakers Bureau of: Abbvie, Falk, Ferring, Immundiagnostik, MSD, Pharmacosmos, Takeda, GI Dynamics, Vifor, Other: Manuscript preparation for Abbvie, Falk, MDS.

### SUN-PO129 THE EFFECT OF NUTRITION COMPLEMENTS ON HEALTH CARE COSTS BEFORE AND AFTER THE INCORPORATION OF PATIENTS TO A HOME HOSPITAL UNIT

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**Rationale:** There is a need for evidence for the difference on healthcare resources consumed at a home unit compared to classic hospital conditioned to the nutritional status of the patient.

**Methods:** The sample considered in this study consists of 100 patients of the Hospital Universitario de Elda, Spain, who have gone through two stages of care, hospital care and home care. All these patients might have severe or moderate nutritional problems or not have nutritional problems. Descriptive analysis was carried out. Mean difference test for paired samples was performed and for cases in which the assumption of normality was not met logarithm transformation of the variables have been carried out. These assumptions are verified by the non-parametric normality test of Shapiro-Wilk. Costs are expressed in € 2019 and for a one-year time horizon.

**Results:** Comparing the average healthcare cost of hospital care (5,501.02€) with home care (4,857.21€) moving patients to home units seems to save money to the National Health System. The subgroup of patients that most benefit from this were those ones who were in a severe or moderate malnutrition state and started taking supplemental complements. Under the log transformation of the variables, the Shapiro-Wilk test results in showing significance of the average costs differences at 5% level for those who have severe and moderate malnutrition level. The average number of hospital stays once you have moved to the home unit and initiated the nutrition supplements was reduced from 7.76 to 0.44 (–94.3%) whereas the hospitalization and urgencies were reduced from 1.10 to 0.10 (–90.9%) and 1.99 to 0.45 (77.4%), respectively.

**Conclusions:** Patients with severe and moderate malnutrition state saved money to the system when they start taking nutritional complements and were moved from an hospital unit to a home care unit.

**Disclosure of Interest:** None declared.

**Table** (abstract: SUN-PO129):

Variable	Hospital care (€ 2019)		Home care (€ 2019)	
	Without malnutrition problems (n = 22) Mean (sd)	With severe or moderate malnutrition problems (n = 78) Mean (sd)	Without malnutrition problems (n = 22) Mean (sd)	With severe or moderate malnutrition problems (n = 78) Mean (sd)
Procedures	542.98 (993.19)	368.32 (689.55)	83.04 (251.20)	18.20 (99.50)
Medication	1,460.96 (2941.54)	820.17 (724.96)	1,870.34 (3231.57)	846.12 (737.03)
Nutritional supplementation	–	–	3,581.75 (975.70)	3,397.22 (1097.03)
Hospital stays	2,711.43 (3121.59)	3,444.14 (3942.05)	173.07 (499.87)	189.83 (677.20)
Hospitalization	423.06 (488.51)	477.30 (448.96)	57.69 (148.60)	37.97 (121.70)
Urgencies	501.03 (428.93)	352.05 (323.50)	123.06 (152.68)	76.85 (137.06)
Total cost	5,639.47 (5233.69)	5,461.98 (4956.08)	5,888.96 (3249.76)	4,566.20 (1358.61)

### SUN-PO130 NUTRITIONAL ASSESSMENT IN PERITONEAL DIALYSIS PATIENTS SHOW LOWER PROTEIN AND ENERGY INTAKE THAN RECOMMENDED

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**Rationale:** Protein malnutrition is common in peritoneal dialysis patients and depends on many factors. The aim of this clinical study was to analyze dietary intake of dialysis patients and to determine if it meets their nutritional needs.

**Methods:** A clinical study was carried out on 25 dialysis patients in the Peritoneal Dialysis Unit of University Clinical Center of Ljubljana. Nutritional interview was conducted unannounced three times over a period of one month with the 24 hour recall method. Results were analyzed with the Prodi 6.7 Expert software. Body composition has been measured with bio impedance spectroscopy.

**Results:** Average caloric intake of 25 patients is  $22,74 \pm 6,54$  kcal/kg body weight per day, average protein intake is  $0,86 \pm 0,30$  g/kg body weight per day. Average values of body weights are  $73,33 \pm 13,76$  kg, BMI (body mass index) is  $24,26 \pm 2,53$  kg/m<sup>2</sup>, average LTI -lean tissue index  $13,67 \pm 3,21$  kg/m<sup>2</sup> and values of Phase angle are  $5,08 \pm 1,17$ . Caloric (kcal), protein, fat ( $0,82 \pm 0,35$  g/kg BW per day), carbohydrate (CHO) ( $2,68 \pm 1,08$  g/kg BW per day), sodium (Na+) ( $3,39 \pm 6,69$  g per day), potassium (K+) ( $2,01 \pm 0,55$  g per day), and phosphorus (P) ( $0,87 \pm 0,29$  g per day) intake in 24 hours was monitored. 25 patients were analyzed. Caloric and protein intake values were lower than recommended for dialysis patients.

**Conclusions:** Successful collaboration between patient and dietitian is crucial for objective results of nutritional assessment. Protein and energy intake were found to be lower in peritoneal dialysis patients than recommended.

**Disclosure of Interest:** None declared.

### SUN-PO131 BODY COMPOSITION AMONG NON-FRAIL AND FRAIL PATIENTS UNDERGOING HEMODIALYSIS

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**Rationale:** There is growing evidence suggesting that frailty is associated with adverse outcomes among patients suffering from end stage renal disease. In addition, it seems that every 1 of 2 patients undergoing hemodialysis (HD) is frail. Moreover, it seems that affects not only the elderly but also young adults through an increased catabolism pathway that leads to poor nutritional status.

**Methods:** This descriptive study has the aim to determine the relationship between body composition and frailty status in patients undergoing hemodialysis (n = 130). Body composition (BC) was measured by a segmental multifrequency bioelectrical impedance analysis after HD session and frailty status (FS) was obtained according to Fried Frailty Phenotype, before. In order to find differences between groups we performed T Student or U Mann Whitney. Furthermore, correlations between measures of BC and functional tests (FT), such as gait speed and grip strength, according to FS were found using Pearson or Spearman.

**Results:** A total of 76 patients were included in the final analysis, where 40.8% were determined to be fragile. It's important to mention the collinearity that exists between FT and the detection of FS. Non-frail showed higher numbers of skeletal muscle mass, total body water, torso mass, left arm mass, left leg mass and lower numbers of extracellular/intracellular water ratio (p < 0.05). We also found Pearson and Spearman correlations in the bioelectrical impedance and functional tests.

**Conclusions:** From the results presented, we conclude that phase angle shows persistent correlation in both groups of FS and FT. Muscle mass is correlated to grip strength in the non-frail; however, isn't correlated to FT in frail patients. Then, ratio ECW/ICW is negatively correlated to grip strength in both groups. Also, frail patients show less muscle mass than non-frail. We need to study these variables in a larger population; notwithstanding, these results demand creation of intervention strategies in order to lessen frailty, therefore enhance quality of living. Finally, is important to be aware that to manage this situation is mandatory an interdisciplinary approach.

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**Disclosure of Interest:** None declared.

**Table 1** (abstract: SUN-PO131): Descriptive data, body composition and functional tests

	Pre-frail	Frail	Total
Male	25 (55.6)	12 (38.7)	37 (48.7)
Female	20 (44.4)	19 (61.3)	39 (51.3)
Age	65 (60–72)	66 (62–73)	66 (60–72)
Muscle mass (kg)	24.7 (20.7–28.4)*	22.3 (17.1–14.9)*	23.2 (19.6–27.0)
TBW (L)	37.52 (7.38)*	33.87 (6.98)*	36.03 (7.39)
ICW (L)	21.19 (5.54)*	18.66 (4.20)*	20.16 (4.55)
Ratio ECW/ICW	0.8 (0.7–0.8)*	0.8 (0.8–1.0)*	0.8 (0.7–0.9)
Phase angle (°)	6.38 (1.26)	5.90 (1.36)	6.19 (1.32)
Torso muscle mass (kg)	11.73 (2.59)*	10.01 (2.41)*	11.03 (2.65)
Left arm muscle mass (kg)	1.54 (1.11–1.74)*	1.19 (0.96–1.39)*	1.31 (1.01–1.70)
Left leg muscle mass (kg)	4.98 (1.19)*	4.29 (1.33)*	4.70 (1.29)
Gait speed (m/s)	0.8 (0.7–1.0)*	0.66 (0.50–0.80)*	0.78 (0.60–1.00)
Grip strength (kg)	21.23 (6.53)*	16.03 (6.49)*	18.96 (6.97)

FTI: Fat Tissue Index, LTI: Lean Tissue Index, TBW: Total Body Water, ECW: Extracellular water, ICW: Intracellular water. \*p < 0.05, difference between frail vs Non-frail group.

**SUN-PO132**  
**ANEMIA AND HEMATOLOGICAL FEATURES OF DYSPHAGIC PATIENTS THAT UNDERWENT ENDOSCOPIC GASTROSTOMY: A 9 YEARS AND 472 PATIENTS STUDY**

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**Rationale:** Patients undergoing endoscopic gastrostomy (PEG) may present protein-energy malnutrition, anemia and deficiencies of hematoopoietic factors: iron, folate and vitamin B12. There are no comprehensive studies on anemia or other hematological changes in PEG-patients. Our aim was to evaluate the hematological status of dysphagic patients that underwent PEG and its association with clinical outcome

**Methods:** Retrospective study of patients followed by our Artificial Feeding Team, submitted to PEG from 2010 to 2018. Patients were divided into two etiological groups: neurological dysphagia (ND) and head/neck or esophageal disorders (HNE). Laboratory data included serum albumin, hemoglobin, mean corpuscular volume, ferritin, transferrin, iron, vitamin B12 and folate. Survival after PEG was recorded in months, until death or December 2018

**Results:** We evaluated 472 patients, 250 (53%) presented anemia at the time of gastrostomy, mostly normocytic (n = 219), with laboratory data suggestive of anemia of chronic disease (ACD). Six patients (1.3%) presented vitamin B12 deficiency and 57 (12.1%) presented folate deficit. No statistically significant difference in hemoglobin between the two groups (p = 0.230) were found. Folate and vitamin B12 levels were lower in the HNE group (p < 0.01). A positive correlation between hemoglobin and survival was present (p < 0.01, r = 0.289) and levels were lower in the deceased population (p < 0.01).

**Conclusions:** Anemia is highly frequent in PEG-patients, mostly with the features of ACD or multifactorial. Deficiencies in hematopoietic factors are frequent and should be corrected. Anemia is associated with significant decrease in survival and may be looked as a marker of severe metabolic distress, signaling poor outcome.

**Disclosure of Interest:** None declared.

**SUN-PO133**  
**ASSESSMENT OF RENAL FUNCTION IN HOME PARENTERAL NUTRITION PATIENTS FOR INTESTINAL FAILURE**

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**Rationale:** Home parenteral nutrition (HPN) patients have risks factors for chronic kidney disease (CKD). Many formulas are used to estimate glomerular filtration rate (GFR). The aim of this study was to compare the performance of estimates of GFR using several equations with measured GFR in HPN patients.

**Methods:** 15-years retrospective study. Collected data: age, BMI, parenteral nutrition (PN) duration, creatininemia. Measured GFR by inulin or iohexol clearance, estimated GFR by CKD-EPI, MDRD, Schwartz 2009 (S09). Relative bias, 30% accuracy (P30), paired T test, Pearson correlation were used to determinate equations reliability. Results were expressed in mean ± SD.

**Results:** 115 patients, 47.8% men, age: 53.9 ± 17.5 years, BMI: 21.6 ± 4.7, 73.9% of short bowel, PN duration: 80.7 ± 77.7 months. Mean measured GFR was 67.3 ± 26.9 mL/min/1.73 m<sup>2</sup> and was above 90 mL/min/1.73 m<sup>2</sup> in 21.7%, between 60 and 90 in 34.8%, 30 to 60 in 35.7% and below 30 in 7.8%.

	CKD-EPI	MDRD	Schwartz 2009
Estimated GFR (mL/min/1.73m <sup>2</sup> )	86.4 ± 33.6**	91.9 ± 44.6**	86.3 ± 36.3**
Relative bias (mL)	19.5 ± 20.1	25.8 ± 30.7	19.2 ± 25.0
P30 (%)	52.2	49.6	46.1

\*\*<0.0001.

The bias was negatively correlated with age and creatininemia for CKD-EPI and MDRD and with only creatininemia for S09.

With CKD-EPI, MDRD and S09, stages of renal disease were correctly estimated in 51.3%, 54.8% and 51.3% (S09) and the severity of CKD was underestimated in 47.0, 41.7 and 42.6%, mainly for stages 1 and 2.

**Conclusions:** 43.5% of HPN patients had a moderate to severe chronic kidney disease. Equations present a low precision and overestimate GFR notably for patients with an estimated GFR above 60 mL/min/1.73 m<sup>2</sup> and for young patients. So, measured GFR should be recommended as possible to assess renal function in these patients.

**Disclosure of Interest:** None declared.

**SUN-PO134**  
**OMEGA-3 POLYUNSATURATED FATTY ACIDS REDUCE INTESTINAL MUCOSAL BARRIER DAMAGE VIA ACTIVATION OF CHOLECYSTOKININ IN CHRONIC KIDNEY DISEASE**

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**Rationale:** Previous studies including ours have shown that chronic kidney disease (CKD) could lead to intestinal mucosal barrier damage followed by many complications. Increasing evidence suggests that omega-3 polyunsaturated fatty acids can reduce intestinal injury and improve intestinal function in many diseases. In this study, we therefore investigated the effect of omega-3 polyunsaturated fatty acids on intestinal mucosal barrier in CKD and the underlying mechanism.

**Methods:** CKD was induced by the 5/6 kidney resection, and omega-3 polyunsaturated fatty acids was administered for six weeks. To assess the intestinal mucosal barrier changes, blood samples were collected for measuring the serum D-lactate level, and terminal ileum tissue samples were used for analyses of intestinal permeability and histopathology. The intestinal malondialdehyde (MDA) level and superoxide dismutase (SOD) activity were also assessed.

**Results:** CKD increased serum D-lactate level, intestinal permeability, intestinal mucosal and submucosal edema and inflammation, and the Chiu's scores assessed for intestinal mucosal injury (P < 0.05). However, compared to the control, omega-3 polyunsaturated fatty acids treatment markedly reversed these adverse parameter changes (P < 0.05). In addition, the intestinal MDA level was reduced and the intestinal SOD activity was increased after omega-3 polyunsaturated fatty acids treatment (P < 0.05).

**Conclusions:** Omega-3 polyunsaturated fatty acids could reduce intestinal mucosal barrier damage induced by CKD, which is most likely due to its anti-oxidative activity.

**Disclosure of Interest:** None declared.



### SUN-PO135 MEALBOX FOR DIALYSIS PATIENTS

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**Rationale:** The aim was to investigate whether a specifically developed mealbox can provide support to dialysis patients in preparing a healthy and balanced meal while simultaneously complying with their diet requirements.

**Methods:** The development of the mealbox consisted of the creation of recipes, setting up logistics and performing a pilot. Dieticians have drawn up conditions for the recipes. The price and preparation were involved. Two pilots were done on a select group of patients. The last pilot contained all hemodialysis patients of our centre. An evaluation form with five questions about the taste, portion size, clarity of the recipe, level of difficulty of preparation and the price, were used for evaluation. Answers could be given on a 10-points scale.

**Results:** Ten recipes were developed and contained 470–790 kilocalories, >24 g proteins (max 41 g), 455–635 mg phosphate, 990–1250 mg potassium and 0.2–1.2 g salt per portion. We observed a clear interest by dialysis patients for the mealbox concept, as attested by the high participation rate: 59 patients participated out of 130 patients who were approached (45%). Evaluation form response was 40%. The meals were rated (mean and sd) taste 7.6 (SD 1.8), portion size 7.6 (SD 2.2), clarity 8.0 (1.9), difficulty 8.4 (SD 1.1), and price 7.0 (SD 2.7).

**Conclusions:** Our mealbox concept, aimed at preparing a balanced meal that complies with the diet requirements for dialysis patients, was positively evaluated by patients. Furthermore, it was technically and logistically feasible to execute the concept in our center.

**Disclosure of Interest:** None declared.

### SUN-PO136 WHY DOES ADMINISTRATION OF OMEGA-3 FATTY ACIDS IN CHRONIC DISEASES ONLY SOMETIMES SHOW BENEFIT?

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**Rationale:** Trials of omega-3 fatty acids (w3-FAs) in cardiovascular disease, depression and cognitive impairment have given inconsistent results. One possible reason might be that the biological effect of w3-FAs is dependent on other, interacting, factors that are either unknown or not measured in the trials.

**Methods:** Literature review of trials.

**Results:** Several potential interacting factors were identified. 1. Baseline level of w3-FAs. If the baseline level is too low, then even after administration of w3-FAs the concentration might not reach the threshold for biological effect. (Carney 2016). 2. Genetic polymorphism. The beneficial effect of w3-FAs in cognitive impairment and in risk of dementia is influenced by the e4-allele of ApoE, with most studies showing a protective effect only in those who carry this allele. (Yassine 2017). 3. Oxidative stress. The beneficial effect of a high w3-FAs index in depression is largely found only in subjects with high levels of markers for oxidative stress (Bigornia 2016) and a beneficial interaction between w3-FAs and anti-oxidant vitamins in cognitive decline has been reported (Assmann 2018). 4. B vitamin status. The protective effect of B vitamins on brain atrophy and on cognitive decline in people with Mild Cognitive Impairment was only

found in those with a good w3-FA status at baseline (Jernerer 2015; Oulhaj 2016). Likewise, the protective effect of w3-FA status on brain atrophy was only found in those with a good B vitamin status. A trial of w3-FAs in patients with Alzheimer's disease only slowed cognitive decline in those with a good baseline B vitamin status. (Jernerer 2019).

**Conclusions:** The effects of w3-FA may only be found in certain subgroups of the population. It is important to identify these subgroups so that effective use can be made of w3-FA supplements.

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Jernerer 2019 *J Alzheimer's Dis* (in press)

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### SUN-PO138 EDEMA INDEX ESTABLISHED BY A MULTIFREQUENCY BIOELECTRICAL IMPEDANCE ANALYSIS IN PATIENTS ON KIDNEY TRANSPLANT WAITING LIST

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**Rationale:** A multifrequency bioelectrical impedance analysis (BIA) is a noninvasive and reproducible modality for estimating the fluid state. Regarding differences in body size and hypervolemic status, the edema index as an independent indicator is obtained by calculating the ECF/TBF ratio. Therefore, the edema index measured by BIA may be a useful marker for defining volume status, and it may be associated with mortality in end stage renal disease (ESRD) patients.

The aim of this study was to test the BIA-derived edema index and to evaluate the association between this index and anthropometric measurements in dialysis patients on kidney transplant waiting.

**Methods:** Prospective study was conducted in a tertiary reference hospital. BIA and anthropometric measurements (weight, height, waist and hip circumferences), handgrip strength of 86 adult patients were measured and Geriatric Nutritional Risk Index (GNRI) was calculated. Following body subunits were evaluated: fat free mass (FFM), fat mass (FM), muscle mass (MM), total body water (TBW), intracellular (ICW) and extracellular water (ECW). The edema index was defined as the ratio of extracellular fluid to total body fluid. Statistical analysis was performed using R version 3.4.3, p values <0.05 were considered as statistical significant.

**Results:** There were 43 (50%) female and 43 (50%) male patients with an average age of 44.9 (range 20–69) years. On the basis of a cutoff value of edema index of 0.390, patients were separated into two groups: edema index more than 0.390 (n = 37) and edema index of 0.390 or less (n = 49). Compared with patients with edema index 0.390 or less, those with edema index of more than 0.390 were anuric (p < 0.01), older (p < 0.02), had lower muscle mass (p < 0.003), lower handgrip strength (p < 0.004), and significantly lower GNRI (p < 0.02). There were no significant differences between groups in sex, weight, FM, FFM.

**Conclusions:** Edema index was found to be associated with older age, lower muscle mass and handgrip strength. Hence, the edema index determined by BIA measurements should be used to closely monitor ESRD patients.

**Disclosure of Interest:** None declared.

#### SUN-PO139 CORRELATION OF SERUM LEPTIN AND NUTRITIONAL PARAMETERS IN ESRD PATIENTS

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**Rationale:** Malnutrition has very complex patterns in patients with end-stage renal disease (ESRD) and is associated with poor prognosis. Leptin is a small peptide hormone which is produced mainly, but not exclusively by adipocytes. It plays a key role in regulating energy intake and expenditure, including appetite and hunger, metabolism and behavior.

The aim of this study was to evaluate the volume, nutritional status by bioelectrical impedance analysis (BIA), biochemical markers and to investigate the correlation between serum leptin and the nutritional parameters in ESRD patients, who are on the kidney transplant waiting list.

**Methods:** Prospective study was conducted in a tertiary reference hospital. We enrolled a total of 64 ESRD patients. Routine serum markers including albumin and the appetite regulating hormone, serum leptin, were measured. Multi-frequency BIA was used for the assessment of extracellular water (ECW), intracellular (ICW), fat (FM), lean mass (LM), body cell mass (BCM) and phase angle (PhA). The following anthropometric measurements were determined: body mass (kg), waist circumference (cm) and hip circumference (cm). Body mass index (BMI), estimated according to the post-dialysis mass/height<sup>2</sup> (kg/m<sup>2</sup>). The nutritional status was estimated with the use of the 7-point Subjective Global Assessment (SGA). Statistical analysis was performed using R version 3.4.3, p values <0.05 were considered as statistical significant.

**Results:** Mean age of patients was 44.9 ± 12.5 (range 22–69) years. 33 (51.5%) were male. The average of values of BCM was 38.1 [22.3;60.6] kg, FFM 60.4 (±14.2) kg, leptin 24.5 [0.2;103.9] ng/mL, BMI 25.6 [17.6;43] kg/m<sup>2</sup>, CRP 3.9 [0.32;21.6] mg/L. Mean PhA and ECW were significantly higher in males (6.2[0.9;13.1]°, 20[14.7;35.9]L) than in females (5.1[2.3;13.1]°, 13.9[10.1;22.4]L)(P < 0.05). SGA- defined moderate malnutrition was present in 27 (42.1%) patients. PhA and albumin were significantly higher in normal nutritional group (SGA A) in malnourished (SGA B) group 6.2 [3.9;13.1°] vs 5.1 [2.3;7.71°], albumin 43.1(±4.6) g/L vs 40.6 (±4.7) g/L. Other variables (BMI, ECW, CRB, LM, BCM, leptin, waist and hip circumferences) were not significantly different between the groups. Leptin was positively associated with fat mass (r = 0.63, P < 0.0001) and BMI (r = 0.45, P = 0.0002) and negatively associated with extracellular water (r = -0.35, P = 0.0045) in the studied population.

**Conclusions:** This study demonstrated significantly higher albumin and PhA in well-nourished group. The positive correlation between body fat and serum leptin is probably explained primarily by the increased release of leptin from large fat cells. In fact, some studies have proposed that leptin can serve as an indicator of fat content and that its levels increase exponentially with increasing body fat percentage.

**Disclosure of Interest:** None declared.

#### SUN-PO140 DURING LOW-GRADE INTESTINAL INFLAMMATION, INGESTION OF STREPTOCOCCUS THERMOPHILUS CNRZ160 LIMITED THE LEAN BODY MASS LOSS IN OLDER ADULTS

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**Rationale:** Aging is reflected, at the systemic level, by the development of low-grade inflammation, which is one of the explanatory factors for the development sarcopenia by preventing post prandial muscle anabolism. The origin of this 'inflammaging' is still not clearly defined. An increase in intestinal permeability, a microbiota dysbiosis and subsequent generation of a micro- and then generalized inflammation has been hypothesized. The objective of our study is to test in vivo during aging, if 1) a chronic low grade intestinal inflammation can lead to anabolic resistance and muscle loss and 2) if a bacterial strain with anti-inflammatory properties in vitro could prevent these adverse effects.

**Methods:** To generate low grade intestinal inflammation, elderly rats (18 m) were treated with Dextran Sodium Sulfate (DSS) (4% w/v in drinking water) for 28 days with (CNRZ group) or without (DSS group) *S. Thermophilus* CNRZ160 (10<sup>9</sup> CFU / day) previously shown to have anti-inflammatory potential in vitro (Junjua.2016). They were compared to pair fed control rats (PF). Body weight and food intake were monitored daily, lean mass and body fat measured by EchoMRI at day 0, 14 and 28, and muscle and colon weights measured at day 28 at slaughter. Muscle protein synthesis was measured in the post-prandial state using the flooding dose method with <sup>13</sup>C Valine. Groups were compared using ANOVA and Fisher posthoc test (significance: p < 0.05; P > 0.05: NS)

**Results:** Body weight, lean mass and fat loss at day 28 was significantly greater in DSS compared to PF controls (-110 vs -86 g, -51 vs -36 g and -65 vs -47 g, respectively, p < 0.05). Similarly, gastrocnemius and tibialis muscles were smaller by 12% and 10% vs PF respectively (p < 0.05). In contrast, colon weight was increased by 13% with DSS (P < 0.05 vs PF). CNRZ160 allowed to: 1) maintain normal colon weight (2.09 for CNRZ vs 2.14 g for PF, NS) 2) limit the loss of lean body mass (-38 g for CNRZ vs -36 g for PF, NS), 3) limit to 4 and 5% the loss of muscle mass (CNRZ intermediate between PF and DSS, P > 0.05 vs DSS and PF) explained by a better maintenance of post prandial muscle protein synthesis (p < 0.05).

**Conclusions:** In the elderly, the loss of lean and muscle mass associated with low-grade inflammation of intestinal origin can be reduced by the ingestion of *S. Thermophilus*. It could therefore be considered as an efficient probiotic to modulate frailty and sarcopenia during aging.

**Disclosure of Interest:** None declared.

#### SUN-PO141 RIGHT HEART FAILURE AS A RISK FACTOR FOR CARDIAC CACHEXIA IN HEART FAILURE PATIENTS: PROSPECTIVE COHORT STUDY

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**Rationale:** Cardiac cachexia (CC) is a common complication in patients with advanced heart failure (HF) and a significant risk factor for poor prognosis. Several factors are involved in the development of CC. However, there are no longitudinal studies to assess RHF as a risk factor for the development of CC in HF patients.

**Methods: Objective:** to investigate whether RHF is a risk factor for CC in HF patients.

A prospective cohort study. Subjects with confirmed diagnoses of HF were included. Patients with congenital heart disease, cancer, HIV, drug use and end-stage renal disease were excluded. CC was definite according to bioelectrical impedance vectorial analysis criteria. Follow-up at 42 months.

**Results:** From 282 without CC at the initial evaluation, after 42 months follow-up 65 subjects had developed CC. They were older ( $63.7 \pm 16.8$  vs.  $54.7 \pm 16.5$  years,  $p < 0.001$ ) with less handgrip strength ( $20.5 \pm 8.5$  vs.  $25.8 \pm 11.2$  kg,  $p < 0.001$ ) and smaller phase angle ( $5.0 \pm 1.2$  vs.  $5.7 \pm 1.1^\circ$ ,  $p < 0.001$ ) than those who did not develop CC. RHF was an independent predictor of CC (HR: 2.91, 95%CI: 1.61 to 5.26,  $p < 0.001$ )

**Conclusions:** RHF was an independent predictor for the development of CC in HF

**Disclosure of Interest:** None declared.

#### SUN-PO142

#### SCREENING FOR MALNUTRITION IN RENAL WARDS: AN AUDIT COMPARING THREE MALNUTRITION SCREENING TOOLS TO INFORM SERVICE QUALITY IMPROVEMENT

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**Rationale:** People with chronic conditions like renal disease are more likely to be malnourished, due to the impact of uraemia, inflammation, comorbidities, metabolic changes and dialysis. It is estimated that around half of the patients admitted to a renal ward are malnourished (1). Malnutrition screening tools are essential in identifying patients who require further dietetic input (2). This audit was conducted to help establish an appropriate malnutrition screening tool for patients with CKD at Imperial College Healthcare Trust.

**Methods:** This pre-implementation audit compared the Renal iNUT (renal specific, validated) (3), MUST (used widely in UK hospitals) and ESPEN (currently used across all wards in the Trust) tools (2) against individualised dietetic screening, on all tertiary renal wards of Hammersmith Hospital. 43 patients out of 72 inpatient beds (60%) from 4 renal wards were screened using all three tools by student dietitians. Each tool was then compared against dietetic screening and assessment. The audit was registered with the Quality and Safety Therapies team.

**Results:** Dietetic screening identified 25 patients at risk of malnutrition plus 8 patients for diet education only. ESPEN identified 12 patients at risk of malnutrition and had the lowest sensitivity (23.3%) and specificity of 34.4%, MUST identified 16 patients and had 32.6% sensitivity and 34.9% specificity and iNUT identified 34 patients at risk and had the highest sensitivity of 55.8% and lowest specificity of 16.3%.

**Conclusions:** This audit demonstrated that iNUT was more sensitive than the other tools and is more likely to trigger the most referrals to dietitians. Changing to iNUT from ESPEN in our wards would be beneficial in reserving dietetic time from screening, however may trigger some referrals for patients who do not require dietetic input.

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**Disclosure of Interest:** None declared.

#### SUN-PO143

#### AGGRESSIVE WEIGHT LOSS PROGRAM WITH A KETOGENIC INDUCTION PHASE FOR THE TREATMENT OF CHRONIC PLAQUE PSORIASIS

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**Rationale:** Chronic plaque psoriasis is an inflammatory skin disease associated with obesity, a condition characterized by low-grade inflammation. Weight loss (WL) has been demonstrated to reduce psoriasis severity and inflammation. Very low-calorie ketogenic diet (VLCKD) has been associated with a significant reduction in visceral adipose tissue and keton bodies likely have anti-inflammatory properties. We evaluate the efficacy of an aggressive WL program with a ketogenic induction phase as first-line treatment of chronic plaque psoriasis.

**Methods:** We conducted a single-arm trial conducted (NCT03531528). Adult overweight/obese patients (N = 37) with stable chronic plaque psoriasis underwent a 10-week two-phase WL program consisting in a 4-week protein-sparing, VLCKD (<500 kcal/day; 1.2 grams of protein/kg of ideal body weight/day) and a 6-week balanced, hypocaloric (25–30 kcal/kg of ideal body weight/day), low glycemic index, Mediterranean-like diet. The primary endpoint was the reduction in the Psoriasis Area and Severity Index (PASI) at week 10. Major secondary endpoints included: improvement of PASI  $\geq 50\%$  and  $\geq 75\%$ , reduction in body surface area (BSA) involved, improvement of itch severity (visual-analogue scale) and Dermatology Life Quality Index (DLQI) at week 10.

**Results:** With a mean body weight reduction of 12.0%, dietary intervention resulted in a significant reduction in PASI (mean  $\pm$  standard deviation baseline score,  $13.8 \pm 6.9$  [range, 7–32]): mean change,  $-10.6$  [95%CI,  $-12.8$  to  $-8.4$ ] ( $P < 0.001$ ). A reduction in PASI  $\geq 50\%$  and  $\geq 75\%$  was recorded in 36 (97.3%) and 24 (64.9%) patients, respectively. Treatment resulted also in a significant reduction of BSA involved and an improvement in itch severity and DLQI ( $P < 0.001$  for all).

**Conclusions:** In adult overweight patients with stable chronic plaque psoriasis an aggressive dietary WL program consisting in a ketogenic regimen followed by a balanced, hypocaloric Mediterranean-like diet appeared an efficacious first-line strategy for improving disease severity. Comparative studies with other dietary regimens and long-term efficacy data are warranted.

**Disclosure of Interest:** None declared.



### SUN-PO144 USEFULNESS OF BIO-IMPEDANCE MEASUREMENT IN RHEUMATOLOGIC PATIENTS MONITORING

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**Rationale:** Rheumatologic diseases such as systemic sclerosis (SS) need continuous monitoring for their follow-up/treatment. SS patients suffer very often from malnutrition (1). Only a few reports from literature show how the nutritional status (NS) assessment can be used for these aims (1). Bio-impedance (BI) is the gold standard for NS assessment in humans.

Thus, we aimed to assess NS of rheumatologic patients and its possible correlation with disease stage.

**Methods:** From March 2018 to March 2019, we consecutively enrolled rheumatologic patients admitted to the Internal Medicine Unit of San Benedetto del Tronto General Hospital. All the patients underwent a complete NS assessment before and after iloprost infusion.

**Results:** We consecutively enrolled 16 patients (10 with SS, 4 with undifferentiated connective tissue diseases and 2 rheumatic polymyalgia; mean age 68 ± 1.1 years, F 10, BMI 26.2 ± 0.8 Kg/m<sup>2</sup>, phase angle 4.5 ± 0.6°). According to PA values, 90.9 ± 1.5% of patients had a reduced free fat mass indicative of malnutrition. In agreement with literature, there was no significant correlation between BMI values and disease stage (1). However, a significantly lower PA, higher extra-cellular water content correlated with a higher disease activity ( $r = 0.6$  and  $r = 0.61$ , respectively). Moreover, these two items significantly correlated with higher inflammatory biochemical parameters (e.g. PCR) ( $r = 0.5$  and  $0.48$ , respectively).

More interestingly, we observed a significant PA increase and extra-cellular water content decrease after iloprost infusion in all patients (3.1 ± 0.6 vs. 4.0 ± 0.4° and 70.5 ± 8.7 vs. 48.7 ± 9.1%, both  $p < 0.05$ )

**Conclusions:** This prospective single-center study showed for the first time the significant correlation between BI parameters and disease gravity in a small cohort of rheumatologic patients. These preliminary results suggest the possible use of BI in patients staging, follow-up and assessment of treatment response.

**Disclosure of Interest:** None declared.

### SUN-PO145 INTRAMUSCULAR FAT IS PREDICTIVE OF HYPOGLYCEMIA INCIDENCE IRRESPECTIVE OF MALNUTRITION RISK. RESULTS FROM THE MENU-STUDY

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**Rationale:** Malnutrition risk was found to be associated with incident hypoglycemia among hospitalized patients in internal medicine units. We wanted to analyze body composition among patients with high risk of malnutrition, with and without hypoglycemia.

**Methods:** Included were patients enrolled in the MENU study that underwent CT scanning during their hospitalization. The NRS2002 was used for nutritional screening. Body composition was analyzed at the level of L3 using SliceOmatic software (TomoVision, Montreal, Canada). Body composition surface area of each tissue was corrected for height squared. Patients were categorized as hypoglycemic if they had at least one documented hypoglycemic event during the hospitalization period (glucose  $\leq 70$  mg/dL). Regression analysis was

used to examine the association of body composition with incident hypoglycemia.

**Results:** Included were 155 patients (mean age 69.7 ± 15.7, 51.6% were males, 52.9% had diabetes mellitus). Rate of positive NRS2002 was 57.8%, and 26 patients (16.7%) had at least one documented hypoglycemic event. Patients at risk of malnutrition had lower muscle mass (44.9 ± 12.5 vs. 49.3 ± 13.6 cm<sup>2</sup>/m<sup>2</sup>,  $p = 0.045$ ), and lower subcutaneous fat (59.4 ± 40.7 vs. 86.8 ± 49.7 cm<sup>2</sup>/m<sup>2</sup>,  $p < 0.001$ ) and visceral fat (64.3 ± 40.2 vs. 93.4 ± 58.1 cm<sup>2</sup>/m<sup>2</sup>,  $p = 0.001$ ). Regression analysis showed that the NRS2002 (OR 4.986, 95% CI 1.052–23.632,  $p = 0.043$ ) and insulin treatment (OR 7.769, 95% CI 1.529–39.461,  $p = 0.013$ ) were predictive of hypoglycemia in this patient population. Furthermore, intramuscular fat was also indicative of hypoglycemia incidence (OR 1.091, 95% CI 1.002–1.187,  $p = 0.044$ ). Muscle mass, subcutaneous and visceral fat mass as well as sex, albumin and diabetes mellitus status did not affect incident hypoglycemia.

**Conclusions:** Our data suggests that intramuscular fat is predictive of hypoglycemia incidence among patients admitted to internal medicine units, irrespective of malnutrition risk.

**Disclosure of Interest:** None declared.

### SUN-PO146 ALS, GASTROSTOMY AND SURVIVAL: TRYING TO CLARIFY OBSTACLES TO OPTIMIZE OBJECTIVES

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**Rationale:** Malnutrition in amyotrophic lateral sclerosis (ALS) is a risk factor for mortality. On the other hand, to date it has not been possible to demonstrate that nutritional treatment increases survival.

Our aim was to analyze the influence of gastrostomy placement in the mortality of ALS patients in our cohort.

**Methods:** Retrospective analysis of the patients evaluated in the multidisciplinary unit of ALS in our centre between 2013 and 2017.

**Table 1**  
Descriptive data of the sample.

Population	N = 88 (%)
Sex	
Women	48 (54,5)
Age at onset	64,98 ± 12,44
Type of ALS	
Spinal	56 (63,7)
Bulbar	31 (35,2)
Respiratory	1 (1,1)
Dysphagia	77 (87,5)
Non-invasive ventilation	38 (50)
Tracheostomy	5 (5,7)
Weight loss >10%	20 (31,7)
Initial BMI	25,9 ± 4,2
Survival	
Immediately accepted	1118 ± 705
Delayed	1198 ± 692
Rejected	1004 ± 635
Exitus	71 (80,7)

**Results:** 88 ALS patients were assessed and followed in our unit during the afore mentioned period. 71 patients (80.6%) met criteria for PEG placement, 29 (41%) immediately accepted and 12 (16.9%) delayed the PEG because of initial rejection. PEG was refused in 30 patients (42%).

The mean of forced vital capacity was  $47 \pm 18.17\%$ . The overall survival was  $1141 \pm 808$  days, with no significant differences between immediate acceptance or rejection. Weight loss occurred from the onset to the insertion of the PEG correlated statistically significantly with a higher overall mortality with a moderate-high correlation of Pearson ( $R = 0.511$ ,  $p < 0.001$ ), mainly among patients who rejected PEG ( $R = 0.681$ ,  $p < 0.0001$ ).

**Conclusions:**

- Reject or the delay in the placement of the PEG has not led to a lower global survival in this first assessment. Detailed analysis of the sample is necessary to clarify possible factors that interfere in survival, as atypical forms of ALS.
- Malnutrition is confirmed as a significant prognostic factor regarding mortality in patients with ALS, so efforts to prevent it should be increased.

**Disclosure of Interest:** None declared.

**SUN-PO147**

**LIFE QUALITY OF PATIENTS WITH IRRITABLE BOWEL SYNDROME**

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**Rationale:** Irritable bowel syndrome (IBS) is a functional disorder characterized by chronic recurrent abdominal pain and alteration of intestinal habits regardless of known organic cause. Irritable bowel syndrome, which is a frequently encountered disease in stress, does not affect mortality and morbidity, but adversely affects the quality of life.

**Methods:** This study was conducted with seventy individuals (18 males, 52 females) between 20 and 55 years with IBS. The data of the study were gathered by the researcher using face-to-face interviews with the patients using the 'survey method'. Short Form 36 (SF-36) was used for evaluation of the quality of life.

**Results:** The mean age of the patients is  $37.8 \pm 10.03$  years and 40% of them is in the subgroup of IBS-mixed. While the scores of physical function, role physical and role emotional of male subjects were higher than female subjects, pain scores of female subjects were higher than male subjects ( $p < 0.05$ ). Statistically, significant differences were found between genders in terms of physical function ( $Z = -4.276$ ;  $p < 0.05$ ), role limitations due to physical health ( $Z = -4.107$ ;  $p < 0.05$ ), pain ( $Z = -2.259$ ;  $p < 0.05$ ) and role limitations due to emotional problems ( $Z = -4.361$ ;  $p < 0.05$ ). Male individuals have higher scores on physical function, role limitations due to physical health and role limitations due to emotional problems than female subjects, while female subjects have higher pain scores than male subjects. The pain scores of those with comorbid disease are significantly higher than those without comorbid disease ( $Z = -2.533$ ;  $p < 0.05$ ).

**Conclusions:** Patients with IBS have a generally low quality of life when compared to a healthy population. Especially female patients have lower scores than males. IBS patients should be trained in stress management, as well as, psychological support should be recommended to the patients who are considered necessary.

**Disclosure of Interest:** None declared.

**SUN-PO148**

**THE EFFECT OF CONTINUOUS AND INTERVAL NUTRITION EDUCATION ON DIABETES STATUS AND BODY COMPOSITION OF TYPE 2 DIABETES**

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**Rationale:** Nutrition education is considered the cornerstone of diabetic management. This study was conducted in order to analyze the effect of continuous and interval nutritional education on the clinic and anthropometric measurements in type 2 diabetic patients (Type2DM).

**Methods:** This study was carried out in 2 phases. The first part of the study examined the lifestyle and eating habits of 135 people with diabetes. In the second part, 47 individuals were divided into two groups, nutrition training was given at different intervals. Individuals who reside in İzmir has received 20 nutritional educations in total, for 10 months at intervals of 15 days. This education was named continuous nutritional education (CNE). Individuals who come from the towns of İzmir has received 5 nutritional educations in total, for 10 months at intervals of 2 months. This was named interval nutritional education (INE). The education which was given to both groups was designed in the form of 5 modules. The data was collected via questionnaire form. Body mass index (BMI) was calculated and their waist and hip circumferences was measured. Individuals' body compositions was determined by an impedance analyzer. This study was supported by İzmir Katip Çelebi University Scientific Research Project Coordinator (2016-GAP-SABF-0014).

**Results:** Body weight (kg), BMI ( $\text{kg}/\text{m}^2$ ), fat mass (%), fat mass (kg), muscle mass (kg), waist circumference (cm), waist-hip ratio, neck circumference (cm), and wrist circumference (cm) were similar in groups before nutrition education. After CNE, body weight, BMI, fat mass (%), fat mass (kg), muscle mass, waist circumference, hip circumference, waist-hip ratio, neck circumference, and wrist circumference were not significantly changed. After INE, body weight and BMI changes were found to be statistically significant ( $p = 0.006$  and  $p = 0.008$ ). The fat mass (%), fat mass (kg), muscle mass, waist circumference, hip circumference, waist-hip ratio, neck circumference, and wrist circumference were not significantly changed after INE. Fasting blood glucose, total cholesterol, triglyceride, HDL and LDL cholesterol, HbA1c levels did not change significantly after CNE and INE.

**Conclusions:** It is thought that it is important to prepare structured and individualized educational contents by considering the socio-economic status of patients in future studies.

**Disclosure of Interest:** None declared.

**SUN-PO149**

**THE RELATIONSHIP BETWEEN WAIST CIRCUMFERENCE AND DIETARY INTAKE AND FUNCTIONAL CONSTIPATION IN WOMEN**

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**Rationale:** The aim of this study was to evaluate the relationship between anthropometric measurements and dietary intake and functional constipation in women.

**Methods:** The study was carried out on a total of 445 women aged 18–65 years who were selected by random sampling method. Data were collected by questionnaires prepared by the researchers using face-to-face interview technique. The constipation status of the women was evaluated according to the Roman IV criteria. Dietary intake was obtained from food frequency questionnaire (FFQ). In order to determine the severity of constipation the 'Constipation Severity Scale' was used. Anthropometric measurements (height, body weight, waist circumference) were measured. 'International Physical Activity Questionnaire Short Form' (IPAQ-SF) was used for the evaluation of physical activity status.

**Results:** The mean age of the participants was  $28.8 \pm 10.38$  years. The prevalence of functional constipation was 25.4%. Obese women had a higher prevalence of constipation compared with the ones who were overweight and normal (39.2%, 28.7%, 22.3% respectively). The prevalence of constipation in women with moderate active was 21.1%, while in women with inactive was 26.4%. Women with functional constipation were found to have lower dietary fiber and fluid intake compared to women without constipation. However, the difference was not statistically significant. A positive significant correlation was found between waist circumference and constipation severity ( $r = 0.156$ ,  $p = 0.001$ ). Logistic regression analysis showed that advancing age, increasing body weight, higher body mass index (BMI), higher waist circumference was significantly associated with a higher prevalence of functional constipation. Total fiber intake, fluid intake and physical activity level was not associated with constipation ( $p > 0.05$ ).

**Conclusions:** Functional constipation is common among women. Advancing age, having high body weight, higher BMI and higher waist circumference was associated with higher risk of functional constipation. Therefore, ensuring control of body weight and increasing physical activity may help in the prevention and management of functional constipation.

**Disclosure of Interest:** None declared.

#### SUN-PO150

##### EVALUATION OF DIETARY FIBER INTAKE AND GASTROINTESTINAL SYMPTOMS OF PATIENTS WITH IRRITABLE BOWEL SYNDROME

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**Rationale:** Irritable bowel syndrome (IBS) is a chronic functional bowel disease with no known etiology, characterized by lower and upper gastrointestinal symptoms such as changes in bowel habits (constipation/diarrhea), abdominal pain, dyspeptic complaints. Although there is no clear information about the type and amount of fiber in IBS, it is reported that soluble fiber may have positive effects in studies. In a systematic review of 17 clinical trials, it was stated that the effect of fiber in IBS is variable and insoluble fiber may worsen symptoms.

**Methods:** Seventy individuals (18 males, 52 females) between 20 and 55 years of age were included in the study. The research data were gathered by the researcher using face-to-face interviews with the patients using the 'survey method'. The fiber intake was determined using a 3-day dietary recording method. The 'Gastrointestinal Symptom Rating Scale' (GSRS) was used to assess the gastrointestinal symptoms.

**Results:** The mean age of the patients was  $37.8 \pm 10.03$  years. Mean body mass index of male patients was  $27.1 \pm 2.97$  kg/m<sup>2</sup>, while the mean BMI of female patients was  $26.6 \pm 5.81$  kg/m<sup>2</sup>. The fiber intake was calculated as  $21.8 \pm 10.7$  g in males and  $14.6 \pm 5.39$  g in females.

Most of the patients (72% of males and 73% of females) had insufficient fiber intake according to Dietary Reference Intakes. There was no statistically significant relationship between dietary fiber and GSRS scores (Table 1).

**Table 1**

Examination of the GSRS scores with dietary fiber intake

Fiber intake status	GSRS scores				
	Abdominal pain	Reflux	Diarrhea	Indigestion	Constipation
Inadequate	$r = 0,082$	$r = 0,005$	$r = -0,045$	$r = 0,019$	$r = 0,024$
Adequate	$p = 0,434$	$p = 0,963$	$p = 0,665$	$p = 0,852$	$p = 0,812$

**Conclusions:** There is no specific fiber recommendation for patients with IBS. The amounts determined by DRI also apply to IBS patients (38 g/day for an adult male, 25 g/day for female). In the studies, it was determined that IBS patients had dietary fiber intake lower than recommended. Because each fiber type does not affect symptoms of patients, a detailed nutrition history should be taken from individuals. As well as, fiber types that do not affect their symptoms should be included in their diet.

**Disclosure of Interest:** None declared.

#### SUN-PO151

##### NUTRITION-INFLAMMATION MARKERS AND SURVIVAL IN PATIENTS WITH CHRONIC ADVANCED KIDNEY DISEASE (ACKD)

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**Rationale: Objective.-** To assess the influence on the survival of ACKD patients according to nutrition-inflammation markers.

**Methods:** We have evaluated 214 patients with ACKD with age  $71.22 \pm 12.84$  years, 145 men (67.8%), 41.2% diabetics. We divided into 4 groups according to Albumin  $> 3.7$  and PCR  $< 1$ : G1 albumin  $< 3.7$  and PCR  $< 1$ , G2 albumin  $> 3.7$  and PCR  $< 1$ , G3 albumin  $< 3.7$  and PCR  $> 1$ , G4 albumin  $> 3.7$  and PCR  $> 1$ .

We compared inter-groups: malnutrition-inflammation score, visceral proteins, Hb, lymphocytes, CRP, body composition by BIA monofrequency AKERN. HD.01 and hand grip strength (baseline).. Likewise we established survival curves according to the established groups.

**Results:** We didnt found a difference between interoperability xage, xweight, xBMI, basal xmetabolisms, % TBW% fat mass, % lean mass, % muscle mass, BCMI or anthropometric parameters, xCKD-EPI and subjective global assessment.

We found significant intergroup differences in: MIS and VGO (0.000), nPNA (0.05), albumin and prealbumin (0.000), transferrin (0.001), lymphocytes (0.046), Hb and CRP (0.000), phase angle, Na / K, AIC and AEC (0.000). Hand grip strength right 0.021 and left 0.047.

In the survival study with Kaplan-Meier curves, considering the 4 groups, we found greater survival in G2 (Albumin  $> 3.7$  and PCR  $< 1$ ) compared to the rest of the groups, G3 being the lowest in survival (Albumin  $< 3.7$  and PCR  $> 1$ ). (long rank 0.005). Grouping the 4 groups into 2 according to PCR  $> 1$  and  $< 1$  and according to albumin  $>$  or  $< 3.7$ , significant differences are maintained with long Rank of 0.028 for PCR and 0.001 for albumin.



**Conclusions:**

1. There are significant differences between the scales of nutritional assessment, visceral proteins, biochemical and inflammation parameters, body composition and hand grip strength between the groups studied.
2. Albumin as a marker of nutrition modulated by inflammation and CRP as inflammation parameter appear as mortality markers alone or in combination in patients with CKD.

**Disclosure of Interest:** None declared.

**SUN-PO152****WHAT IS MORE IMPORTANT IN THE DIAGNOSIS OF SARCOPENIA STRENGTH, MUSCLE MASS OR FUNCTIONALITY?**

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**Rationale:** The criteria for the definition of sarcopenia have changed according to the European group of sarcopenia since 2018, considering muscle strength as the first tool to be assessed for the diagnosis of sarcopenia.

**AIM.** - Establish the prevalence of presarcopenia, sarcopenia and severe sarcopenia in a sample of 108 patients with advanced CKD.

**Methods:** To establish the diagnosis of presarcopenia if there is a decrease in muscle strength or Dinapenia less than 16 kg in women and 27 in men with a baseline dynamometer. Decrease in muscle mass if SMM / height<sup>2</sup> <6.57 in women and 8.83 in men (BIA Bodygramplus, and increase in pace with 6mwtest if it is >0.8 m/sec.

**Results:** We evaluated 108 patients with advanced CKD (CKD-EPI <30 ml/min/1.73 m<sup>2</sup>, Xage 70.55±11.60 (33–94), 72males and 36females. We found the difference between them, We found 42 patients with presarcopenia 38.8% 24 males and 18 females. Of them had Sarcopenia = SMM/size<sup>2</sup> low 24 patients, 6males and 18 females. Finally, with gait speed >0.8 m/sec of the sarcopenic 5 patients, 4.62%, which would constitute the group of severe sarcopenia.

**Conclusions:**

1. The ERC prospects metabolic alterations that can diminish the strength and/or muscle mass
2. Preserved muscle mass does not always imply good muscular strength.
3. The hand grip strength appears as the main tool to measure sarcopenia.
4. The loss of functionality with lengthening of the gait speed would give us severity or functional repercussion of sarcopenia.
5. Muscle strength decreases with age but it improves with physical exercise what should be considered in these patients.

**Disclosure of Interest:** G. Barril Speakers Bureau of: Abbot, Nutricia, Viphor Fresenius, A. Nogueira: None declared, G. Alvarez: None declared, D. Sapiencia: None declared, N. Andres: None declared, A. Nuñez: None declared, C. Sanchez: None declared, J. A. Sanchez Tomero: None declared.

**SUN-PO153****THE CLINICAL VALUE OF SITAGLIPTIN, A DIPEPTIDYL PEPTIDASE-4 INHIBITOR, IN PATIENTS WITH SHORT BOWEL SYNDROME AND COLON IN CONTINUITY: AN OPEN-LABEL PILOT STUDY**

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**Rationale:** Patients with short bowel syndrome (SBS) and colon in continuity have better potential for intestinal adaptation compared to patients with jejunostomies due to enhanced endogenous responses of glucagon-like peptide (GLP)-1, GLP-2, and peptide YY which are normally degraded by dipeptidyl peptidase-4 (DPP-4). Treatment with GLP-2 has been shown to improve intestinal absorption in a small number of these patients who suffer from high-volume fecal output. We aimed to evaluate the efficacy of sitagliptin, a DPP-4 inhibitor, on fecal wet weight in this patient group.

**Methods:** In an open-label, proof-of-concept pilot study, 100 mg oral sitagliptin was given twice daily for 8 weeks to patients with SBS and ≥50% of colon in continuity with intestinal insufficiency (II) or failure (IF). To assess intestinal function, metabolic balance studies were performed at baseline and at the end of treatment.

**Results:** Of the eight patients treated with sitagliptin seven patients (SBS-II: n = 3; SBS-IF: n = 4) completed the trial. Although postprandial endogenous GLP-2 concentrations increased in all patients by a median (range) of 49 h×pmol/L (39 to 105), sitagliptin did not significantly reduce median fecal wet weight (−174 g/day (−1510 to 675)) or increase intestinal wet weight absorption (223 g/day (−514 to 847)) (Table 1). However, heterogeneity in the treatment effect was observed: six out of seven patients reduced their absolute fecal wet weight ranging from −1510 to −10 g/day. Intestinal wet weight absorption increased in all patients with SBS-IF. One patient achieved a reduction in parenteral support of 500 ml per administration day.

**Table 1**

Results from metabolic balance studies. A Wilcoxon signed-rank test was used for the statistical analyses. P < 0.05 was considered statistically significant. Data are presented as median (min, max).

	Baseline	Treatment	Change	P-value
Dietary wet weight intake (g/day)	3022 (1737, 4353)	3183 (1730, 4208)	−7 (−663, 276)	0.672
Fecal wet weight (g/day)	1087 (383, 3480)	1135 (153, 3183)	−174 (−1510, 675)	0.176
Intestinal wet weight absorption (g/day)	1523 (−360, 3267)	1747 (90, 3132)	223 (−514, 847)	0.398

**Conclusions:** Larger placebo-controlled studies are needed to establish the role of DPP-4 inhibitors in the treatment of patients with SBS.

**Disclosure of Interest:** None declared.

**SUN-PO154****IMPROVEMENT IN FRAILTY STATUS AFTER PULMONARY REHABILITATION IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE**

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**Rationale:** Prevalence of frailty in outpatients with Chronic Obstructive Pulmonary Disease (COPD) is high, i.e., 22–58%. Frailty has a multidimensional character with physical, psychological, and social domains. Since pulmonary rehabilitation (PR) includes nutritional, exercise, and psychosocial interventions, PR may improve frailty status. In this study, we aimed to assess the change in prevalence and frailty score during PR in patients with COPD.

**Methods:** Before and after a 9-week PR program, frailty was assessed by the multidimensional Evaluative Frailty Index for Physical Activity (EFIP), which includes the physical, psychological, and social domains. A patient was considered frail if EFIP score >0.25. The Wilcoxon sign test was used for not normally distributed data and for ordinal data. The McNemar test was used for binary data.

**Results:** Longitudinal data on the EFIP were complete in 59 patients (72%) (60.9 ± 9 years; 48% male; Forced Expiratory Volume in 1 second 39% predicted). EFIP score decreased from 0.34 pre-PR to 0.28 post-PR ( $p < 0.001$ ). Score on the physical domain decreased from 0.27 to 0.22 ( $p = 0.021$ ), on the psychological domain from 0.26 to 0.22 ( $p = 0.011$ ), on the social domain from 0.34 to 0.28 ( $p = 0.011$ ), and on the health domain from 0.46 to 0.38 ( $p < 0.001$ ). Also, the prevalence of frailty decreased from 85% to 61% ( $p < 0.001$ ).

**Conclusions:** After PR, prevalence of frailty in this group of COPD patients is substantially lower than at the start of PR. Improvements in frailty status are visible in the physical, psychological, and social domains. The findings of our study underscore the dynamic character of frailty.

**Disclosure of Interest:** None declared.

#### SUN-PO155

##### ENTERAL NUTRITION CONTAINING COLLAGEN PEPTIDE PROMOTES SKIN WOUND HEALING BY ENHANCING COLLAGEN SYNTHESIS

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**Rationale:** Collagen peptide intake has been shown to promote the healing of pressure ulcers. We developed a liquid enteral nutrition product that contains collagen peptide (CP-EN). We performed two separate studies to investigate the effects of CP-EN on skin wound healing in diabetic model rats and to assess the effects of CP, which is the collagen peptide used in CP-EN, on collagen synthesis in vitro.

**Methods:** Male Sprague-Dawley rats were intravenously injected with streptozotocin (50 mg/kg body weight) to induce diabetes. Two weeks later, two full-thickness skin wounds were created on the back of each rat, and they were fed either CP-EN or NCP-EN (general commercial enteral nutrition product not containing collagen peptide) for 14 days. We measured the epithelial gap and neutral salt-soluble type I collagen (NSC) levels in the wound area on days 7 and 14 post-wounding. Additionally, we performed an in vitro study to assess the effects of CP on human dermal fibroblasts. For this, normal human dermal fibroblasts (NHDF) were incubated with CP for 48 hours and procollagen type I C-peptide (PIP) levels were measured in the cultured medium after incubation.

**Results:** Skin NSC levels were significantly increased in the CP-EN group compared to the NCP-EN group on day 7. There was a significant decrease in the size of the epithelial gap in the CP-EN group versus the NCP-EN group on day 14. Furthermore, there was a significant increase in PIP content in the NHDF after treatment with CP.

**Conclusions:** Our data suggest that CP-EN intake might enhance skin wound healing compared with general enteral nutrition products that don't contain collagen peptide. Furthermore, collagen peptide supplementation via CP-EN intake might positively affect dermal fibroblast collagen synthesis.

**Disclosure of Interest:** H. Yamashita Other: Employed by Otsuka Pharmaceutical Factory, Inc., S. Miki Other: Employed by Otsuka Pharmaceutical Factory, Inc., G. Ebisu Other: Employed by Otsuka Pharmaceutical Factory, Inc.

#### SUN-PO156

##### DOES THE PRO-INFLAMMATORY DIETARY PATTERN STROKE UP THE INFLAMMATION FIRE IN TYPE 2 DIABETES MELLITUS AS IMPOSING UNDESIRABLE VITAMIN D STATUS?

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**Rationale:** Low-grade systemic inflammation which provides the substrate for many chronic diseases such as obesity, cardiovascular disease, and type 2 diabetes (T2DM) is also influenced by environmental factors and genetic background. Though it is now well recognized that vitamin D deficiency is associated with T2DM, the possible relationship between diet-related inflammation and the risk of diabetes has been investigated recently. In the present study, the linkage between vitamin D status and inflammatory potential of diet was examined in type 2 diabetic participants.

**Methods:** The study consisted of 119 type 2 diabetics (93 female, mean age 54.7 ± 8.4 years) who were admitted to a university endocrinology department in Turkey. Serum 25(OH)D level was measured by high performance liquid chromatography (available for 112 patients). Vitamin D deficiency was defined as a 25(OH)D level <20 ng/ml (50 nmol/L). The dietary inflammatory index (DII) was computed using two days of 24-hour recall data. Lower DII scores indicate a lower inflammatory potential of the diet<sup>1</sup>. The study population was divided into three subgroups according to their DII tertiles (Tertile 1: <0.54, Tertile 2: 0.54–2.02, Tertile 3: >2.02). Pearson's chi-squared test and Mann-Whitney U test were used to describe the relationships between variables. Statistical significance was accepted as  $p < 0.05$ .

**Results:** Significant increasing trends across the tertiles of DII were observed for prevalence of vitamin D deficiency. For instance, vitamin D deficiency has been reported to occur in 48.6% of Tertile 1, 57.9% of Tertile 2 whereas it was identified in 78.4% of Tertile 3 ( $p = 0.027$ ). The mean DII score was  $0.42 \pm 1.14$  (min: - 2.48, max: 3.06) among patients who have vitamin D deficiency ( $n = 69$ ), whereas the mean DII score was  $- 0.12 \pm 1.04$  (min: - 2.01, max: 1.90) among patients ( $n = 43$ ) with adequate vitamin D levels ( $p = 0.011$ ).

**Conclusions:** Further investigations are needed to explain how this relationship between dietary pattern and vitamin D status contributes to the inflammatory mechanism of T2DM.

#### Reference

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**Disclosure of Interest:** None declared.

### SUN-PO157 EFFECT OF A SPECIALIZED NUTRITION FORMULATION IN AN ANIMAL MODEL OF ALZHEIMER'S DISEASE

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**Rationale:** Nutritional factors influence the risk of developing Alzheimer's disease (AD) and its rate of clinical progression. In rodents, models mimicking AD, can be used to study whether nutrition can improve cognitive alterations. One of these models, the applying of intracerebroventricular (ICV) streptozotocin (STZ), culminate in a neuroinflammatory picture with cognitive alteration.

**Methods:** Rats were randomly divided into two groups: sham and STZ. STZ group received a single bilateral ICV injection of STZ (1 mg/kg total dose) dissolved in sterile 0.9% saline. Sham group received a single bilateral ICV injection of 0.9% saline. Treatment with an antioxidant and anti-inflammatory nutritional formulation (AZ) (1 g/kg, per os) or its vehicle (0.9% saline) was performed over 30 days, once a day (n = 6–10 per group). The animals were assessed in the open field test (OFT) to evaluate locomotor activity (day 27). Cognitive performance was evaluated (day 28), in the object recognition test (ORT) and in the spatial version of the Y maze. On day 30, they were deeply anesthetized and intracardially perfused for the immunohistochemical of doublecortin (DCX; marker of newborn and migrating neurons) and Iba-1 (microglial activation marker). Group differences were analyzed using one way analysis of variance (ANOVA) with Bonferroni's post-hoc test, with  $p < 0.05$  (significant).

**Results:** Locomotor activity in the OFT did not reveal any changes in the locomotion parameters in all of the groups. STZ-lesioned rats showed a reduction in memory process in both ORT and Y maze. Besides, an increase in IBA-1 in the CA1 and CA3 (region of hippocampus). Most importantly, the treatment with AZ formulation was able to reverse the memory impairment observed in the ORT and Y maze and also reduced IBA-1 in the CA-1 and gyrus dentatus region of hippocampus.

**Conclusions:** STZ-lesioned rats present a memory impairment besides the increase in microglial activation. The prolonged treatment with AZ formulation was able to counteract these changes.

**Disclosure of Interest:** E. Moura Grant / Research Support from: Prodiat Clinical Nutrition, T. Bassani: None declared, H. dos Santos Grant / Research Support from: Prodiat Clinical Nutrition, M. Vital: None declared.

### SUN-PO158 FISTULA DAY 2018 CURRENT STATUS OF THE POSTOPERATIVE FISTULA OF THE DIGESTIVE TRACT. MULTI-CENTER, MULTINATIONAL STUDY

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**Rationale:** In our Unit of practice integrated in Intestinal Failure working in collaboration with the Latin American Federation of Parenteral and Enteral Nutrition (FELANPE) we designed a database of this adverse event with the objective of knowing the results in the medical-nutritional and surgical therapy in a prospective multicenter-

multinational, descriptive and analytical study with a 60-day follow-up.

**Methods:** The first cohort of hospitalized patients with a diagnosis of leak and/or postoperative fistula of the gastrointestinal tract was performed on May 9, 2018. The follow-up of these patients was 2 months. Patient care was not intervened in any way. The informed consent of the participating hospitals was obtained.

**Results:** The postoperative fistula was presented after elective surgery in 68.9% of the cases while 31.1% was after emergency surgery. In 176 patients who completed the follow-up at 2 months, we found a mortality of 21.46% (38 patients), of these, 48% (18 patients) presented symptoms of anastomotic leak during the first 5 days. The location of the fistula with the highest mortality was Small Intestine.

Of the 38 patients who died, 15 cases developed FEAT.

**Conclusions:** The prevalence of this adverse event in the postoperative period of gastro-intestinal surgery continues to be high and as a clinical entity with different stages, diagnosis is difficult and treatments are of wide variability.. It is urgent the standardization of clinical scenarios, the creation of integrated practice units in intestinal failure for the attention of this high cost adverse event.

**Disclosure of Interest:** None declared.

### SUN-PO159 RISK FACTORS AND EVOLUTION OF WEIGHT LOSS IN PARKINSON'S DISEASE: A NINE YEAR POPULATION-BASED STUDY

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**Rationale:** Weight loss (WL) is a often under-recognised and under-diagnosed complication in Parkinson's disease (PD), which is surprising given the clinical characteristics and a variety of symptoms that may affect nutrition status. The aim of this study was to determine the frequency, evolution and risk factors of WL in a representative incident PD cohort.

**Methods:** In this prospective population-based study, we followed 185 incident and initially drug-naïve PD patients and 172 age- and sex-matched controls with repetitive weight examinations at baseline and 1, 3, 5, 7 and 9 years of follow-up. We used Andersen-Gill model to identify risk factors of short-term WL (>10% WL in two years) and multivariable Cox proportional hazards model in the long-term perspective (>10% WL during the entire study period).

**Results:** Mean % weight change during the study period was -3.8 (±11.0) in patients and -1.3 (±7.9) in controls ( $p = 0.015$ ). Long-term WL was more common in PD than controls (25.9% vs. 10.1%, relative risk 2.56;  $p < 0.001$ ). Predictive risk factor for both short- and long-term WL adjusted for demographics were dyskinesias (hazard ratios (HRs) 2.25 [95% confidence interval 1.15–4.42] and 2.94 [1.45–5.93]  $p = 0.02$  and  $< 0.01$ ), age (1.04 [1.01–1.07] and 1.06 [1.03–1.10] both  $p < 0.01$ ) and cognitive impairment (0.94 [0.89–0.99] and 0.89 [0.81–0.97]  $p = 0.03$  and  $0.01$ ). In addition, short-term WL was predicted by Unified Parkinson's disease rating scale motor score (1.02 [1.00–1.05]  $p = 0.04$ ), while olfactory impairment predicted long-term WL (2.52 [1.19–5.31]  $p = 0.02$ ).

**Conclusions:** WL is frequent in the general PD population and associated with both disease-related features and drug-related



complications. This suggests a complex nature of WL in PD, which is important to take into consideration in clinical practice.

## References

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## SUN-PO160

### SICCA SYMPTOMS, DIETARY RESTRICTIONS AND NUTRITIONAL STATUS IN SJOGREN'S SYNDROME

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**Rationale:** Primary Sjogren's Syndrome (pSS) is a systemic autoimmune disease characterized by the presence of sicca symptoms. Mouth dryness is associated with change on the flora, and infections, and teeth disease and loss. This, as well as the disease symptoms, have a vast impact on the patients eating habits. As far as we know, no one has attempted to evaluate its influence on nutritional risk.

The aim of this work is to evaluate the impact of dry mouth, on dietary habits and nutritional risk on pSS patients.

**Methods:** Questionnaires were developed to assess the patient's severity of dry mouth and oral disease, as well as their dietary habits change due to the disease. Data regarding disease characteristics and nutritional risk using the MUST scale were also collected.

**Results:** Data from 25 patients attending the Sjogren's clinic were analyzed, yielding a female preponderance (88%), with a mean age of 60 years old. pSS disease duration was on average 10,7 years, antibody positivity of 40% and 36% for anti-Ro and anti-La, respectively. As for disease scores, ESSDAI mean was  $2,7 \pm 5,2$  and ESSPRI  $5,7 \pm 2,7$ .

Concerning oral dryness, 68% experienced dryness, with 44% causing dysphagia, and 36% required moistening of the food and/or artificial saliva use, but only 8% using pilocarpine. As for oral health, 32% had experienced oral infections, 28% dental loss and 28% taste changes in food. The majority (60%) was using fluoride products to protect the teeth decay, but 40% had already prosthesis. There was no relationship between this and disease characteristics or demographics.

Regarding the patient eating habits: 32% related reduced food intake due to pSS. The most avoided types of food were acidic (87,5%), spicy (75%), sugary (62,5%) and sticky (50%). Pasta and meat/fish intake were reduced in 25% and vegetables in 12,5% of patients. There was a marginal relationship (not statistically significant) between reduced food intake and age and Anti-Ro.

As for the nutritional status of this sample. BMI average was 28, with 70% overweight and above. MUST stratification identified 18% as at risk.

**Conclusions:** Oral dryness and disease are very important in pSS. Its impact on food intake has never been addressed, however, our questionnaire reveals that some patients avoid eating certain types of food. These relate to foods that worsen dryness or have negative effects on dental health. The relationship to age is probably due to the overall effects of aging on the reduction of food taste or eating

pleasure. The not statistically significant association with anti-Ro antibody requires a bigger sample size to understand.

Even though the nutritional risk wasn't alarming, it was still relevant with an 18% incidence, therefore raising the importance of screening patients. Further studies may help to find risk and prognostic factors. More importantly, the high prevalence (70%) of overweight. These patients are at increased cardiovascular risk due to its inflammatory condition and drugs.

The main bias are the small sample size, and the lack of a matched control group to infer if the features are exclusive to pSS. Future work will involve more patients, but also a more extensive food diary.

**Disclosure of Interest:** None declared.

## SUN-PO161

### ASSOCIATION BETWEEN BODY COMPOSITION AND PROGNOSIS OF PATIENTS ADMITTED BECAUSE OF ACUTE PANCREATITIS

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**Rationale:** We investigated the association between muscle and visceral fat mass with prognosis of patients hospitalized with acute pancreatitis (AP).

**Methods:** Included in this retrospective analysis were patients admitted with AP between 2008 and 2014. Body composition analysis (Sliceomatic, Tomovision, CA) was performed on CT images at the L3 level. Regression analysis was used to examine the effect of body composition on 1-year mortality as well as 1-year readmission rates.

**Results:** A total of 158 patients were enrolled in our study (age  $63,7 \pm 17,4$  years, 57,6% male predominance). Fat was the most abundant tissue ( $408 \pm 180$  cm<sup>2</sup> surface area). Age was the only prognostic factor that had a tendency to affect 1-year mortality rates (HR 1.051, 95% CI 0.993–1.112,  $p = 0,087$ ). Low muscle mass and low visceral fat were associated with significant increase in re-admissions rate (1.7 vs. 1.1,  $p = 0,018$ ; 1.6 vs. 1.1,  $p = 0,087$ , respectively). Regression analysis showed that high visceral fat was associated with reduced 1-year re-admission rates (OR 0.995, 95% CI 0.991–1.000,  $p = 0,034$ ). Visceral fat mass was also associated with reverse correlation with the number of 1-year re-admissions (HR  $-0,004$ , 95% CI  $-0,008$ – $0,000$ ,  $p = 0,070$ ).

**Conclusions:** High visceral and muscle mass were good prognostic criteria for patients admitted with acute pancreatitis. These results suggest the importance of nutritional rehabilitation in patients after admission due to AP.

**Disclosure of Interest:** None declared.

## SUN-PO162

### SEX DIFFERENCE IN THE ASSOCIATION BETWEEN MALNUTRITION AND HYPOGLYCEMIA IN HOSPITALIZED PATIENTS

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**Rationale:** To examine the difference between males and females regarding association between malnutrition risk and hypoglycemia.

**Methods:** The study design is a subgroup analysis of a cross-sectional analysis of newly admitted patients to internal medicine departments at Wolfson Medical Center in Israel.

Malnutrition risk, assessed with Nutritional Risk Screening 2002 (NRS2002), and serum albumin were measured upon admission. Logistic regression was applied to men and women separately, to test the effect of malnutrition and hypoalbuminemia on incidence of hypoglycemia.

**Results:** Included were 1185 patients (50.4% males, 39.2% with positive NRS2002). Rate of high malnutrition risk was similar across sexes (37.4% vs. 41.2% in males and females respectively,  $p=0.186$ ). Within NRS2002 negative males, rate of hypoglycemia was 7.1%, compared to 9.2% in NRS2002 positive males ( $p=0.520$ ). However, within NRS2002 negative females, rate of hypoglycemia was 2.4% compared to 9.5% in NRS2002 positive females ( $p<0.001$ ). NRS component analysis found that the weight loss/decreased food intake criterion was significantly higher in the hypoglycemic group within females ( $p=0.03$ ). Logistic regression showed that serum albumin level was inversely associated with hypoglycemia in both female (OR 0.491, 95% CI 0.264–0.914) and male populations (OR 0.385, 95% CI 0.234–0.633). However, increased malnutrition risk was significantly associated with hypoglycemia only among females (OR 3.915, 95% CI 1.592–9.627). Diabetes status was associated with hypoglycemia (OR 2.784, 95% CI 1.417–5.469) only in males; this association did not occur in females.

**Conclusions:** Malnutrition risk, as measured by the NRS2002, is associated with significantly increased incidence of hypoglycemia in women alone. Females who lose weight prior to hospitalization have an increased risk to develop hypoglycemia.

**Disclosure of Interest:** None declared.

#### SUN-PO164

##### CRACKING THE CODE OF THE OBESITY SURVIVAL PARADOX IN CHRONIC HAEMODIALYSIS PATIENTS

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**Rationale:** Chronic haemodialysis (HD) patients with a high body mass index (BMI) have been shown to have a survival advantage, and strong predictive correlation to decreased all-cause mortality. The paradoxical observation, named the obesity survival paradox was first reported in the 1970's; the benefit mechanism has eluded scientists for over four decades. The objective of this study was to assess whether there is a significant difference in the 3rd water space between the subjects with a higher body fat percentage and body mass index (BMI) compared with their leaner counterparts.

**Methods:** A prospective, non-randomized observational study was conducted. Repeated measures of 24 bioelectrical impedance analysis pre- and post-HD measurements were conducted over three months on 23 chronic HD subjects (50% male; ages 21–63 years) at the King Edward VIII Hospital HD unit.

**Results:** Patients with a body fat percentage of  $\geq 30\%$  and a BMI  $\geq 28$  kg/m<sup>2</sup> had a negative 3rd water space, compared to those with lower body fat percentage and BMI. The difference between the two groups was statistically significant ( $p=0.000^*$ ).

**Conclusions:** Previous studies have shown persistent excess fluid in the 3rd water space causes progressive soft tissue damage, cardiac failure and brain cell damage in chronic HD patients. This study findings suggest there is a potential benefit (lower 3rd water space) of a higher body fat percentage and BMI in patients on chronic HD, in contrast to the conventional perception of a healthy BMI and body fat, namely, a BMI between 19 and 25 kg/m<sup>2</sup>, and body fat percentage between 15 and 20%. The results of such a study may be pivotal in changing the dietary management of chronic HD patients. Current practice of aiming for a 'healthy' body fat percentage and BMI maybe deleterious, as it has a direct impact on the risk for mortality, and long-term survival in chronic HD patients.

**Disclosure of Interest:** None declared.

#### SUN-PO165

##### POLYUNSATURATED FATTY ACID STATUS IN INDIVIDUALS WITH POLYCYSTIC OVARIAN SYNDROME

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**Rationale:** Polycystic ovarian syndrome (PCOS) is a leading cause of female infertility. PCOS patients are more susceptible to develop insulin resistance, with hyperinsulinemia known to aggravate reproductive dysfunction. Polyunsaturated fatty acids (PUFAs), have been shown to improve metabolic parameters. The purpose of the study was to investigate the PUFA status in women with PCOS.

**Methods:** A cross-sectional case-control study was conducted ( $n=77$ ). The study group ( $n=39$ ) was women with PCOS and infertility, and a control group ( $n=38$ ). Demographic information, anthropometric parameters, medical-, supplement-, and fertility history, three-day food intake records and plasma and red blood cell membrane phospholipid fatty acid composition were compared between groups. Independent t-tests, Levene's test and analysis of variance were used to analyse the data.

**Results:** Dietary intake was significantly higher in the control group for docosahexaenoic acid (C22:6n3 DHA;  $p=0.043$ ) and docosapentaenoic acid (C22:5n3 DPA;  $p=0.029$ ), and higher for eicosapentaenoic acid (C20:5n3 EPA;  $p=0.062$ ). The plasma phospholipid omega-6:omega-3 ratio (n-6:n-3) was higher in women with PCOS as was the plasma phospholipid n-6:n-3 long-chain PUFAs (LC-PUFAs) ratio compared to the control group when adjusted for possible confounding of PUFA supplementation ( $p=0.039$ ) and PUFA supplementation with endometriosis ( $p=0.048$ ). Plasma phospholipid n-3 fatty acids were higher in the control compared to the study group for DHA ( $p=0.029$ ), total n-3 PUFAs ( $p=0.036$ ) and n-3 LC-PUFAs ( $p=0.036$ ). Plasma phospholipid fatty acids with a significantly higher concentration in the study group were stearic-, elaidic-, mead- and dihomo-gamma-linolenic acid.

**Conclusions:** Women with PCOS and infertility presented with significantly lower plasma phospholipid n-3 PUFAs (in particular DHA), and consequently a higher n-6:n-3 PUFA ratio compared to controls. These results probably reflect the dietary intakes of DHA, DPA and EPA that was lower in women with PCOS. Plasma phospholipid fatty acid profiles differed between women with PCOS and controls, and may provide a complementary approach to the treatment of PCOS.

**Disclosure of Interest:** None declared.

**SUN-PO166****LONG TERM PARENTERAL NUTRITION IMPAIRS LUNG BARRIER FUNCTION, DISTURBS PULMONARY MICROBIOTA AND INDUCES BACTERIAL TRANSLOCATION IN A MOUSE MODEL OF TOTAL PARENTERAL NUTRITION**

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**Rationale:** Long term parenteral nutrition (PN) is always associated with increased incidence of pulmonary complications including pneumonia and pulmonary thromboembolism, which limited its clinical application. However, few studies have focused on parenteral nutrition associated lung injury, and the impact of parenteral nutrition on lung barrier function impairment remains unclear.

**Methods:** Cannulated male C57BL/6 mice at the age of 10–12 weeks were randomized to chow or PN group. Mice in PN group were given continuous total parenteral nutrition for 7 and 14 days, respectively. Severity of lung injury, lung barrier function, pulmonary microbiota in bronchoalveolar lavage and bacterial translocation were measured.

**Results:** Compared with mice in the chow group, total parenteral nutrition significantly increased the severity of lung injury and impaired the lung barrier function. The expression of tight junction protein (ZO1 and Occludin) was significantly decreased and ultra-structure damaged with the prolonged usage of PN. The pulmonary microbiota analysis revealed that the number of actinomycetes and firmicutes phylum significantly increased, and bacteroidetes phylum decreased, as well as subordinate categories ( $p < 0.01$ ). Bacterial translocations in lung were observed by fluorescence in situ hybridization. The longer parenteral nutrition was used, the more serious impairment of lung barrier was observed.

**Conclusions:** Long term parenteral nutrition had a damaged effect on lung barrier function, pulmonary microbiota homeostasis and bacterial translocation in a mouse model of total parenteral nutrition.

**Disclosure of Interest:** None declared.

**SUN-PO167****AUTOPHAGY PROTECT AGAINST THE IMPAIRMENT OF LUNG BARRIER FUNCTION IN A MOUSE MODEL OF TOTAL PARENTERAL NUTRITION**

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**Rationale:** Parenteral nutrition is an important life-saving strategy in clinical practice for patients with intestinal failure. However, the long term usage of parenteral nutrition is always associated with increased incidence of pulmonary complications including pneumonia and pulmonary thromboembolism, which limited its clinical application. Previous studies have pointed out that autophagy suppression may be an important mechanism for parenteral nutrition associated complications, but its role in parenteral nutrition associated lung injury is still unclear.

**Methods:** Cannulated male C57BL/6 mice at the age of 10–12 weeks were randomized to chow, PN, PN+ rapamycin (PN+RA), or chow+ rapamycin (chow+ RA) for 7 days. Severity of lung injury, lung barrier

function, level of autophagy, reactive oxygen species (ROS), lung apoptosis, and inflammatory signaling pathway were measured.

**Results:** Parenteral nutrition caused increased severity of lung injury and autophagy suppression, which demonstrated by the decreased light chain 3 fluorescence (LC3) II/I ratio and increased p62 protein accumulation. Fewer autophagosomes and intact mitochondria in lung were observed by transmission electron microscopy detection. Long term parenteral nutrition can also activated the apoptosis level and inflammatory HMGB1/RAGE/NF- $\kappa$ B signaling pathway. The intervention of exogenous rapamycin can reduce the impairment of lung barrier, lower the level of ROS, reduce apoptosis and inhibit inflammatory signaling by upregulation of autophagy.

**Conclusions:** Autophagy suppression induced by parenteral nutrition was an important mechanism in inducing the impairment of lung barrier. Clinically, drugs that aimed to up-regulate autophagy may be a potential mechanism for alleviating parenteral nutrition associated complications.

**Disclosure of Interest:** None declared.

**SUN-PO168****MODIFICATION IN THE PHASE ANGLE AND BODY COMPOSITION IN MALNOURISHED PATIENTS: EFFECT OF SUPPLEMENTATION WITH SPECIFIC, ENRICHED IN  $\beta$ -HYDROXY  $\beta$ -METHYL BUTYRATE CALCIUM**

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**Rationale:** Caloric protein malnutrition associates changes in body composition and function that are related to an increase in morbidity and mortality. The nutritional intervention tries to recover this parameter in the malnourished patient.

The phase angle (FA) is considered a global prognostic factor that informs about cellular functionalism and therefore in relation to body composition.

**OBJECTIVES:** To assess the clinical response (FA, Standardized FA, nutrition and hydration and body composition in a group of malnourished patients) subjected to a nutritional intervention during a period of 3–6M. We treat patients with a nutritional supplement. enriched in  $\beta$ -hydroxy  $\beta$ -methyl butyrate calcium (HMB).

**Methods:** Prospective study of nutritional intervention  $n = 31$ , where analytical determinations (albumin, prealbumin, RCP), nutritional (anthropometric parameters, FA, standardized FA) are performed. Intake and nutritional support records, during a follow-up period of 3–6 Months.

**Results:** 31 patients,  $59.6 \pm 13.8$  years, 45% males.

There is an improvement in the FA of  $0.83^\circ$  with maintenance of the degree of hydration (TBW/FFM) and increase in the nutritional status  $78.8$  (mg 24 h/htm)

The mean weight was  $69.3 \pm 12.7$ . There is an increase in weight of 3.3 kg in 6 Months of intervention with improvement in the body cell mass (BCM) and muscle function (dynamometry)

There is an improvement in protein parameters with recovery of albumin and prealbumin and decrease in inflammatory pattern (CRP),

**Conclusions:** A significant improvement was observed in the parameters of function and cellular composition associated with the nutritional intervention enriched in  $\beta$ -hydroxy  $\beta$ -methyl butyrate calcium (HMB). Weight gain and recovery of the nutritional and



inflammatory analytical parameters are important for the nutritional evolution and global prognosis of patients.

**Table 1**

PARAMETER	BASAL	FINAL
WEIGHT (Kg)	60,5 ± 10,8	63,9 ± 11,6*
BMI (Kg/m <sup>2</sup> )	22,0 ± 3,2	23,2 ± 3,5*
FA Estandardized (°)	-0,9 ± 1,1	-0,7 ± 0,9*
TBW(L)	36,6 ± 6,6	36,5 ± 6,6
ECW(L)	18,0 ± 3,2	16,7 ± 3,1*
ICW(L)	18,3 ± 4,7	19,8 ± 4,4*
FFM(Kg)	49,0 ± 8,8	49,5 ± 9,5
FM(Kg)	11,4 ± 5,5	13,1 ± 6,5*
BCM(Kg)	24,2 ± 6,8	26,8 ± 6,0*
ASMM(Kg)	18,3 ± 4,2	18,7 ± 4,0
SMI(Kg/m <sup>2</sup> )	8,7 ± 1,7	8,5 ± 1,7
DYNAMOMETRY)(Kg)	24,7 ± 11,2	30,0 ± 11,0*
ALBUMIN(g/dl)	3,2 ± 0,6	4,0 ± 0,6*
PREALBUMIN(mg/dl)	19,4 ± 5,5	24,9 ± 6,9*
CRP(mg/l)	9,2 ± 13,5	3,2 ± 0,7*

(TBW total body water, ECW extracellular water, ICW intracellular water, FFM fat free mass, FM fat mass, BCM body cell mass, ASMM appendicular skeletal muscle mass, SMI skeletal muscle mass index, CRP protein C reactive.

**Disclosure of Interest:** None declared.

#### SUN-PO169

##### WAIST-TO-HIP RATIO IS REFLECTION OF HIGHER FAT CONTENT AND CORRELATED WITH CARDIOVASCULAR RISK FACTORS IN RENAL TRANSPLANT RECIPIENTS

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**Rationale:** Previous studies in adults revealed that the waist-to-hip ratio (WHR) is equivalent to or slightly better than waist circumference (WC) and superior to body mass index (BMI) in predicting higher cardiometabolic risk. The aim of this cross-sectional study was to analyse correlations between WHR and other anthropometric parameters, blood pressure and laboratory parameters and other clinical parameters among Dalmatian renal transplant recipients (RTRs).

**Methods:** 89 RTRs, 48 (53.93%) men and 41 (46.07%) women, aged 59.31 years were included. For each RTRs patient data about number and type of antihypertensive drugs, age, gender, weight and height were collected. Also, serum urea, creatinine, glucose, triglyceride, total cholesterol and low density cholesterol level, were measured and body mass index (BMI) and glomerular filtration (GF) was calculated. The Agedio B900 device was used to measure arterial pressure (peripheral and central systolic as well as peripheral and central diastolic arterial pressure) and parameters of arterial stiffness (pulse wave velocity (PWV) and augmentation Index (Aix). Furthermore, Tanita MC780 Multi Frequency segmental body composition analyser was used to measure content of body fat, muscle mass and visceral fat.

**Results:** Statistically positive correlations between WHR, BMI, glucose and triglyceride level were found ( $p = 0.005$ ), ( $p < 0.001$ ), ( $p = 0.027$ ), ( $p = 0.005$ ), respectively. Also, statistically positive correlation between fat mass (kg), fat mas (%) and visceral fat (kg) was found ( $p < 0.001$ ), ( $p < 0.001$ ), ( $p < 0.001$ ), respectively. Furthermore,

those patients with higher WHR had statistically lower muscle mass (%) ( $p < 0.001$ ), higher systolic blood pressure ( $p = 0.038$ ) and higher PWV ( $p = 0.038$ ). RTRs with diabetes ( $p = 0.05$ ) and resistant hypertension ( $p = 0.032$ ) had statistically higher WHR.

**Conclusions:** These correlations suggested that WHR is reflection of fat content and correlated with cardiovascular risk factors (BMI, systolic blood pressure, PWV, glucose and triglyceride level). WHR could be screening tool for obesity and related cardiometabolic risks for RTRs in everyday clinical practice.

**Disclosure of Interest:** None declared.

#### SUN-PO170

##### IMPACT OF PERCUTANEOUS ENDOSCOPIC GASTROSTOMY (PEG) ON THE EVOLUTION OF THE DISEASE IN PATIENTS WITH AMIOTROPHIC LATERAL SCLEROSIS (ALS)

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**Rationale:** Patients with Amyotrophic Lateral Sclerosis (ALS) has high risk of dysphagia and they may need gastrostomy in its evolution. The aims of this study were: a) To describe anthropometry at the beginning of the nutritional follow-up. b) Rate of complications between patients with and without PEG and the influence of the moment of implantation on them. c) Evaluate survival based on the implantation of PEG.

**Methods:** An interhospital registry was created for the eleven hospitals of Castilla y León through a web platform. They were evaluated on data on disease evolution, nutritional history and subjective global assessment (VGS). We compared the data of those in which PEG was implanted and those that did not and between those in which PEG was implanted before (less than 10 months after diagnosis) with respect to those that were implanted later.

**Results:** A total of 93 patients from 6 hospitals in Castilla y León were analyzed. In 38 patients (38.8%), PEG was implanted. The nutritional assessment at the start according to VGS was PEG (A: 25%, B: 25%, C: 50%); NoPEG (A: 28.6%; B: 51%; C: 20.4%);  $p < 0.01$ ). Those in which PEG was implanted had a higher rate of admissions (26.3% vs. 8.3%,  $p < 0.01$ ). In those who were implanted earlier, they had less income associated with complications of this (>10 m: 27.5%, <10 m: 0,  $p = 0.01$ ). Among the deceased patients 38 (40.4%) those who had PEG implanted (20 patients (52.6%) had a longer survival time (30.21 (5.15) months vs. 15.31 (3.47)) months,  $p = 0.01$ ).

**Conclusions:** Patients with PEG present a worse nutritional situation at onset. PEG implanted early produced a reduction in admission associated with complications derived from it. PEG could show a survival benefit among patients with ALS.

**Disclosure of Interest:** None declared.

### SUN-PO171 NUTRITIONAL STATUS AND RELATED COMPLICATIONS IN HOSPITALIZED ONCOLOGICAL PATIENT

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**Rationale:** Malnutrition is a disease with a high prevalence in the oncological patient. The aims of this study were: (a) To assess the nutritional status of the oncological hospitalized patient. (b) Evaluate the relationship of the nutritional situation of the patient with the development of complications.

**Methods:** An observational, longitudinal and retrospective study was designed in 168 patients admitted to the Oncology Department of a tertiary hospital in which nutritional support was requested between January 2014 and June 2017. They were collected epidemiological, anthropometric and nutritional data. The nutritional status was evaluated with the Mini Nutritional Assessment (MNA) and the Malnutrition Universal Screening Tool (MUST).

**Results:** Of the 168 patients, 29.9% were women and 70.1% men, with a median age of 63 (56–71) years. Most of the patients were in an advanced stage of the disease (Stage III: 15.3%, Stage IV: 66.7%). The median stay of the patients was 11.5 (7–19) days. The median weight loss before admission was 12.50 (6.67–18.29) %. The median consumption of the diets was 50 (30–75) %. The adjustment of the diet consumed to the requirements had a median of –34.98 (–7.80–59.38) %. Among the patients analyzed, artificial oral supplementation was prescribed in 138 (82.1%), enteral nutrition by tube in 18 (10.7%) and parenteral nutrition in 4 (2.4%). According to the MUST scale, 62.3% had a high nutritional risk and 12.3% would have a mild nutritional risk. According to their MNA score, 47.2% of Oncology patients had a poor nutritional status (MNA <17.5). The multivariate analysis by logistic regression showed that the poor nutritional situation (MNA <17.5) is related to an increase in the probability of death independently of the stage of the disease and the age of the patient OR: 3.74 IC95% (1.37–10.21) p-value = 0.01.

**Conclusions:** Malnutrition among oncological patients hospitalized in the HCUV is a frequent comorbidity and with a prevalence like previous studies. The poor nutritional status acts as an independent risk factor in the mortality of cancer patients.

**Disclosure of Interest:** None declared.

### SUN-PO172 ALLERGY STATUS OF HOSPITALIZED PATIENTS AND REDUCED ERRORS IN PROVIDING MEALS THROUGH THE DEVELOPMENT OF A COMPUTERIZED SYSTEM

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**Rationale:** Patients are likely to incur allergic food-related accidents because it is difficult to know about allergenic foods on their meal plate.

**Methods:** We collected patient's food allergy cases who admitted to Samsung Medical Center in December 2018, to grasp the allergy status. Before the automated system was developed, recipe for allergenic foods were identified by manually entering data and matching with existing text. With the developed system, the user can automatically match allergy foods and recipes using the allergy food database and

display them on the menu information sheet. We compared the error reports of food provision before and after development.

**Results:** Of the 8,501 patients admitted to the hospital in December 2018, 338 patients (4.0%) reported food allergies, of which 41 (12%) were children (≤18 years). In children, food allergies included milk (11%), crab (11%), peanuts (10%), eggs (10%), and shrimp (10%). In adults, the allergies were peach (16%), mackerel (11%), pork (10%), shrimp (10%), and crab (10%). Children had a significantly higher incidence of allergies to milk (p = 0.004), eggs (p = 0.002), peanuts (p = 0.014), and sesame (p = 0.017). The analysis of the error rate of the meals before and after the development of the system showed that there were 18 errors (3 operating errors, 7 input errors, and 8 preparing meal errors) in providing allergy meals during the period (2013–2014) before the development of the system. After its development (2017–2018), the number of errors in the provision of meals totaled 4 cases, all of which were errors in preparing meals, and the error rate was 78% lower than before.

**Conclusions:** It is necessary to plan and manage alternative menus for allergic foods of patients who are admitted to the hospital, in advance, and to reduce errors in providing meals, as well as provide safe meals, by building an automated system.

**Disclosure of Interest:** None declared.

### SUN-PO173 EFFECTS OF A WEIGHT-LOSS MEDITERRANEAN LIFESTYLE INTERVENTION ON SYMPTOMS AND QUALITY OF LIFE OF PATIENTS WITH OBSTRUCTIVE SLEEP APNEA: A RANDOMIZED CONTROLLED CLINICAL TRIAL

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**Rationale:** Obstructive sleep apnea (OSA) patients suffer from insomnia, sleepiness and low quality of life. Our aim was to explore the effect of a weight-loss Mediterranean lifestyle intervention (MLI) combined with continuous positive airway pressure (CPAP) on OSA symptoms and quality of life, compared to patient standard care (SC) (i.e. CPAP alone).

**Methods:** 117 adult overweight/obese patients (77% men, mean age: 47 ± 10 years) with polysomnography-diagnosed OSA were randomized to either a SC group (SCG, n = 59) or a MLI group (MLIG, n = 58). Patients in SCG received CPAP and general lifestyle advice, while those in MLIG participated in an intensive 6-month intervention, in addition to CPAP, aiming at 5–10% weight loss and promoting adherence to the Mediterranean lifestyle. Patients were evaluated pre- and post-intervention regarding OSA symptoms, quality of life, anthropometric indices and lifestyle habits.

**Results:** The two groups did not differ in anthropometric, lifestyle or clinical parameters at baseline. Drop-out rate was 24.1% for MLIG and 35.6% for SCG. Mean weight loss was –11.3 kg for MLIG and –0.5 kg for SCG (P < 0.001). Both groups had significant reductions in daytime sleepiness and degree of insomnia, however improvements were greater in MLIG after adjusting for baseline values, weight loss and adherence to CPAP (both P < 0.001). At 6 months, % of patients with excessive daytime sleepiness and insomnia was 2.3 and 11.4 in MLIG compared to 63.2 and 31.6 in SCG (P = 0.02 and 0.001, respectively). Physical and mental health improved only in MLIG (both P < 0.001), and the difference between groups was significant for mental health (P = 0.02).

**Conclusions:** A weight-loss MLI combined with CPAP offers additional improvements in OSA symptomatology and patients' quality of life, compared to CPAP alone.

**Disclosure of Interest:** None declared.

#### SUN-PO174

##### THE NUTRITIONAL ADEQUACY OF A GLUTEN-FREE DIET IN ADULTS WITH CELIAC DISEASE

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**Rationale:** Since gluten-containing whole grains contain fiber and nutrients, such as B vitamins, calcium and iron, it is important to compensate for these missing nutrients in gluten-free diet (GFD) in patients with celiac disease (CD). Our aim was to determine the nutritional adequacy of GFD.

**Methods:** The study population included 66 adults (average age: 41 years old) with CD diagnosed by the serological and histopathological tests. All participants completed a 3-day diet diary, additionally a qualified dietician carried out a 24-hour diet recall during the consultation. GFD adherence was also evaluated by validated tests: Celiac Dietary Adherence Test (CDAT) and Standardized Dietitian Evaluation (SDE). Assessment of nutritional status was carried out using anthropometric measurements and bioimpedance. Statistical evaluation of medical data were performed with STATISTICA program.

**Results:** Among CD patients, 15% were malnourished, 13% were overweight, and 2% were obese. Moreover, the majority of patients had altered body composition: 59% had excessive fat mass. Only 21% of patients had remission of CD, while 44% had partial remission and 35% still had symptoms of CD. In the group with remission, almost 80% consumed too much fat (especially cholesterol) and not enough calcium; more than 50% did not eat appropriate amount of iron and potassium. In contrary, in the group of active CD only 35% of patient's diets contained too much fat, but consumption of calcium and other nutrients was comparable.

**Conclusions:** Diet of patients with active CD contains less fat than diet of people with remission, however, in both groups nutritional deficiencies are still an important problem. This can lead to an abnormal nutritional status and CD complications. Therefore, balancing a GFD, in consultation with a dietician, plays a crucial role in the therapy of this disease.

**Disclosure of Interest:** None declared.

#### SUN-PO175

##### NUTRITIONAL STATUS IN OLD PATIENTS WITH WOUND HEALING DISORDERS AT HOSPITAL ADMISSION

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**Rationale:** Wound healing disorders (WHD) are common in old adults and are usually associated with negative clinical outcomes and higher mortality (1). In this prospective cross-sectional study, we evaluate the

number and type of WHD and the nutritional status in old patients at admission in an acute geriatric clinic.

**Methods:** We assessed all study participants for WHD (pressure ulcer, leg ulcers caused by venous insufficiency or peripheral artery occlusive disease, diabetic foot and chronic non-healing surgical wounds) at hospital admission. Involuntary loss of weight in the last 3 and 6 months was recorded. We used 4 categories of BMI according to WHO (<18.5 kg/m<sup>2</sup>, 18.5–24.9 kg/m<sup>2</sup>, 25–29.9 kg/m<sup>2</sup>, ≥30 kg/m<sup>2</sup>) and loss of appetite was estimated with the CNAQ questionnaire.

**Results:** Of 215 recruited old patients (78.2 ± 7.1 years, 60% female), 45 (20.9%) patients had WHD at admission, with a mean number of WHD/person of 2.4 ± 2.2 (min – max: 1–10). Pressure ulcer (n = 21) was the most common WHD followed by chronic non-healing surgical wound (n = 18), leg ulcers caused by peripheral artery occlusive (n = 5), leg ulcers caused by venous insufficiency (n = 3), diabetic foot (n = 1), and other WHD (n = 5). Although patients with WHD had lost more weight in the last 3 (6.2 ± 6.8% vs. 2.7 ± 4.4%, p = 0.002) and 6 months (8.6 ± 9.5% vs. 3.4 ± 4.8%, p = 0.001), WHD were most frequently present in obese patients (<18.5 kg/m<sup>2</sup>: 18.5–24.9 kg/m<sup>2</sup>: 25–29.9 kg/m<sup>2</sup>: ≥30 kg/m<sup>2</sup>: 6.7%; 33.3%; 20%; 40%, chi<sup>2</sup> p = 0.028). The ANOVA also showed a significant difference in number of WHD/person between BMI categories (global p = 0.031) with the highest number of WHD/person present in obese patients compared to overweight patients (0.9 ± 1.9 number of WHD/person vs. 0.3 ± 0.9 number of WHD/person, p = 0.040). Patients with WHD did not suffer more frequently from loss of appetite compared to other patients (48.9% vs. patients without WHD 56.4%, p = 0.367).

**Conclusions:** Our results showed that although involuntary weight loss is higher in patients with chronic wounds, an obese BMI is associated with the highest number of WHD/person. This might partly be explained by inflammatory processes, which are related to obesity.

#### Reference

1. Zarchi *et al.* 2015

**Disclosure of Interest:** None declared.

#### SUN-PO176

##### DO FAT-SOLUBLE VITAMIN REQUIREMENTS IN ADULT CYSTIC FIBROSIS PATIENTS CHANGE FOLLOWING BIPULMONARY TRANSPLANTATION?

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**Rationale:** Is well known that cystic fibrosis (CF) adult patients who have exocrine pancreatic insufficiency (EPI) require supplementation with fat-soluble vitamins (FSV). An increase in FSV levels after BPT has been described, even reaching in the long term potentially toxic levels. There are no clear recommendations on the dose of vitamins needed by patients after BPT.

**Aim:** to evaluate the FSV blood changes in CF patients and EPI, previous and after to BPT.

**Methods:** Observational study in CF patients with EPI undergoing/ following a BPT. We compared FSV serum levels (A, D, E and prothrombin time) before BPT and 3 month later, analyzing separately the patients who continued taking the usual vitamin supplementation and those who withdraw it after the transplantation. All patients prior to BPT were supplemented with specific FSV. In case of a punctual deficiency, it was necessary an extra FSV supplementation. Other parameters studied: gender, Diabetes mellitus related to CF, BMI and



FSV supplementation. All patients received immunosuppressive treatment after BPT.

**Results:** 22 CF adult patients following/undergoing to TBP (12 women), age 29.5 ( $\pm 7$ ). All presented EPI, additionally 10 presented endocrine pancreatic insufficiency (45%). The FSV compliance was adequate. Three months after BPT half of them keep a good FSV compliance (table 1). After BPT, patients who didn't follow FSV supplementation, showed adequate FSV blood levels, in some cases above the maximum levels recommended.

Parameters	Previous – transplantation	After – transplantation (3 months)	p
Weight	46.7( $\pm 10.85$ )	47.5( $\pm 9.76$ )	n.s
BMI	17.9( $\pm 2.8$ )	18.2( $\pm 2.54$ )	n.s
AVit (1.55–2.5 mmol/l)	1.22( $\pm 0.32$ )	2.2( $\pm 0.68$ )	p < 0.0001
E Vit (18–46 mmol/l)	20.4( $\pm 6.4$ )	26.8( $\pm 8.3$ )	p = 0.006
D Vit (>20 mmol/l)	23.8( $\pm 11.5$ )	27.1( $\pm 11.9$ )	n.s
Protrombine time (%)	83.1( $\pm 12.7$ )	96.0( $\pm 14$ )	p = 0.003

**Conclusions:** FSV blood levels increase after BPT in CF adult patients. The FSV doses after BPT should be re-evaluated, especially vitamin A levels, because of their potential long-term toxicity.

**Disclosure of Interest:** None declared.

#### SUN-PO177

#### CAN MUSCLE MASS BE PRESERVED DURING ADMISSION? BEYOND NUTRITION DAY

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**Rationale:** The pulmonary patient has a high nutritional risk. During admission, respiratory infections and immobility, among other causes, favours malnutrition and loss of muscle mass, being associated with worse prognosis.

The aim of the study was to assess muscle mass (MM) evolution and function (FM) in patients with respiratory pathology admitted in our hospital.

**Methods:** Descriptive prospective study in hospitalized patients included in NutritionDay 2018 at the Pneumology Service. Body composition measurement: Tetrapolar Bodystat QuadScan 4000 Bioelectrical Impedance (BIA). FM measurement: hand hydraulic dynamometer (HG-JAMAR). Other Variables: hospital diet compliance, length of stay (LOS). All data were collected weekly during 3 weeks. Diet was adapted and supplemented individually according to nutritional needs.

**Results:** 23 patients (age 62.4  $\pm$  13.5), 13 women, LOS: 21.8  $\pm$  15.8. With the individualized nutritional treatment and dietary enrichment we observed an improvement in the adherence of the assigned energy and protein intake (Table 1); in the third week 75% of the patients fulfilled 100% of the intake. After the nutritional intervention, FM and MM were preserved (table 1). Fat free mass index (FFMI) correlates slightly with FM (R = 0.498, p = 0.015). The MM correlates with the FM (R = 0.656, p = 0.001).

Variables	1st Week (n:23)	2n Week (n:12)	3th Week (n:4)
FFMI	17.2 $\pm$ 3.5	17.7 $\pm$ 2.8	20.3 $\pm$ 2
MM (kg)	46.3 $\pm$ 13.7	49.2 $\pm$ 11.5	54.2 $\pm$ 5.8
FM(kg)	21.39 $\pm$ 7.2	22.23 $\pm$ 9.5	24.8 $\pm$ 8.5*
Diet compliance over 100%	52.2%	66.6%	75%

\*P < 0.05 between the 1st and 3th week

**Conclusions:** With an adapted dietary treatment and a regular monitoring, we can preserve the FM and the MM in the patient admitted to the Pneumology Service. The significant correlation observed between MM measured by BIA and FM measured by HG, show that HG could be an alternative to BIA in clinical practice due to its simplicity, reproducibility and lower cost.

**Disclosure of Interest:** None declared.

## Nutritional assessment I

#### SUN-PO178

#### NUTRITIONAL STATUS IN CHILDREN WITH INFLAMMATORY BOWEL DISEASE

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**Rationale:** Children with inflammatory bowel disease (IBD) often have nutritional status disorders associated with both reduced meal intake, increased loss of nutrients with stool, chronic catabolic status, increased nutritional requirement and therapy.

**Methods:** We assessed anthropometry and body composition in 60 children (22 girls and 38 boys) aged 4–17 years with IBD. 25 (42%) subj. have ulcerative colitis (UC), 17 (28%) have Crohn's disease (CD) and 18 (30%) subj. have IBD unclassified. The WHO AnthroPlus program and bioelectrical impedance analysis (BIA) were used to assess the parameters of the nutritional status.

**Results:** According to the anthropometry 36 (60%) subj. have malnutrition (UC – 23 (92%), CD – 13 (77%), p < 0,05). 9 (25%) of them have mild (UC – 2 (8%), CD – 7 (41%)), 20 (56%) subj. have moderate (UC – 12 (48%), CD – 8 (47%)) and 7 (19%) subj. have severe malnutrition (UC – 5 (20%), CD – 2 (12%)). 4 (7%) children were overweight (UC – 3 (12%), CD – 1 (6%)). According to the results of BIA 50 (89%) subj. have body composition disorders (UC – 24 (96%), CD – 15 (88%)). The active cell mass was decreased in 31 (52%) subj. with malnutrition (UC – 18 (72%), CD – 13 (77%)). An increase of the fat mass proportion was found in 30 (14%) children with malnutrition (UC – 18 (72%), CD – 12 (71%)). Decreased phase angle values which may indicate a low level of functional capabilities and disease exacerbation were observed in 18 (72%) children with UC and 10 (59%) patients with CD (p < 0,05).

**Conclusions:** According to our preliminary data nutritional status disorders were detected in a majority of children with IBD. Patients with UC have malnutrition and altered body composition more often than in CD. This may be due to the high frequency of total and severe form of the UC among our patients. Our results require a more detailed study of the nutritional status of children with IBD for targeted correction of nutrition.

**Disclosure of Interest:** None declared.

### SUN-PO179 VALIDITY OF THE NUTRITION SCREENING TOOL CIPA IN SURGICAL INPATIENTS AND DIFFERENCES IN CLINICAL OUTCOMES ACCORDING TO THE RESULT

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**Rationale:** The nutritional screening CIPA (Control of Intakes, Proteins, Anthropometry) is positive if one of the following is met: 48–72 h food intake control <50%, serum albumin <3 g/dL, body mass index (BMI) <18.5 kg/m<sup>2</sup> or mid-upper arm circumference ≤22.5 cm. After validity in hospitalized non-surgical inpatients<sup>\*\*\*</sup>, the CIPA method is valid when compared with Subjective Global Assessment (SGA) in surgical pathologies.

**Methods:** Prospective study of prevalence of malnutrition on 226 adults patients admitted to surgical departments, through CIPA and SGA screening. The data of SGA, CIPA, epidemiological and clinical outcomes were collected. Concordance between the two methods (Kappa index), sensitivity (S) and specificity (E) of CIPA were studied. Analysis of hospital malnutrition according to CIPA screening and association of positive results with length of stay (LOS), mortality and rate of early readmission. Checking normal distribution by Kolmogorov-Smirnov test, bivariate analysis with Student's or Mann-Whitney U test and categorical variables Chi-square test. Quantitative variables are expressed as mean±standard deviation or as median and interquartile range (IQR), and qualitative as frequencies (%). Level of significance: 5%.

**Results:** The prevalence or risk of malnutrition by CIPA was 35.40% (95%CI: 29.12–41.68) and 30.08% (95%CI: 24.06–36.11) by SGA. S and E of CIPA taking SGA as a reference: 70.59% and 79.75% respectively. K-index evaluating concordance between CIPA and SGA was 0.479 (p < 0.001). CIPA is able to detect patients with higher risk of hospital death (5.00% vs 0%, p = 0.006) which contrasted with SGA (2.94% vs 1.27%, p = 0.385). CIPA detected mortality in the first three months after discharge, 8.75% vs 0.68%, p = 0.002, also SGA 8.82% vs 1.27%, p = 0.005. Patients with CIPA screening positive had an increased median LOS compared with negative, (21; 14–34 days vs 14.5; 9–27 days, p = 0.002) and SGA too (23; 14.25–37.25 vs 15; 9–25, p < 0.001). CIPA screening is also able to detect higher rate of early readmissions vs CIPA negative (25.32% vs 8.22%, p < 0.001 as well as SGA (23.53% vs 10.13%, p = 0.008).

**Conclusions:** The prevalence of malnutrition in surgical patients is high. The nutritional screening CIPA is able to detect the surgical patient with worse clinical outcomes, being a simple and applicable tool in the hospital. CIPA proved valid for use in surgical patients.

#### References

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**Disclosure of Interest:** None declared.

### SUN-PO180 DIFFERENCES IN LOW MUSCLE MASS CRITERIA IN GLIM DIAGNOSIS OF MALNUTRITION DEPENDING OF DIFFERENT FORMULAE

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**Rationale:** Recently, a new nutritional assessment tool has been proposed: GLIM criteria for the diagnosis of malnutrition. It includes three phenotypic criteria (non-volitional weight loss, low body mass index, and reduced muscle mass) and two etiologic criteria (reduced food intake or assimilation, and inflammation or disease burden). Reduced muscle mass can be defined for men and women according to ASMI <7.26 and <5.25 or according to FFMI <17 and <15 respectively. The objective of the present study is to compare the results of applying both formulas in a defined population

**Methods:** A cross-sectional study was performed in 132 patients hospitalized with basal diet (20.18% from the total hospitalized patients) (57.6% men, mean age 66.9 +15, range 19–97 years). We determine BIA and calculate the low muscle mass according to ASMMI and FFMI for malnutrition (GLIM). The prevalence of malnutrition is compared with the two formulas. Informed consent was obtained.

**Results:** 1) The first step is a screening test. We used MNA-SF with 64.4% normal, 33.3% risk and 2.3% malnourished. 2) Regarding weight loss: 82.6% lose only <5%, 13.6% lose 5–10% (moderate) and 3.8% lose > 10% (severe). 3) Normal BMI in 90.2%, moderate affectation 7.6% and severe 2.3%. 4) FFMI low at 23.5% and ASMI low at 33.3%. 5) Reduced food intake only 3%. 6) The etiological criterion of inflammation was applied to all patients due to presenting an acute situation that motivated their hospital admission. 7) GLIM: moderate malnutrition 26.5% and severe 6.1%. 8) Only 58.3% of patients agree that ASMI and FFMI are normal and 15.2% agree that both are low. The 18.2% ASMI is low but FFMI is normal and 8.3% is the opposite. These differences did not alter the GLIM results for the other phenotypic and etiologic criteria.

**Conclusions:** In hospitalized patients reduced muscle mass is the phenotypic criterion more frequently affected and it depends of the formula used.

**Disclosure of Interest:** None declared.

### SUN-PO181 COMPARISON OF TWO FORMULAS FOR MUSCLE MASS CALCULATION ACCORDING TO THE EUROPEAN CONSENSUS OF SARCOPENIA AND MALNUTRITION IN INSTITUTIONALIZED ELDERLY POPULATION

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**Rationale:** Recently, consensus has been published for the diagnosis of sarcopenia (EWGSOP2) and malnutrition (GLIM). In both the muscle mass has a fundamental role that can be measured with BIA (bioelectrical impedance analysis). To standardize the results, they recommend formulas based on the electrical data of Resistance and Reactance. But each consensus recommends different formulas with their cut-off points. We propose to compare the results of muscle mass with both formulas in a group of institutionalized elderly.

**Methods:** A cross-sectional multicenter study was carried out in 187 institutionalized elderly people (64.7% women, average age 83.27 + 7.2

(63–96) years). We determined BIA and calculated ASMMI for the diagnosis of sarcopenia (EWGSOP2) and FFMI for malnutrition (GLIM). Linear regression analysis was performed between ASMMI and FFMI. The elderly were determined with muscle mass (MM) decreased according to the cut points of each parameter and Chi square was used to determine the concordance of both tests. The study was evaluated by the local ethics committee.

**Results:** There is a high relationship between the two determinations ( $R^2 = 0.993$ ,  $ASMMI = 1.91 + 2.33 \times FFMI$ ).

From the 187 elderly, in 129 (68.9%) the muscle mass was normal and in 34 (18.8%) decreased with both. But in 24 (12.8%) ASMMI of the EWGSOP2 was decreased with FFMI of the normal GLIM and none of those that had the FFMI of the GLIM low had the ASMMI of the EWGSOP2 was normal.

**Conclusions:** The assessment of the muscle mass of the institutionalized elderly studied according to the use of formulas for the diagnosis of sarcopenia or malnutrition may vary, being the criterion of the EWGSOP2 more sensitive than that of GLIM.

**Disclosure of Interest:** None declared.

#### SUN-PO182

##### THE VALUE OF BIOIMPEDANCE IN THE ASSESSMENT OF THE SEVERITY OF CACHEXIA IN PATIENTS WITH COLORECTAL CANCER

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**Rationale:** Malnutrition in oncological patients results from cachexia and anorexia. Bioelectrical impedance analysis (BIA) establishes the composition of the body, which seems to be an effective tool to assess the stage of cachexia.

**Methods:** The study group consisted of 107 patients (M = 46; F = 61, mean age  $66 \pm 12$ ) including patients with colorectal cancer (56) and healthy individuals (51). BIA was carried out using the seca mBCA 525 device (seca GmbH & Co. KG.). Nutritional status was assessed using: NRS 2002, SGA, BMI, total protein, albumin and others. Statistical data were analyzed by the Student's T test using Statistica 13 software. Statistical significance was defined using a two-sided value of  $P < 0.05$ . Receiver-operator characteristic (ROC) curve analysis was used to compare the ability of BMI, skeletal muscle mass (SMM), fat mass index (FMI), and other to identify the presence of cancer cachexia.

**Results:** There were significant differences ( $p < 0.05$ ) in the division of patients into the group with cancer and control, in terms of: SMM, extracellular water/total body water (ECW/TBW) and phase angle (PA). Applying the sex division, the differences ( $p < 0.05$ ) between cancer patients and control patients included; in women SMM, TBW, ECW/TBW, and in men fat free mass (FFM), SMM, TBW, ECW/TBW.

Overweight was found among patients with cancer and also in the control group, according to BIA (63%) and by Lorenz's (92%).

**Conclusions:** Screening methods for assessing nutritional status do not take into account changes in body composition. BIA provides valuable information on the composition of the body, which can be an important complement to these methods in the context of the Fearon's definition of cachexia. Evaluation of BIA results requires their reference to the results of the same-sex control group.

**Disclosure of Interest:** None declared.

#### SUN-PO183

##### CORRELATION BETWEEN LEFT VENTRICULAR MASS AND FAT FREE MASS INDEX IN PATIENTS WITH SYSTEMIC SCLEROSIS WITHOUT CARDIOVASCULAR DISEASE

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**Rationale:** Systemic sclerosis (SSc) may be associated with malnutrition. We previously found that left ventricular mass (LVM) reflects poor nutritional status in SSc patients; no data are available on LVM as surrogate of muscularity in SSc. We aimed to evaluate the association between muscle mass indices in SSc patients and LVM, as a novel indicator of muscularity in this setting.

**Methods:** Patients and gender- and body mass index (BMI)-matched healthy controls (HCs) underwent echocardiography to assess left ventricular mass (LVM) and LVM normalized by body surface area (LVMI). Body composition, including fat free mass index (FFMI), phase angle (PhA) and body cell mass index (BMCI), was assessed by bioelectrical impedance analysis (BIA). We recorded Disease Activity Index (DAI), Disease Severity Scale (DSS), Modified Rodnan skin score (mRSS).

**Results:** 64 SSc patients (55 women; mean age  $50 \pm 13$  y) and 30 HCs were enrolled. Mean DAI, DSS and mRSS were  $3.9 \pm 3$ ,  $5 \pm 4$  and  $12 \pm 7$  respectively. BMI ( $\text{kg}/\text{m}^2$ ) in patients was not different from HCs ( $22 \pm 3.1$  vs  $22.3 \pm 3.6$ ). BMCI and PhA were significantly lower in SSc patients with respect to HCs [ $10.38 \pm 1.24$  vs  $18 \pm 1.4$  and  $4.6 \pm 0.8$  vs  $5.6 \pm 0.4$ , respectively] ( $p < 0.001$ ). Absolute and normalized LVM in SSc patients and HCs were respectively  $110.8 \pm 36.7$  g vs  $108 \pm 19$  g ( $p = 0.068$ ) and  $66.8 \pm 19.8$   $\text{g}/\text{m}^2$  vs  $65.8 \pm 8$   $\text{g}/\text{m}^2$  ( $p = 0.140$ ). In multiple regression analysis we found a positive correlation between LVMI and FFMI ( $r = 0.52$ ,  $p < 0.01$ ). No correlation was found between LVMI and FFMI in the HCs, as well as between LVMI and other BIA parameters and severity and activity indices.

**Conclusions:** A correlation between LVMI and indices of muscularity exists in patients with SSc. If further confirmed, the cardiac mass might be use as a surrogate of nutritional status.

**Disclosure of Interest:** None declared.

#### SUN-PO184

##### ANALYSIS OF MUSCLE QUALITY BY ELECTRICAL IMPEDANCE MYOGRAPHY AND THEIR RELATIONSHIP WITH QUALITY OF LIFE AND THE HEALTHY EATING INDEX

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**Rationale:** Whether electrical impedance myography or Bioelectrical impedance analysis is a stronger predictor of sarcopenic-obesity considering muscle strength and quality of life.

**Methods:** Body composition was obtained by Electrical Impedance Myography (EIM) and Bioelectrical impedance analysis (BIA), information was used to determinate body composition percentages. Muscle strength was determined by dynamometry. Quality of life was obtained by EuroQol-5D. Fitness Test Battery y Eurofit Testing Battery was determinate. Information of the dietary intake was obtained by 24-hour recall. The Healthy Eating Index (HEI) was used to score the diet component. Statistical analysis included a paired t test, to determinate the differences between the intake amount and the



suggested; and linear regression analysis to determinate the effect of Muscle Quality on quality of life (QoL).

**Results:** Forty-six adults (33% males and 67% females) were evaluated. According to the BMI 54.3% (25/46) of the patients were overweight, obesity grade I was 15.2% (7/46), obesity grade II was 2.1% (1/46), Obesity grade III was 2.1% (1/46). According to the waist circumference 80% (n = 36) of the patients had an increased cardiovascular risk. Subjects were classified as sarcopenic 6.5% and sarcopenic-obese 17.3% with EIM, with BIA was 3.4% lower, Muscle Quality was 'good' in 36%. The amount of EQ-5D as 0.82 (SD = 0.15). The MQ was entered into the linear regression model as a continuous variable, the QoL were significant (p = 0.031). The mean amount of energy, fat, protein, and carbohydrates were 2200.1 kcal/d (SD = 500), 65 gr/d (SD = 25), 71 gr/d (SD = 13) and 233 gr/d (SD = 60), respectively.

Distribution by categories and levels of the EuroQoL.

Category	Level 1	Level 2	Level 3
Mobility	72%	28%	0%
Personal care	91%	89%	0%
Everyday activity	82%	17%	0%
Pain/Upset	54%	42%	4.34%
Anxiety/Depression	65%	35%	0%

**Conclusions:** Electrical impedance myography has a potent facility to measure the fat- mass and muscle quality. The incidence of sarcopenic obesity using EIM and BIA was different between the two methodologies. The risk of sarcopenia should be considered in those with low protein intake. Further research must be done in order to link the muscle quality and functionality to quality of life.

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**Disclosure of Interest:** None declared.

#### SUN-PO185

##### PREVALENCE OF OBESITY AND OVERWEIGHT IN CHILDREN OF PRIMARY SCHOOL

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**Rationale:** About 32% of portuguese children are overweighted (1). This study aims to evaluate the prevalence of overweight and obesity in five grade children of primary education.

**Methods:** A cross-sectional study conducted in five grade students of primary school, held in October 2016. Weight and Body Mass Index (BMI) were measured using Omron BF511<sup>®</sup> scale and height with a stadiometer. Data collected was classified according to the growth curves of the World Health Organization (2) and then analysed with Excel<sup>®</sup>.

**Results:** 140 children were evaluated, of whom 51.4% were female (n = 72); with a mean of 10.6 years±0.85. Prevalence of overweight (P85 ≤ BMI < P95) and obesity (BMI ≥ P95) were 15% (n = 21) and 23.6% (n = 33), respectively. Overweight prevalence was higher among males

(16%; n = 11), whereas obesity prevalence was higher in females (26.4%; n = 19).

**Conclusions:** The present study showed a high prevalence of overweight and obesity (38,6%). According to this reality it is essential to carry out more interventions in order to promote healthy eating habits among the school community and to prevent future comorbidities.

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**Disclosure of Interest:** None declared.

#### SUN-PO186

##### NUTRITIONAL ASSESSMENT OF PATIENTS WITH MUCOPOLYSACCHARIDOSIS – A CROSS-SECTIONAL PORTUGUESE STUDY

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**Rationale:** Mucopolysaccharidosis (MPS) patients may be at risk of malnutrition due to disease progression, and/or inadequate food habits. This study aimed to assess nutritional status of MPS patients.

**Methods:** A cross-sectional study including patients from 4 national centres was developed. Anthropometric, body composition, laboratorial data and usual food intake data were collected.

**Results:** 31 patients (5 MPS I; 4 MPS II; 9 MPS III; 3 MPS IV; 9 MPS VI; 1 MPS VII; 17 males), aged between 1.7 and 32.7 years, were included. The lowest weight, height and BMI z-score values were observed in MPS VI, MPS IV and MPS I groups, respectively. Mean phase angle varied from 3.9° to 5.0°, in MPS I and MPS VI groups, respectively. Pre-albumin, retinol binding protein (RBP), creatinine and HDL-cholesterol were low in 59.3%, 75%, 77.4% and 48.4%, of the patients, respectively. Vitamin D insufficiency was present in 38.7% and deficiency in 48.4%. MPS III group showed significantly higher plasma pre-albumin RBP and vitamin A levels and MPS VI group exhibited lower RBP, vitamin A and vitamin E than the other groups. Energy, protein, carbohydrate and fiber intake were lower than requirements in 56.0%, 32.0%, 64.0% and 76.0% of the subjects, respectively. The intake of vitamins and minerals was high in most patients.

**Conclusions:** MPS patients usually show high inability associated with elevated disease severity. In this sample, a substantial number of patients (namely MPS VI and the oldest ones), nutritional status was also found to be impaired. The degenerative character of MPS, as well as an unhealthy pattern of living may lead to nutritional deficits. Nutritional status monitoring and improvement, by correction of deficits, may contribute to a better prognosis and, possibly, to a better quality of health during the reminiscent years of life.

**Disclosure of Interest:** None declared.

### SUN-PO187 RELATIONSHIP BETWEEN BIA- AND CT-DERIVED MUSCLE MASS IN MEDICAL ILL PATIENTS

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**Rationale:** Low muscle mass predicts morbidity and mortality in hospitalization patients either in surgical and medical ill patients. Recently, previous study showed that muscle area derived from CT-scans and muscle mass from Bio-impedance analysis (BIA) are related to mortality. Both methods have their limitations. The aim of this study was to determine the correlation between CT- and BIA- derived muscle mass.

**Methods:** This cross-sectional study included adult medical ill patients who underwent abdominal CT scans in purpose for diagnostic. BIA was performed in the same day when CT-scan was performed. CT-scans was analyzed using special software. BIA was performed using standing-posture 4-electrode BIA device BC-418 (BIA, Tanita Corp, Tokyo, Japan). Height adjusted Appendicular skeletal muscle mass (ASM) was calculated from BIA. Height adjusted skeletal muscle Index (SMI) was performed from a single cross-sectional CT image (slice) at third lumbar (L3) for abdominal skeletal muscle area. We calculated Pearson's r correlation coefficient between two parameters.

**Results:** A total of 39 patients were included (28 female), mean age was 46.54 ± 14.87 years old. Mean height adjusted BIA-derived ASM was 6.17 ± 0.77 kg/m<sup>2</sup> in female and 7.81 ± 1.29 kg/m<sup>2</sup> in male. Mean height adjusted Skeletal muscle area was 257.84 ± 59.67 cm<sup>2</sup>/m<sup>2</sup> in female and 387.39 ± 114.48 cm<sup>2</sup>/m<sup>2</sup> in male. BIA derived muscle mass and CT-derived muscle were moderately correlated (r = 0.630, p < 0.001).

**Conclusions:** This study showed that BIA- and CT – derived muscle mass was moderately correlated. Further research is needed to confirm this result. However, our findings indicate BIA is a promising method to assess muscle mass without practical and safety issues of CT-scan using.

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**Disclosure of Interest:** None declared.

### SUN-PO188 LOW MUSCLE MASS CUTOFF FOR INDONESIAN POPULATION BASED ON ASIAN WORKING GROUP OF SARCOPENIA

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**Rationale:** Bioelectrical impedance analysis (BIA) is a simple and practical method for the assessment of body composition. BIA has important applications in the evaluation of nutritional status. From the Asian Working Group on Sarcopenia (AWGS) consensus recommended that reference value of cutoff low muscle mass based on a young reference group in each population. Until now, there is no reference cutoff of muscle mass for Indonesia population. The aim of this study is to identify cutoff of low muscle mass in healthy Indonesian population.

**Methods:** Healthy young adult between 18 and 25 years old with no known chronic disease or chronic drug use were included in our study as reference population for assessing low muscle mass. Muscle mass was assessed using standing-posture 4-electrode BIA device BC-418 (BIA, Tanita Corp, Tokyo, Japan). Mean of height adjusted Appendicular skeletal muscle mass (ASM) was calculated. Young reference of sex-specific cutoff was determined by lowest quintile of study population (Mean- 2SD). When conducting measurements, the subjects stood on the base with both feet contact with electrode plates and low voltage current passed through the body. The subjects were instructed not exercised in previous 30 minutes, not drinking caffeine-contained drinks, and keep hydrated.

**Results:** The young reference included a total of 232 participant consist of 145 females and 87 males. The mean age was 19.55 ± 1.28 years old. The mean of height adjusted ASM was 6.17 ± 0.66 kg/m(2) in female and 8.79±1.06 kg/m(2) in male. Cutoff thresholds of height adjusted ASM based on mean – 2SD were 5.52 kg/m(2) in female and 7.71 kg/m(2) in male.

**Conclusions:** The mean of cutoff of low muscle mass in Indonesian population were 5.52 kg/m(2) in female and 7.71 kg/m(2) in male. Further study with bigger sample size need to confirm this result.

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**Disclosure of Interest:** None declared.

### SUN-PO189 ASSOCIATION BETWEEN BODY MASS INDEX (BMI) AND NUTRITIONAL STATUS IN PATIENTS WITH PANCREATIC TUMORS UNDERGOING FOR SURGICAL TREATMENT

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**Rationale:** Surgical resection offers the only chance of cure for pancreatic cancer, but only 15 to 20 percent of cases can be treated surgically. Malnutrition and lack of implementation of nutritional therapy increases the risk of postoperative complications and

mortality. There are several methods of assessing nutritional status, but not all of them have the same sensitivity. We assessed whether BMI could be an indicator of nutritional status in this group.

**Methods:** The prospective analysis included 82 patients with pancreatic tumors qualified for surgical treatment. An assessment of the nutritional status was made based on NRS 2002, SGA. The albumin level was evaluated. We calculated BMI at the time of the study and before the disease. Body fat tissue (FAT%) was assessed by electrical bioimpedance (BIA).

**Results:** Malnutrition was detected in 84.1% (n = 68) by NRS and 79.3% (n = 64) by SGA. The average albumin value was 3.9 g/l. Hypoalbuminemia <3.5 g/l occurred in 22.2%. The average BMI value at the time of the study was 25.4 kg/m<sup>2</sup> (range 15.4–36.7). FAT% level was 38.5% in women and 26.1% in men. There was a significant correlation between the level of malnutrition and albumin (p = 0.00), also between BMI and albumin (p = 0.03). We evaluated associations between BMI before the disease and degree of malnutrition at the time of the study (p = 0.048).

**Conclusions:** Based on BMI, most of patients were overweight. However, most of them presented malnutrition or high risk of malnutrition. Despite significant weight loss, FAT% indicates excessive fatness, which may contribute to increase perioperative complications. More than 20% of the patients had hypoalbuminemia. Higher BMI before the disease affected the worse state of nutrition and increased weight loss.

**Disclosure of Interest:** None declared.

#### SUN-PO190

##### UTILITY OF SEGMENTAL BIOIMPEDANCE (INBODY S10) IN THE EVALUATION OF VASCULAR ACCESS

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**Rationale:** Bioimpedance is a simple, rapid and non-invasive technique to evaluate the body composition of patients with CKD. It's based on the conductive response of the human body to an electrical current, taking advantage of the different electrical properties of different tissues.

The segmental bioimpedance allows interpreting the human body as 5 cylinders, being able to study the hydration status of each member separately.

**Aim:** evaluate changes in the body composition of the arms according to vascular access in HD patients.

**Methods:** 111 patients with CKD IN HD from the university hospital of La Princesa in Madrid, were evaluated, and distributed according to presented fistula or catheter. The measurement was made using the S10 inbody segmental multifrequency bioimpedance, analyzing the data using the SPSS software 23.

**Results:** In the study sample, 36 patients presented catheter and 75 fistula, 64 in left arm and 11 in right arm. The TBW in patients with fistula was 34.19 ± 6.53, with catheter was 32.86 ± 6.28 L.

The TBW of arm right was 1.96 ± 0.42 L, and TBW of left arm was 2.16 ± 0.49L (p = 0,000).

We found significant differences between TBW of right and left arm (p = 0.000), as well as between TBW of left arm of patients with catheter (p = 0.000) but not in TBW of right arm of patients with catheter (p = 0.280)

**Conclusions:** segmental bioimpedance allows not only to evaluate the body composition, but also to evaluate the differences between the different body segments.

It allows to monitor the variations and evolution of the fistula as vascular access in the segment of the fistula.

**Disclosure of Interest:** None declared.

#### SUN-PO191

##### NUTRITIONAL RISK AT HOSPITAL: WHAT ARE THE DIFFERENCES BETWEEN THOSE WHO ENTER AT RISK AND THOSE WHO DEVELOP IT DURING HOSPITALIZATION?

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**Rationale:** In Spain the prevalence of hospital malnutrition is high. Because of the impact of disease related malnutrition in hospitals on the morbidity and mortality, it is important to identify patients at risk at admission. The objective was to study the differences between patients who are at nutritional risk at admission and those who develop it during hospitalization.

**Methods:** Patients admitted in Cardiology, Neurology and Digestive wards (01/25/17 to 03/03/17) with an expected stay of >48 h were included in the study. Nutritional screening (NRS-2002) was performed at admission and was repeated at least once during the hospitalization. Patients were grouped into 3 groups: risk at admission (RA), no risk during hospitalization (NR) and risk developed during hospitalization (RD). The results are expressed in percentages and mean ± SD. Chi-Square and ANOVA test of IBM-SPSS Statistics 21<sup>®</sup> were used.

**Results:** We included 105 patients, 52.4% men, aged 65.6 ± 18.6, of whom 67.6% were at risk at admission, 23.8%NR and 8.6%RD. No significant differences were found between groups in mortality, infectious complications rate and readmissions after 30 and 60 days. The following table summarises the statistically significant results (p-value < 0,05):

**Conclusions:** Patients who become malnourished during hospitalization are those who have a longer length of stay. These data agree with those obtained in the Spanish PREDYCES study. Therefore, we recommend to re-evaluate the nutritional risk during the hospital stay in order to adequately treat malnutrition.

	RA	RD	NR
Age (years)	73.6 ± 15.3	65.6 ± 12	43.4 ± 23.1
Length of Stay (days)	10.9 ± 7.7	25.9 ± 14.6	9.8 ± 4.2
BMI at admission (kg/m <sup>2</sup> )	24.1 ± 4.8	29.1 ± 4.9	25.8 ± 5
Weight loss (%)	12.7 ± 7.6	5.3 ± 4.2	3.3 ± 1.2
Charlson Index at admission	3.2 ± 2.7	3.4 ± 2	1 ± 2

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### SUN-PO192 CHANGES IN RESTING ENERGY METABOLISM IN PATIENTS ON TOTAL PARENTERAL NUTRITION VERSUS ENERGY SUPPLY

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**Rationale:** Knowledge of the real demand for energy is the basis for planning the proportion of nutrients adapted to the current needs and is an extremely important element in the assessment of nutritional status. The most accurate method of estimating the resting metabolic rate is indirect calorimetry (IC), however, due to the costs of equipment in general-clinical practice, the prediction equations are most often used. People qualified for total parenteral nutrition (TPN) are a group of patients in severe general condition, in whom the estimates may not coincide with the actual demand of energy.

**Methods:** Measurements of resting energy expenditure (REE) using IC were performed in 31 patients [average (Av) age: 51.06 ± 16.40 years Min: 18 y.o. Max: 79 y.o., males (M) – 67.74%, females (F) 32.26%] qualified for nutritional treatment on first day of starting TPN and on the 7th day of its application. The results of REE were compared to the energy value of commercial food bags. The T-test and the Wilcoxon signed rank test were used for statistical analysis.

**Results:** The average value of REE was for M: 1605,29 ± 457,46 kcal and for F: 1178,30 ± 317,62 kcal  $p = 0.01284$ , and after 7 days M: 1490,29 ± 406,11 kcal, F: 1289,10 ± 227,85 kcal  $p > 0.05$ . Energy supply with TPN was significantly different in the first day in the group of men – the difference of 268.67 ± 467.85 kcal (1336,62 ± 114,31 kcal) in the group of women and after a week of using TPN there were no statistically significant differences.

**Conclusions:** The application of IC in patients qualified for TPN as a determinant of resting energy demand is justified due to the very different clinical condition and large dispersion of compliance with the predictive equations. During the seven-day TPN, no significant changes in the resting metabolic rate of patients undergoing nutritional treatment were observed.

**Disclosure of Interest:** None declared.

### SUN-PO193 RATE AND CORRELATES OF A POSITIVE SCREEN FOR EATING DISORDERS: A CROSS-SECTIONAL STUDY AMONG CHILDREN AND YOUNG ADOLESCENTS IN LEBANESE SCHOOLS

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**Rationale:** Eating disorders (ED) are one of the most common psychiatric illnesses that may lead to physical and psychosocial morbidity in children and young adolescents. The aim of this study was to assess the prevalence and correlates of a positive screen for ED among children and young adolescents in several Lebanese schools.

**Methods:** This cross-sectional study included a convenience sample of 253 students (54.5% males and 45.5% females), aged between 8 and 13 years, recruited from private schools located in Mount Lebanon between February and June 2018. Every student was interviewed to collect information about sociodemographic factors and health characteristics. SCOFF questionnaire was used to examine the prevalence of positive screens for ED. Logistic regression analyses

were conducted with the use of the screening of ED as the dependent variable.

**Results:** SCOFF was positive in almost one third (36.4%) of the students. Logistic regression analyses showed that being between 8 and 9 years ( $p = 0.029$ ), obesity ( $p = 0.01$ ), and the symptom of fatigue ( $p = 0.017$ ) were associated with a positive screen for ED.

**Conclusions:** The high prevalence of positive screens for ED among children and young adolescents points out the urgent need for earlier diagnosis and intervention.

**Disclosure of Interest:** None declared.

### SUN-PO194 ARE THE USERS OF WEIGHT LOSS SUPPLEMENTS AT HIGHER RISK OF HAVING A POSITIVE SCREEN FOR EATING DISORDERS?

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**Rationale:** Weight loss supplements may be used as means for compensating binge eating by providing a liberating effect from diet control. Thus, eating disorders (ED) may be associated with the harmful use of weight loss supplements. The objective of this study was to explore the association between the use of weight loss supplements and a positive screen for ED.

**Methods:** This observational cross-sectional study was carried out between March and July 2018. A convenience sample of 200 adults, recruited from the clients of a pharmacy in Mount Lebanon, was equally divided into a group of users of weight loss supplements and a control group of non-users. Data on socio-demographic, lifestyle and health characteristics were collected. SCOFF questionnaire was used to examine the prevalence of positive screens for ED. Logistic regression analyses were conducted with the use of weight loss supplement as the dependent variable.

**Results:** The use of weight loss supplements was significantly associated with a positive SCOFF ( $p = 0.019$ ), and users had a 1.7 times higher risk of having a positive screen for ED. Moreover, users of weight loss supplements were more likely to have attempted and failed many weight loss diets ( $p < 0.001$ ) and were more likely to have used Orlistat ( $p = 0.004$ ) for weight management.

**Conclusions:** Our results revealed a significant association between the use of weight loss supplements and a positive screen for ED.

**Disclosure of Interest:** None declared.

### SUN-PO195 COMPARISON OF SIX NUTRITIONAL SCREENING TOOLS IN PATIENTS WITH HEMATOLOGIC MALIGNANCIES IN THE ERA OF THE GLOBAL LEADERSHIP INITIATIVE ON MALNUTRITION (GLIM) CRITERIA

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**Rationale:** Poor nutritional status is a significant negative prognostic factor for patients with hematologic malignancies as it adversely affects prognosis. In light of the newly developed criteria of the Global Leadership Initiative on Malnutrition, we compared the performance

of six malnutrition screening tools in patients with hematologic malignancies to determine the most efficient.

**Methods:** We conducted a questionnaire-based study on patients with hematologic malignancies (outpatient and hospitalized). We then calculated the following scores: MNA-SF, MUST, SNAQ, NRI, NRS-2002, and MST and compared their positive predictive value, LR, sensitivity and specificity.

**Results:** In total, 131 patients were included. Among the inpatients (n = 58), MNA-SF had the highest sensitivity (100%) but the lowest positive predictive value and LR+ (36.36% and 2.032 respectively), whereas SNAQ was the most specific tool (78.9%) and had the highest LR+ (3.869). MUST had a sensitivity of 95% and LR+ 2.96. In the outpatient group (n = 73) apart from MST and NRI all the other tools had a sensitivity of 100% and SNAQ again had the highest specificity and LR+ (78.8% and 4.717 respectively). Moreover, inpatients scored significantly less in the MNA-SF (40% inpatients and 62.5% outpatients had a score of 12–14/normal nutritional status, p = 0.03).

**Conclusions:** All things considered, SNAQ seems ideal due to its simplicity and efficacy. Among inpatients SNAQ and MUST appear superior due to their high LR+ and sensitivity, while SNAQ performed better among outpatients. This could be explained by the cutoffs used in the parameters of these two scores, which are sensitive enough but still do not allow false positive results. The study is still ongoing with the inclusion of more patients.

**Disclosure of Interest:** None declared.

#### SUN-PO196

##### VALIDITY OF THE PG-SGA AND PG-SGA SF AGAINST GLIM CRITERIA TO IDENTIFY MALNUTRITION IN CANCER OUTPATIENTS

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**Rationale:** In cancer centres, a valid malnutrition assessment tool is important for early identification and nutrition intervention. The aim of this study was to identify malnutrition prevalence in cancer outpatients and test the validity of the Patient-Generated Subjective Global Assessment (PG-SGA) and Short Form (PG-SGA SF) against the criteria by the Global Leadership Initiative on Malnutrition (GLIM).

**Methods:** In a 2-week cross-sectional study in adult cancer outpatients receiving intravenous treatment, we assessed: 1) PG-SGA SF (cut off score  $\geq 6$ ); and 2) PG-SGA against GLIM criteria (6-month weight loss  $> 5\%$ , BMI  $<$  age-specific reference, handgrip strength  $< 25$ th percentile of age- and gender specific normative values<sup>1</sup>). Sensitivity of  $\geq 80\%$  and specificity of  $\geq 60\%$  were deemed acceptable.

**Results:** Out of 275 outpatients, 246 consented to participate in the study (74.0% females, age 61.9  $\pm$  13.1). The prevalence of moderate or severe malnutrition was 21.5% via PG-SGA and 20% via GLIM+handgrip strength. Compared to GLIM+handgrip strength, the 1) PG-SGA SF had a sensitivity of 68.8%, specificity of 82.5% and kappa = 0.15; and 2) PG-SGA had a sensitivity of 44.9%, specificity of 89.3% and kappa = 0.37.

**Conclusions:** Approximately 1 in 5 outpatients with cancer were malnourished. PG-SGA and PG-SGA SF were not sensitive or specific enough to identify malnutrition and had low agreement with GLIM.

#### Reference

1. Dodds RM *et al.* Grip strength across the life course: normative data from twelve British studies. *PLoS One*. 2014 Dec 4;9(12):e113637. doi: 10.1371/journal.pone.0113637. eCollection 2014. PubMed PMID: 25474696; PubMed Central PMCID: PMC4256164.

**Disclosure of Interest:** None declared.

#### SUN-PO197

##### VALIDITY OF THE PG-SGA AND PG-SGA SF AGAINST GLIM CRITERIA TO IDENTIFY MALNUTRITION IN CANCER OUTPATIENTS

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**Rationale:** In cancer centres, a valid malnutrition assessment tool is important for early identification and nutrition intervention. The aim of this study was to identify malnutrition prevalence in cancer outpatients and test the validity of the Patient-Generated Subjective Global Assessment (PG-SGA) and Short Form (PG SGA SF) against the criteria by the Global Leadership Initiative on Malnutrition (GLIM).

**Methods:** In 246 adult cancer outpatients receiving intravenous treatment, we assessed: 1) PG-SGA SF (cut off score  $\geq 6$ ); and 2) PG-SGA against GLIM combined with low handgrip strength (25th percentile of age- and gender specific normative values<sup>1</sup>). Sensitivity of 80% and specificity of 60% were deemed acceptable.

**Results:** The prevalence of moderate or severe malnutrition was 21.5% via PG SGA and 20% via GLIM+handgrip strength. Compared to GLIM + handgrip strength, the 1) PG-SGA SF had a sensitivity of 68.8%, specificity of 82.5% and kappa = 0.15; and 2) PG SGA had a sensitivity of 44.9%, specificity of 89.3% and kappa = 0.37.

**Conclusions:** Approximately 1 in 5 outpatients with cancer were malnourished. PG-SGA and PG-SGA SF were not sensitive or specific enough to identify malnutrition and had low agreement with GLIM.

#### Reference

1. Dodds RM *et al.* Grip strength across the life course: normative data from twelve British studies. *PLoS One*. 2014 Dec 4;9(12):e113637. doi: 10.1371/journal.pone.0113637. eCollection 2014.

**Disclosure of Interest:** None declared.

#### SUN-PO198

##### THE PREVALENCE OF MALNUTRITION ACCORDING TO THE NEW GLIM DEFINITION IN CHRONIC SMALL AND LARGE INTESTINAL DISEASES

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**Rationale:** In chronic small and large intestinal diseases (inflammatory bowel disease IBD or short bowel syndrome SBS) malabsorption often causes malnutrition (MN) and its diagnosis is a challenge due to complexity of both inherent disease as well as malnutrition symptoms. Recently, the European Society for Clinical Nutrition and Metabolism ESPEN presented new GLIM (Global Leadership Initiative on Malnutrition) criteria for the diagnosis of MN<sup>1</sup>. The aim of this prospective pilot study was to evaluate the association between MN according to GLIM as well as other nutritional assessment criteria in patients with IBD and SBS.

**Methods:** Nutritional status was prospectively assessed in 20 pts with IBD or SBS by NRS and SGA, mid-upper arm circumference (MUAC), triceps skinfold thickness (TST), serum albumin and BIA. MN was

classified according to novel GLIM criteria. Prospective follow-up was performed in 6-month.

**Results:** Screening at baseline showed an increased risk of MN in 65% of pts by NRS >3 and SGA B+C. According to GLIM criteria 85% of this group were malnourished but no correlation between severity of malnutrition acc. to GLIM and grades of screening scores was observed. Pts with no risk of malnutrition (score NRS 0–2, SGA A) account to 35%. According to GLIM criteria were 85% of this pts without MN. MN according to GLIM criteria was strongly associated with poorer results for BMI (19.4 ± 3.0 vs. 25.8 ± 3.3;  $p < 0.001$ ), TST (7.5 ± 3.9 vs 15.8 ± 6.0;  $p = 0.006$ ), MUAC (23.9 ± 3.4 vs. 30.9 ± 3.5;  $p < 0.001$ ), BCM (19.2 ± 6.2 vs. 25.7 ± 6.3;  $p = 0.037$ ), FFM (42.6 ± 9.4 vs. 55.3 ± 12.4;  $p = 0.016$ ) and serum albumin (40.4 ± 7.7 vs. 47.7 ± 1.1) while no differences were found in 'etiologic criteria': 'reduced food intake' and 'inflammation condition' between the MN group and the group without MN. 6 month follow-up showed comparable results for the diagnosis of MN according to the GLIM criteria. An increased risk of malnutrition was found in 58% pts according to SGA and NRS; 85% of pts from these were also malnourished by GLIM-criteria but again no statistical correlation between MN acc. to GLIM or NRS/SGA was detected.

**Conclusions:** Our study confirms that the new GLIM definition for the diagnosis of MN is reliable for patients with IBD and SBS. Further studies with larger patient numbers and specific subgroups group are needed to assess the validity of this new MN criteria. However, strong association between 'GLIM malnutrition,' BIA results, anthropometry and serum surrogates were observed. Careful monitoring of these risk factors as well as meticulous management of complications are thus mandatory for improvement of malnutrition in these challenging pts.

#### Reference

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**Disclosure of Interest:** None declared.

#### SUN-PO199

##### ANTHROPOMETRY AS PREDICTIVE FACTOR OF FFMI IN THE ASSESSMENT OF MALNUTRITION IN ELDERLY NURSING HOME RESIDENTS

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**Rationale:** The objectives of the study were to assess the prevalence of malnutrition in institutionalized elderly people, to investigate the relationship between fat free mass index (FFMI) and malnutrition, and to assess if several anthropometric parameters could be good predictors of FFMI.

**Methods:** In this cross-sectional study we enrolled 327 elderly people living in five public nursing homes. For the assessment of nutritional status we used MNA and the new ESPEN criteria of malnutrition. Relationships between anthropometric parameters and FFMI were explored using Pearson's correlation coefficient (r). Multiple linear regression analysis was performed to determine functional predictor variables for FFMI that could be easily measured by clinicians.

**Results:** mean age of was 84.3 years (±8.1) and 66.1% were females. Prevalence of malnutrition according to MNA was 24.7% and according to the ESPEN definition of malnutrition was 16.6%. FFMI was significantly correlated with all measured circumferences (arm, arm muscle, calf), with body mass index and with handgrip strength

(table 1). Multiple linear regression analysis confirmed some anthropometric parameters as predictive factors of FFMI.

**Table 1**

Pearson correlation analysis: correlations between FFMI and measured anthropometric parameters and handgrip strength

	Total		Females		Males	
	r	p	r	p	r	p
BMI	0.706	0.0001	0.688	0.0001	0.732	0.0001
AC	0.453	0.003	0.360	0.004	0.716	0.0001
CC	0.529	0.0001	0.484	0.003	0.725	0.001
AMC	0.495	0.003	0.247	0.004	0.789	0.0001
Handgrip strength	0.516	0.001	0.243	0.003	0.384	0.002
NC	0.608	0.001	0.498	0.004	0.712	0.002

**Conclusions:** There is a high prevalence of malnutrition in elderly nursing homes residents. Anthropometric parameters and FFMI have a good correlation. Neck circumference could be a good alternative anthropometric parameter to assess nutritional status especially in elderly women.

**Disclosure of Interest:** None declared.

#### SUN-PO200

##### USE OF A MOBILE MEXICAN DIETARY ASSESSMENT APP TO EVALUATE DIFFERENCES IN DIETARY INTAKE AMONG SUBJECTS WITH AND WITHOUT TYPE 2 DIABETES

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**Rationale:** The use of Information and Communication Technologies (ITCs) as a strategy to use the data collected from a mobile app for dietary assessment; in order to understand the relationship between diet and health outcomes, in an accurate assessment of dietary intake in people with and without type 2 diabetes (T2D).

**Methods:** We retrieved dietary and demographic information from a mobile app for dietary assessment called SMAE in diabetic and non-diabetic Mexican population (n = 44,428). Only 10% had complete dietary and demographic data and met T2D criteria, while 90% had complete demographic and dietary records. The groups were composed primarily of females and had overweight. T2D group had a mean age of 37 years old while the healthy subjects had a mean age of 30 years. Multivariate analyses were performed in order to assess the variability and differences between these two study groups

**Results:** Using PCA, we identified two major components that accounted for the 48.5% variance among the study groups. These components were characterized mainly by beans, cereals & bread, sugars, fat and meat & poultry on the T2D study group. Moreover, the dietary group's assessment of the healthy study group was characterized by fruits, vegetables, beans, sugar, and milk. The differences between study groups were identified by LDA where the main variables discriminating both study groups were carbohydrate content, age, protein, fiber, and lipid content.

**Conclusions:** The data retrieved from this mobile app was used to evaluate the dietary composition among patients with T2D compared to a healthy group. The usage of ITCs in nutrition to self-monitor dietary intake is now a practical alternative to paper-based systems. Moreover, the data retrieved from these dietary assessment mobile apps can be used to generate further studies to evaluate dietary composition on different chronic diseases.

**Disclosure of Interest:** None declared.



### SUN-PO201 ONE YEAR MONITORIZATION RESULTS OF PATIENTS WHO RECEIVE CLINICAL NUTRITION TREATMENT

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**Rationale:** While providing nutrition treatment recording the process by nutrition support team (NST) becomes important to monitor and make changes in the plan when needed. Knowing the current nutrition treatment processes is important for institutions also to develop protocols.

The aim of the study was to evaluate the demographic data and treatment course of the patients who were followed up by the NST in a university hospital in respect to reaching the energy goals.

**Methods:** All patients who were admitted to the hospital and followed up by NST in 2018 a in the study. Patient's data (demographic, laboratory findings, etc.) were prospectively recorded by NST and analyzed retrospectively after the follow-up period. The analyses were performed by SPSSversion23.

**Results:** A total of 681 patients were included in the study. Of the patients, 411 (60.4%) received parenteral (PN), 246 (36.1%) enteral (EN) and 24 (3.5%) supplemental parenteral nutrition (SPN) treatment. The median age of the patients was 63 (18–96), the median time to nutritional therapy was 0 days (0–15 days) and the median follow-up period was 10 days (1–144 days). The most common access route was the nasogastric (166, 61.5%) route for EN and the peripheral route for the PN (266, 61.1%). Only 54.3% of all patients reached 80–100% of the energy goal. It was found that 61.3% of the patients who received PN treatment and reached the energy goals have central access route ( $p < 0.001$ ). Reaching targets according to the access route is given in the Table.

**Table 1**

Level of targets	EN treatment	PN treatment	SPN treatment
Reaching 80–100% of target	175(71.1)	175(42.6)	22(91.66)
Reaching 60–79% of target	26(10.6)	109(26.5)	0(0)
Reaching 50–59% of target	14(5.7)	57(13.9)	2(8.34)
Reaching 49 or less of target	31(12.6)	70(17.0)	0(0)
Total	246(100)	411(100)	24(100)

**Conclusions:** Nearly half of the patients could not reach their energy goals. In patients who received PN treatment, the goals are less achievable through a peripheral route. With the SPN, the rate of reaching nutritional goals increases.

**Disclosure of Interest:** None declared.

### SUN-PO202 COMPARISON OF NUTRITIONAL RISK SCREENING TOOLS FOR PREDICTING MORTALITY IN HOSPITALIZED OLDER ADULTS: 2-YEAR PROSPECTIVE STUDY

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**Rationale:** There are numerous screening tools to assess nutritional status of the patients, but it is unclear whether these screening tools can successfully predict worse outcomes. This study aimed to determine which nutritional assessment method had the highest prognostic significance for predicting long-term mortality in hospitalized older adults.

**Methods:** This prospective study included 231 hospitalized patients from December 2013 to March 2014. Nutritional status of the patients was evaluated using The Malnutrition Universal Screening Tool (MUST), the Subjective Global Assessment (SGA), and the Nutritional Risk Screening-2002 (NRS-2002) within 48 hours of the admission. Patients were followed-up for 2 years. The primary endpoint was all-cause mortality.

**Results:** In total, 231 patients were included in the cohort, mean age was  $58.8 \pm 16.1$  years and 131 (56.7%) of them were female. Malnutrition or malnutrition risk was identified in 38.1% of the patients with NRS-2002, in 37.2% of the patients with SGA, and in 34.2% of the patients with MUST. The crude death rate at 2 years was 24.2%. Age, gender, Charlson co-morbidity index and fat-free mass index (FFMI) adjusted cox regression analyses revealed that all nutritional screening tools were significantly related to survival (SGA (hazard ratio[HR] = 4.7; 95% CI = 2.1–10.8,  $p < 0.001$ , NRS-2002 (hazard ratio[HR] = 3.4; 95% CI = 1.6–7.4,  $p = 0.002$ , MUST (hazard ratio [HR] = 3.3; 95% CI = 1.6–6.9,  $p = 0.001$ ).

**Conclusions:** In this study, three different nutritional screening tools were evaluated for long-term mortality prediction. All screening instruments were able to predict long-term mortality, but SGA seems to provide a best yield.

**Disclosure of Interest:** None declared.

### SUN-PO203 FUNCTIONAL FOOD CONSUMPTION AND ADHERENCE TO MEDITERRANEAN DIET IN ADULT POPULATION

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**Rationale:** The Mediterranean region provides countless functional foods (FF) due to its great richness and diversity of plants. FF, such as olive oil, yoghurt, garlic, tomato, wine, condiments, herbs, spices and nuts, improve health and provide a decrease in the risk of some diseases. It is well known that the Mediterranean Diet (MD), which is considered as a good example of a functional diet, is rich in functional dietary components including phenols, flavonoids, isoflavonoids, phytosterols, phytic acid and n-3 fatty acids. The aim of this study was to assess the relationship between Mediterranean Diet Adherence Screener (MEDAS) scores and functional FF consumption.

**Methods:** This cross-sectional study was conducted with 1650 healthy adults, with the mean age  $28.19 \pm 9.42$  years. MEDAS was administered to the participants. Consumption of functional foods was questioned. Dietary intake of participants was assessed using 24-h dietary recall by intern dietitians. Data were analysed using the Statistical Package for the Social Sciences (SPSS), version 22.0.

**Results:** More than half of the participants (59.0%) were women. The mean MEDAS score of FF consumers and FF non-consumers were  $5.83 \pm 2.11$  and  $5.39 \pm 2.23$ , respectively ( $p < 0.01$ ). In addition, there were significant differences in the intake of some functional food components (namely fibre, calcium, magnesium and folic acid) between FF consumers and FF non-consumers ( $p < 0.05$ ). Moreover, binomial logistic regression analysis demonstrated that adherence to Mediterranean diet was a significant predictor of FF consumption (OR: 0.911; 95% CI: 0.870–0.953;  $p < 0.05$ ).

**Conclusions:** Consumption of FF is an important part of MD which is linked to significant reduction in overall mortality and morbidity, inspiring a beneficial dietary approach in the management of CVD,

type 2 diabetes, obesity, inflammatory diseases, degenerative diseases and cancer.

**Disclosure of Interest:** None declared.

#### SUN-PO204

##### NUTRITIONAL STATUS OF HOSPITALIZED SURGICAL PATIENTS ACCORDING TO THE RISK OF SARCOPENIA

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**Rationale:** Currently the risk of sarcopenia can be evaluated through of the SARC-CalF questionnaire (1). Considering that, the association between nutritional status and the risk of sarcopenia has been still scarcely investigated, this study aimed to investigate this association in hospitalized surgical patients.

**Methods:** A cross-sectional study was carried out with surgical patients admitted in a hospital at Porto Alegre (Rio Grande do Sul, Brazil). The nutrition assessment was performed in the first 48 hours and comprised anthropometry (current weight, mid-arm circumference, body mass index, and adductor pollicis muscle thickness), hand muscle strength by dynamometry, malnutrition diagnosis according to Subjective Global Assessment (SGA), and risk of sarcopenia by SARC-CalF questionnaire (composed by five questions and the measurement of calf circumference). Student, Mann-Whitney, Chi-square tests and logistic regression was performed for statistical analysis. The protocol was approved by the Ethical Committee.

**Results:** A total of 153 patients were included (58.14 ± 14.6 years; 50.4% women). The main medical specialties were oncology (24.4%), general surgery (23.5%) and nephrology (20.2%). The main surgical propose was curative (83.9%). The risk of sarcopenia was identified in 20.6% of the sample and 30.5% was diagnosed as malnourished (23.1% as moderate and 7.4% as severe malnutrition). All indicators of nutrition status were significantly lower in patients with risk of sarcopenia compared to those without risk of sarcopenia ( $p < 0.05$ ). In multiple logistic regression (adjusted for gender and age), patients with risk of sarcopenia presented higher odds of malnutrition compared to patients without risk sarcopenia (OR = 6.28; CI95% 2.03–19.45).

**Conclusions:** Patients with risk of sarcopenia presented worse nutritional status assessed by different parameters and 6.3 times higher odds of malnutrition compared to patients without risk of sarcopenia.

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**Disclosure of Interest:** None declared.

#### SUN-PO205

##### IS NUTRITION SCREENING IN THE COMMUNITY WITH COMMONLY USED SCREENING TOOLS REALISTIC AND PRACTICABLE?

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**Rationale:** Nutrition screening is recommended to identify people who are at risk of malnutrition and who might benefit from nutritional

intervention. However, there is anecdotal evidence that it is not always carried out. The aim of this study was to identify issues associated with obtaining data required for nutrition screening in the community.

**Methods:** 231 participants (aged ≥60 years) who had accessed GP or community-based voluntary services in the previous three months were recruited as part of an observational study. Participants were assessed at baseline in their own homes to determine nutrition risk status using two screening tools, MUST (Elia, 2003) and NRS-2002 (Kondrup et al., 2003). Data were collected on weight, height, weight change and change in dietary intake. Where participants were unable to provide data on height or previous weight, medical records were searched by the principle investigator (CEW) for the relevant data, and the time taken to undertake the searches was recorded.

**Results:** 150 (65%) participants were female; mean age 73.8 (±8.5) years, weight 72.6 (±15.9) kg and BMI 26.2 (±5.2) kg/m<sup>2</sup>. Four (2%) participants could not be weighed because they were unsafe to stand on the portable weighing scales. Data regarding height were obtained for all participants. 195 (85%) participants provided a recalled height. In 24 (10%) participants height was measured using a portable stadiometer, and in 12 (5%) a search in the medical records was required. Obtaining information on previous weight was more problematic (see Table). In this population, only 91 (39%) participants could provide a weight within the time period used by both screening tools i.e. previous 3–6 months, and 45 (19%) could only provide a weight that was from more than one year ago. Of more concern was the fact that 75 (32%) participants were unable to provide any information on their previous weight. However, 25 (11%) participants were able to report that they had observed weight loss in the previous 3–6 months (even if they could not quantify the amount lost) and 30 (13%) participants reported reduced dietary intake in the same time period.

**Table 1**

Time period in which the person could recall their weight	Number (%) able to provide weight data
3–6 months	91 (39%)
6–12 months	20 (9%)
>12 months	45 (19%)
No idea of previous weight	75 (32%)

The medical records of 148 (64%) participants were searched for data on height or previous weight and the researcher was required to search up to four different local IT systems to obtain the information. The mean time to undertake the searches was 8 (±11) minutes per participant.

**Conclusions:** This study shows there are practical issues involved in obtaining timely and accurate data required for nutrition screening in the community, with implications for staff time and resources. This might partially explain reported poor rates of nutrition screening in the community.

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#### SUN-PO206

##### OSTEOPOROSIS IS ASSOCIATED WITH CHEMOTHERAPY TOXICITY AND RELAPSE AMONG NON METASTATIC BREAST CANCER PATIENTS. EXPERIENCE FROM A SINGLE MEXICAN INSTITUTION

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**Rationale:** Among premenopausal women, osteoporosis is related to low muscle mass, postmenopausal osteoporosis which is mainly driven by the low estrogen levels. Sarcopenic is associated with worse prognosis

**Methods:** Stage I-III of breast cancer were included and treated with chemotherapy (neo)adjuvant. bone mineral density were assessed by bone densitometry of the spine and hip (dual energy x-ray [DXA]), score T -2.5 SD was used to define osteoporosis

**Results:** 221 patients were included. Median age at diagnosis were 49 years-old (23–81), 19% (n=43) has osteoporosis. chemotherapy toxicity grade 3/5, were 65.1% and 39.7% for osteoporosis vs normal bone density p=0.019. Breast cancer relapses were 14% vs 1.3% respectively p=0.006. There were no differences in mortality.

**Conclusions:** Osteoporosis is present in 19% of patients. It is associated with higher incidence of chemotherapy toxicity as well as more disease relapses. Understanding the mechanisms of the osteoporosis along with obesity and low muscle mass is important to initiate preventive strategies

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#### SUN-PO207

**ARE THE NUTRITIONAL MINI NUTRITIONAL ASSESSMENT (MNA) SCALE USED IN OUR HOSPITAL AS PART OF THE NUTRITIONAL SCREENING RISK PROTOCOL (NRSP), GOOD PREDICTOR OF MALNUTRITION ACCORDING TO THE GLIM CRITERIA?**

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**Rationale:** There is evidence supporting the use of nutritional screening methods at hospital admission for early detection and treatment of malnutrition (MN). Our hospital developed a NRSP using a validated screening tool Nutritional Risk Screening 2002 (NRS-2002) and a combination of evaluation tests (MNA, subjective global assessment -SGV) and complementary data to obtain a nutritional diagnosis.

**Methods:** Once developed and established the NRSP we intended to evaluate whether MNA is effective and correctly oriented toward the complete nutritional diagnosis according to new GLIM criteria. We established a NRSP in which nursing complete first part of NRS-2002 scale at hospital admission in medical services patients older than 65 years. If any of the questions are affirmative a full nutritional assessment is performed using MNA scale and complementary data. Finally, it is carried out a nutritional diagnosis by GLIM criteria. Once the data was collected statistical study is conducted to evaluate the current operation of the NRSP and propose improvement initiatives.

**Results:** 94 patients were finally included of which 50% (n=47) were men. The middle age was 80.2 years and the average length of stay of 12.39 days. Of these patients 50% (n=47) had moderate to severe malnutrition and the other half were well-nourished according to GLIM criteria. The combined MNA (Combined MNA = MNA part 1/12)\* 30) was calculated to obtain a comparable approximation to the complete MNA. The mean MNA showed a score of 19.38 indicative of risk of malnutrition. It had also been assessed the MNA is a good predictor of nutritional status according to GLIM criteria.

**Conclusions:** According to data we can conclude that higher punctuations of NRS-2002 and lower punctuations of MNA are statistically significant related to moderate-severe malnutrition. However, a large number of malnourished patients would not have been detected with MNA due to the score of the scale. It could be as a result as the weight loss factor, underestimated in MNA or overestimated in the GLIM criteria but we need more data to draw conclusions. Taking into account the results, we set ourselves the objective of continuing the research recording one by one MNA scale items to study the relation between them and GLIM diagnosis criteria and also try to assess the concordance between NRS-2002, MNA and GLIM diagnosis criteria.

**Disclosure of Interest:** None declared.

#### SUN-PO208

**COMPARISON OF PREDICTED VERSUS MEASURED RESTING ENERGY EXPENDITURE IN PATIENTS WITH NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD)**

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**Rationale:** Non-alcoholic fatty liver disease (NAFLD) with prevalence of 25% is a major global health problem. There is currently no standardized pharmacological treatment and the only proven effective therapeutic strategy is based on a weight reduction, an adequate diet and a regular physical activity. The aim of this study was to assess nutritional status, diet quality and determine the concordance between measured resting energy expenditure (REE) with calculated values, using 5 different equations.

**Methods:** We enrolled 13 patients with mean age of 53,77 ± 9,34, diagnosed with NAFLD by the standard diagnostic algorithm procedure and tools including ultrasound. Anthropometric parameters were measured, intake of energy and nutrients were assessed by 3-day food diary, resting energy expenditure was measured by indirect calorimetry (Cosmed Quark CPET) and compared to the resting energy expenditure calculated using 5 different equations (Harris-Benedict, Mifflin-St. Jeor, Schofield, Ikeda, Huang). In order to determine the most predictive equation, we calculated the mean difference (BIAS) and Root Mean Squared Error (RMSE) for each calculated value with regard to measured REE.

**Results:** The average BMI of the patients was in obese category (31,15 ± 4,28 kg/m<sup>2</sup>), the average waist circumference was 103,80 ± 10,30 cm and average body fat percentage was 35,32 ± 8,49%. The



average energy intake of patients was  $1734,50 \pm 497,86$  kcal, significantly less than their measured energy needs ( $2403,65 \pm 498,10$  kcal) ( $p = 0,0002$ ) that implies patients were following a reduction diet or they underestimated their food intake. The results show that the patients had high intake of fats, especially saturated fatty acids, and that the intake of dietary fibers, vitamins A, D and E, as well as magnesium was insufficient. The lowest BIAS and RMSE (97,86 and 194,80, respectively) were calculated for the Schofield equation, while the same values were highest in case of the Ikeda equation (279,69 and 336,47, respectively). Most of predictive equations underestimated REE in NAFLD patients in the present study.

**Conclusions:** Nutrition status and diet quality indicate the features of metabolic syndrome, while diet quality is characterized by high saturated fat intake and insufficient intake of micronutrients and fiber. By comparing measured with calculated resting energy expenditure it was found that the Schofield equation is the most appropriate equation for calculating energy needs among patients with NAFLD.

**Disclosure of Interest:** None declared.

### SUN-PO209

#### HOW NUTRITION SUPPORT TEAMS DEAL WITH ETHICAL ISSUES?

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**Rationale:** Nutrition support teams (NSTs) frequently face ethical issues in clinical practice. Clinical ethics can help nutrition support professionals (NSP) to identify, understand and solve common ethical issues related to patient care (1). The purpose of this survey was to investigate how NSTs dealt with ethical issues in Colombia.

**Methods:** A cross-sectional study was performed in May 2018 through the administration of an online questionnaire to all the Colombian NSTs registered in a national database. Descriptive measures were obtained.

**Results:** A total of 54 NSTs were surveyed, and 30% of them belonged to public hospital. Their main activities were nutritional care (100%), education (92%), research (75%) and administrative (83%). Clinical practical guidelines on clinical nutrition were used by 87% of the NSTs. The NSTs were integrated by physicians (91%), dieticians (96%), nurses (89%) and pharmacists (85%).

The majority of the NSTs considered nutritional therapy as a medical intervention as well as a basic support (74%), as a medical intervention (13%), as a basic support (5%), and none (8%). The ethical dilemmas and issues were faced mainly by the NSTs with the patient and/or family (42%), by the institutional Committee on Ethics (24%), by the NSTs themselves (15%) and by the NSPs by themselves with the patient and/or family (11%). It is noteworthy that 8% of the NSTs affirmed that they hadn't faced the ethical issues and dilemma. Even if the majority of the NSTs claimed that they had dealt with ethical issues and dilemma (92%) all of the NSTs claimed that they hadn't used any methodology to solve them.

**Conclusions:** The way the NSTs dealt with ethical dilemmas and issues in Colombia was heterogeneous. Special efforts should be aimed at education and sensitizing the NSPs in clinical ethics.

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### SUN-PO210

#### NUTRITIONAL ASSESSMENT OF HOSPITALIZED PATIENTS WITH CANCER WITH TWO TOOLS: PGSGA & NRS 2002

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**Rationale:** Nutritional assessment of patients with cancer is strongly recommended in order to take precautions against malnutrition which may decrease the efficacy and tolerance of the treatment and may cause prolonged hospitalization. ESPEN recommends identifying the patients at risk of malnutrition by validated tools for treating accordingly. Therefore this study was conducted to determine the nutritional risk of hospitalized patients with cancer with two scales: PGSGA & NRS 2002.

**Methods:** This cross-sectional and descriptive study was conducted between the dates of November 2018 – March 2019 at Aydin Adnan Menderes University Faculty of Medicine Hospital with patients hospitalized in the oncology unit. Data were collected with a structured questionnaire form, and two nutritional screening & assessment tools: Patient Generated Subjective Global Assessment (PGSGA) Scale and Nutritional Risk Screening (NRS 2002) with a face-to-face interview after obtaining oral consent from the patients. Data were analyzed with SPSS 16.0.

**Results:** Nutritional screening was performed in 167 hospitalized patients with cancer (65.9% were men, 34.1% were women, and the mean age was  $61.7 \pm 12.5$  years). Gastrointestinal system (GIS) cancers were seen in 43.1% of the patients. Chemotherapy (38.9%), chemo + surgery (35.3%), chemo+radiotherapy (12.0%) were applied. Total mean PGSGA score in men and women were  $5.5 \pm 2.5$  and  $6.5 \pm 2.8$ , respectively ( $p = 0.024$ ). Total mean NRS 2002 score in men and women were  $2.3 \pm 1.0$  and  $2.2 \pm 1.0$ , respectively ( $p = 0.324$ ). According to PGSGA; 44.9% of the patients were well nourished, 29.9% had moderate/suspected malnutrition and 25.1% were severely malnourished. NRS 2002 results showed that 39.5% of the patients had nutritional risk (NRS 2002 score  $\geq 3$ ) which meant that a nutritional plan should be started, while 60.5% of the patients should be regularly screened once a week during hospitalization. It was found that the two scales were correlated ( $p < 0.001$ ).

**Conclusions:** It was concluded that concurrently performed multi-tools for nutritional screening may help not miss any patient who is at risk of malnutrition and/or malnourished. It was thought to be important because patients with cancer are at high risk of malnutrition due to the disease and its treatment.

**Disclosure of Interest:** D. Gunes Other: Msc. Dietitian, S. DAG Other: Dietitian, D. ONGAN Other: Phd. Dietitian.

### SUN-PO211

#### EVALUATION OF ATHELETES' FOOD CHOICES IN SCOPE OF THEIR BODY IMAGE AND EATING BEHAVIOR

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**Rationale:** Disordered eating attitude and/or body image dissatisfaction is a problem that can be seen among athletes. The aim of this study is to determine the factors that affect food choice behaviour of athletes according to their sex, eating behaviour and body image perception.

**Methods:** A total of 224 professional athletes between the age of 16–25 and from different branches participated in this study. The majority of athletes were males with 57.1%. Athletes general behaviour, eating habits, perception towards their body and their attitudes towards food choice were evaluated by face to face questionnaire. Their eating behaviours, body images and food choice attitude were assessed by 'Eating Attitude Test (EAT-40),' 'Body Shape Questionnaire (BSQ),' and 'Food Choice Questionnaire (FCQ)' respectively. The FCQ consisted of 36 items in 9 factors (health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity and ethical concern).

**Results:** Health, body weight control, and sensory appeal were the most important factors in food selection of athletes. While women tended to mostly pay attention to 'health' and 'weight control' factor when choosing food, men paid more attention to the 'sensorial appeal' and 'health' factor. It was determined that 14.7% of the athletes had eating disorder and 30.8% had body image dissatisfaction in different levels. When choosing food, athletes with the dissatisfaction of body image and/or eating disorder tended to pay more attention to 'body weight control' factor ( $p < 0.05$ ).

**Conclusions:** This study informs the readers about the importance that the athletes give to food selection and also it shows that there could be various changes in the food selection when gender differences are considered. 'Weight control' factor comes first to argue in the selection of food for athletes who have an eating disorder and/or body image dissatisfaction.

**Disclosure of Interest:** None declared.

#### SUN-PO212

##### PROGNOSTIC IMPACT OF HAND GRIP STRENGTH COMPARED TO CALF CIRCUMFERENCE FOR PREDICTING 6 MONTH MORTALITY IN PATIENTS UNDERGOING ABDOMINAL SURGERY

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**Rationale:** Muscle weakness before major abdominal surgery is a risk factor for postoperative complications, prolonged hospitalization and increased morbidity and mortality. The aim of the present study was to evaluate the predictive power of muscle strength assessment tools along with established medical and surgical parameters in terms of mortality in a sample of Greek surgical patients.

**Methods:** This was a single center, prospective observational study of 115 adult patients (56.7% female; mean age  $65.2 \pm 15.3$  years) who underwent abdominal surgery from July 2014 to October 2016. Patients were followed-up until June 2017. Nutritional assessment was performed using hand grip strength, calf circumference and serum albumin. We also evaluated anthropometric and hematological indices, recent weight loss, surgery severity, comorbidity, in hospital and 6-month mortality, length of hospital stay and postoperative complications. Statistical analysis was performed using non parametric analysis and Receiver Operating Characteristic (ROC curve).

**Results:** Overall, during the follow up period, 26 (23.1%) of patients died. As compared with calf circumference and serum albumin, HGS had the largest area under the ROC curve (AUC) for predicting 6 month mortality after adjusting for age, smoking, comorbidities, and malignancy presence. The AUCs (95% CIs) for Calf circumference, serum albumin and HGS were 0.293 (0.251–0.332), 0.398

(0.352–0.410) and 0.431 (0.375–0.498), respectively. The cut-off of HGS able to predict mortality was 20.6 kg for men and 14.2 kg for women. Using this cut-off to fit the Kaplan-Meier survival curve, the association of HGS with all-cause mortality for both genders was confirmed. Finally, in the multivariate analysis adjusted for demographic, clinical and nutritional variables, HGS remained significant predictor of mortality, independent of surgical complications.

**Conclusions:** In a group of patients undergoing abdominal surgery, hand grip strength represented higher discriminating accuracy compared to calf circumference on predicting 6-month post-operative mortality.

**Disclosure of Interest:** None declared.

#### SUN-PO213

##### CLINICAL PRACTICE GUIDELINES FOR MALNUTRITION AND USE OF NUTRITIONAL INTERVENTIONS: CHANGES OVER 6 YEARS

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**Rationale:** Clinical practice guidelines (CPG) support healthcare professionals in conducting evidence-based management of malnourished patients. The aim of this study was to evaluate the availability of guidelines for malnutrition and interventions based on these guidelines in hospitals, specifically the change from 2012 to 2017.

**Methods:** This cross-sectional multicentre study was part of the Prevalence Measurement of Care Problems (LPZ) and was conducted in 6 consecutive years (2012–2017). 15 Austrian hospitals with a total of 5650 patients participated in the study. Data were collected with a standardized questionnaire by nurse directors (organizational level) and nurses (patient level). Data were analysed with SPSS 25 using descriptive statistics and statistical tests, e.g.  $\chi^2$  test, McNemar's test, Mann-Whitney U test.

**Results:** The availability of CPGs for malnutrition increased from 6.7% in 2012 to 100% in 2017 ( $p < 0.001$ ). Interventions conducted to treat malnutrition increased accordingly during the study period. The availability of a guideline was associated with a higher frequency of nutritional interventions. The most frequently conducted interventions were the referral to a dietician, diet enrichment and food consistency adjustment. The number of patients who did not receive any intervention decreased from 70.0% in 2012 to 55.6% in 2017 ( $p < 0.001$ ).

**Conclusions:** The availability of guidelines on malnutrition increased considerably in the participating hospitals over the six-year study period. This highlights the rising awareness regarding this topic in Austrian hospitals. The frequency of CPG-based nutritional interventions for patients at risk of malnutrition rose concurrently with the increased use of guidelines. Therefore, stakeholders and hospital managers but also healthcare staff working in clinical practice should promote the implementation of CPGs for the management of malnourished patients to support the provision of evidence-based nutritional care in hospitals.

**Disclosure of Interest:** None declared.

#### SUN-PO214

##### DETERMINATION OF MALNUTRITION RISK IN PAEDIATRICS PATIENTS WITH TWO SCREENING TOOLS: IS PYMS OR STRONGKIDS EFFECTIVE?

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**Rationale:** Early diagnosis of malnutrition is thought to be important in hospitalized children to prevent the complications. Therefore, the need for early detection of malnutrition has led to the development of various nutritional screening tools. Today, seven screening tools are available for detecting the malnutrition in children admitted to hospital.

**Methods:** In this cross-sectional study, the risk of malnutrition was determined by PYMS and STRONGkids in 222 patients aged from 1 to 16 years old. Demographic data, clinical information and anthropometric measurements were recorded. The results of the anthropometric measurements and the screening tools were compared.

**Results:** According to the BMI values of the patients, 84.7% were normal and 15.3% were acute malnourished. Severe and moderate stunting was detected in 8.1% and in 11.3% of chronic malnourished patients respectively. In patients without acute malnutrition, the lower malnutrition risk was found in 55.0% of the patients with PYMS whereas in 42.9% with STRONGkids. The detection rate of the moderate risk with STRONGkids (47.1%) was higher than PYMS (22.2%). The detection rate of high malnutrition risk with PYMS (22.8%) was higher than STRONGkids (10.1%). In patients with acute malnutrition, PYMS could not detect low and moderate malnutrition risk. The detection rates with STRONGkids were 6.1% for low and 36.4% for moderate risk. STRONGkids' ability to detect patients with high malnutrition risk was lower (58.3%) than that of PYMS (100%). Significant changes were determined between the patients with low, moderate and high malnutrition risk regarding anthropometric measurements by STRONGkids ( $p < 0.001$ ).

**Conclusions:** According to anthropometric measurements, PYMS was superior for detecting acute malnutrition while STRONGkids was superior for detecting chronic malnutrition.

**Disclosure of Interest:** None declared.

#### SUN-PO215

##### DEVELOPMENT AND VALIDATION OF A FOOD FREQUENCY QUESTIONNAIRE FOR ASSESSING THE CONSUMPTION OF FOOD ITEMS RELATED TO ORAL HEALTH

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**Rationale:** Nutritional counseling is increasing in the field of paediatric dentistry. There is an inevitable need for practical tools that assess dietary intake in the epidemiological and interventional oral health studies. This study aimed to determine the reliability and validity of the Food Frequency Questionnaire (FFQ) which was developed to examine the consumption of 40 food items related to oral health in children.

**Methods:** A sample of 120 healthy children (59 girls, 61 boys), aged 2–9 years, who consulted to Department of Pediatric Dentistry, Hacettepe University, were included in this cross-sectional study. A total of 2 FFQ (at the beginning and end of the study) and three 24-h dietary recalls were conducted to the caregivers of children. The prevalence and severity of dental caries were measured using the decayed, missing or filled teeth (dmft) index. Multiple statistical methods were used to evaluate the validation of the questionnaire. Spearman correlation coefficient, weighted kappa, and intra class correlation (ICC) values were calculated.

**Results:** Spearman correlation coefficient was  $>0.5$  for lactose, calcium and phosphorus. Weighted  $k$  was  $>0.4$  for only lactose, calcium and phosphorus (0.613, 0.463 and 0.538, respectively). Spearman correlation coefficient was  $>0.5$  for energy, fat, carbohydrate, pulp, starch, lactose, glucose, polysaccharide, calcium, phosphorus, iron and zinc when it was calculated for reliability. ICC values showed that the FFQ has reproducibility for lactose and calcium (0.722 and 0.63,

respectively). Although carbohydrate, starch, polysaccharide and sucrose levels showed a positive correlation with DMFT, no significant difference was found ( $p < 0.05$ ).

**Conclusions:** The validation of FFQ for paediatric dentistry gives promising insight to the field of oral health but the results should be repeated in larger group.

**Disclosure of Interest:** None declared.

#### SUN-PO216

##### WEIGHT CHANGES RELATED TO DYSPHAGIA AND BULBAR SYMPTOMS IN MOTOR NEURON DISEASE

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**Rationale:** Oropharyngeal dysphagia (OD) occurs in 80% of patients with Motor Neuron Disease (MND). When it appears, OD contributes negatively in the evolution of MND patients, because is one of principal causes of weight loss, malnutrition and aspiration pneumonia. The influence of weight loss and BMI on survival time has recently been reported. In this study we want to know how the appearance of dysphagia and bulbar symptoms influences weight loss in patients

**Methods:** A total of 48 patients with MND were recruited from a Spanish Multidisciplinary MND Unit. A final cohort of 46 patients with different phenotypes of MND and in different stages of evolution of the disease was selected for a transversal study. These patients were classified according to the presence of dysphagia and bulbar involvement. Parameters relative to their weight variation were evaluated. Data before the diagnosis was based on patients' records and from the diagnosis of MND, all subsequent data would be recorded in their clinical history. A clinical evaluation and a videofluoroscopy was also carried out in all patients. To facilitate the interpretation of the data, the patients were grouped into 4 groups according to their evolution of MND from diagnosis: 1) those of with a recent diagnosis ( $<12$  months) ( $n = 21$ ), 2) with 1–2 years of disease evolution ( $n = 9$ ), 3) 2–5 years ( $n = 10$ ), and 4) slow progression forms of MND ( $>5$  years) ( $n = 3$ ). Weight variation was evaluated from patients' weight before the appearance of MND symptoms until their current weight

**Results:** In group 1, 16 patients presented bulbar symptoms, though 18 patients had dysphagia. The median weight loss in this group was 4.94%. For group 2, 6 patients presented dysphagia with a median weight loss of 3.98%. Group 3 was more heterogeneous, since weight gain was 12.50% and weight loss 14.84%, 8 patients had dysphagia, with a median weight loss of 1.38%. Group 4 comprised 3 spinal patients, with dysphagia symptoms and without significative weight loss. Differences in weight change according to the onset of bulbar symptoms, can be significantly found. In the case of bulbar symptoms onset prior to diagnosis (3–12 months), the median weight loss is 5.13%. When bulbar symptoms appear at the time of diagnosis (0–3 months), weight loss is 7.14% (median) and if it is 4–12 months after diagnosis, weight loss is only a 3.73% of median

**Conclusions:** Weight loss due to dysphagia is present in the cohort. As well, the time of onset of the bulbar symptoms in the progression of the disease determine their weight loss. In some cases, dysphagia can be found in MND patients without bulbar symptoms. A more accurate diagnosis of bulbar affection, would contribute to an early treatment of dysphagia, preventing weight loss and malnutrition

**Disclosure of Interest:** None declared.



**SUN-PO217**  
**VALIDATION OF A NEW PROGNOSTIC BODY COMPOSITION**  
**PARAMETER IN CANCER PATIENTS**

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**Rationale:** During the last decades, there has been growing interest in the assessment of body composition in daily clinical practice. In this perspective, the necessity of bedside, safe (non-invasive), cheap, rapid, easily interpretable and reproducible techniques has made bioelectrical impedance analysis (BIA) a valuable tool. Estimation errors associated with bioelectric impedance evaluation may affect the accuracy of body composition and its prognostic value. We evaluated the prognostic value of a new body composition parameter (creatinine height index [CHI]) obtained from bioimpedance vectorial analysis-derived body cell mass and its association with nutritional and functional status.

**Methods:** Data of Italian and German cancer patients observed prospectively until death were used (N = 1084). Multivariable models (adjusted for age, gender, hydration status, performance status, and disease's stage) were built in both cohorts to assess the association between body composition outcome parameters (low fat-free mass [FFM], <15 [females] and <17 [males] kg/m<sup>2</sup>; low standardized phase angle [SPA], <-1.65; low CHI, <510 [females] and <660 [males] mg/24 h/m) and 1-year all-cause mortality, low body mass index (BMI; <20 [<70 years] and <22 [≥70 years] kg/m<sup>2</sup>), clinically significant weight loss (WL; ≥10% in 6 months) and low handgrip strength (HG; <20 [females] and <30 [males] kg).

**Results:** Low CHI was independently associated with mortality in both Italian (HR = 1.84 [95%CI, 1.18–2.86]; P = 0.007) and German cohorts (HR = 1.52 [95%CI, 1.17–2.07]; P = 0.008). Low FFM and low SPA did not predict survival in the German cohort. In patients with low CHI, worse nutritional and functional status were observed in both study populations. Performance of models addressing the study endpoints showed substantial consistency with both cohorts, particularly of those including low CHI.

**Conclusions:** We validated a new prognostic body composition parameter, which is easier to interpret than standard nutritional parameters and may be useful for identifying cancer patients at nutritional risk, requiring early nutritional support. Its prognostic value should be confirmed in other patient populations and its sensitivity in detecting changes in protein-calorie intake is still to be investigated.

**Disclosure of Interest:** None declared.

**SUN-PO218**  
**LIVING AND CLINICAL CONDITIONS IN FEMALE WITH RESTRICTIVE**  
**ANOREXIA NERVOSA LONG AFTER INTERRUPTING SPECIALIZED**  
**TREATMENT**

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**Rationale:** Anorexia nervosa outcomes without clinical follow-up have not been thoroughly investigated to date. This study aimed to assess long-term outcome indicators in a group of women with restrictive anorexia nervosa AN (AN-R) living in southern Italy.

**Methods:** A cohort of 117 women (mean age at the first visit 20.0 ± 5.2 years, body mass index 16.1 ± 1.5 kg/m<sup>2</sup>) with AN-R who were treated from January 2000 to December 2005 and who did not undergo any regular clinical observation in our outpatient unit in the last 10 years were asked to complete a questionnaire on their present living and clinical conditions (at least 10 years after their last observation at our outpatient unit).

**Results:** Forty-four (37.6%) out of 117 patients completed the questionnaire, forty-two (35.8%) could not be reached (i.e., changed address and phone number), and 30 (25.6%) denied participation. A total of 41% (n = 21) of respondents were married or cohabiting, 55% (n = 24) obtained a university degree, and 55% (n = 24) were employed, while 6.8% (n = 3) were unemployed. Moreover, 68.2% (n = 30) of patients reported a good remission of disease symptoms. During the 10-year period without clinical follow-up, three patients required hospitalization in a psychiatric ward. The total mortality rate was 3.72%, corresponding to a standardized mortality ratio (SMR) of 6.9.

**Conclusions:** although the results of our study cannot be fully generalized, women with a history of AN-R may experience a variety of long-term outcomes: achieving expected goals in life goals or maintaining some pathological traits requiring qualified long-term nutritional and psychological support. Lastly, although the AN-related mortality rate in this study was lower than those observed in past literature, it remains the AN-related mortality rate, regarding the entire studied cohort, was lower than that in our past studies but is still considerably higher than that of the age-matched population.

**Disclosure of Interest:** None declared.

**SUN-PO219**  
**EVALUATION OF NUTRITIONAL STATUS WITH NUTRITIONAL RISK**  
**SCREENING 2002 AND SUBJECTIVE GLOBAL ASSESSMENT, ESPEN**  
**CRITERIA, AND BODY COMPOSITION AT ADMISSION IN A HOSPITAL**  
**WARD**

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**Rationale:** Nutritional risk and malnutrition are highly prevalent among hospitalized patients. Therefore, assessing patients' nutritional status may be useful in identifying patients with increased risk for morbidity and mortality. The first aim of the study was to evaluate the efficacy of two test NRS 2002 and SGA to assess the nutritional status and the malnutrition's prevalence with ESPEN criteria; secondly to show the relation with the other nutritional risk parameters: phase angle (PA) and Handgrip strength (HG).

**Methods:** This study was conducted since September 2016 to December 2017 and included 214 patients, 115 male and 99 female

(age  $65.2 \pm 15.4$  y,  $59.1 \pm 17.9$ y; body weight  $74.7 \pm 15.9$  kg,  $67.9 \pm 16.3$  kg; BMI  $25.5 \pm 4.6$  kg/m<sup>2</sup>,  $26.6 \pm 6.3$  kg/m<sup>2</sup>) admitted to the Hospital wards coming from the Emergency Unit. The SGA and NRS 2002 were administered to all patients within 72 h of admission and bioimpedance analysis (BIA) and muscle strength. were performed.

**Results:** According to SGA, 45.2% of male patients are considered well nourished (score a), 49.6% moderately malnourished (score b), and 5.2% severely malnourished (score c), whereas with NRS, 89.6% considered well-moderately nourished (score < 3), and 10.4% severely malnourished (score  $\geq 3$ ). About female patients according to SGA, 44.4% are considered well nourished (score a), 51.5% moderately malnourished (score b), and 4.0% severely malnourished (score c), whereas with NRS, 94.9% considered well-moderately nourished (score < 3), and 5.1% severely malnourished (score  $\geq 3$ ). The prevalence of malnutrition according to the new ESPEN definitions was : 9.1% in female and 3,5 in male (BMI  $\leq 18$  kg/m<sup>2</sup>), and 6.1% for each (fat free mass index < 15 kg/m<sup>2</sup> for female and < 17 kg/m<sup>2</sup> for male combined with an unintentional weight loss > 10% independent in the last three months), Therefore we also observed a strong correlation between AF and HG ( $r = 0.666$ ;  $p < 0.05$ ).

**Conclusions:** SGA and NRS appear to are useful tests to identify patients at risk for malnutrition at hospital admission from the Emergency Unit in addition to other important parameters, and with a similar prevalence to Espen criteria use. Furthermore our study confirms that both AF and muscle strength are the useful markers of nutritional status.

**Disclosure of Interest:** None declared.

#### SUN-PO220

##### THE ASSOCIATION BETWEEN SUN EXPOSURE, VITAMIN D INTAKES, AND PHYSICAL ACTIVITY WITH VITAMIN D STATUS AMONG INDONESIAN ADOLESCENTS: URBAN SETTING

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**Rationale:** The prevalence of vitamin D deficiency has increased rapidly worldwide in both children and adults, including country with abundant sun exposure as well as Indonesia. The objective of the present study was to determine the prevalence of vitamin D and its' association with behavioral factors like physical activity and exposure to sun light among healthy group of Indonesian adolescents in urban setting.

**Methods:** A total of 64 adolescents aged 15–18 years (28 boys and 36 girls) from four different senior high schools in Depok-West Java were included in this cross-sectional study. Sun exposure score, vitamin D intakes, and physical activity were determined using a standard questionnaire, and serum concentration of 25-hydroxyvitamin-D were measured using *Direct Competitive Chemiluminescence Immunoassay* (CLIA).

**Results:** The prevalence of vitamin D deficiency (25-hydroxyvitamin D serum <37.5 nmol/L) was 62.5%. This recent study found that sun exposure score ( $U = 196.5$ ,  $p = 0.000$ ) and vitamin D intakes ( $U = 257$ ,  $p = 0.025$ ) were significantly different in adolescents' serum of Vitamin D. However, there was no significant different found in physical activity ( $t(62) = 0.458$ ,  $p = 0.648$ ) in adolescents' serum of Vitamin D. Adolescents with vitamin D deficiency had a lower sun exposure score, but they had higher vitamin D intakes compared to adolescents with vitamin D sufficiency.

**Conclusions:** Vitamin D deficiency in Indonesian urban adolescents is very prevalent. Furthermore, status of vitamin D appears to have association with sun exposure, vitamin D intakes, and physical activity.

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**Disclosure of Interest:** None declared.

#### SUN-PO221

##### PHASE ANGLE IN PATIENTS WITH CONGESTIVE HEART FAILURE

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**Rationale:** Congestive heart failure (CHF) is a complex clinical syndrome manifested by cardiac muscle dysfunction and its development is closely related to nutritional status and body composition. The use of phase angle (PA), measured by bioelectrical impedance (BIA), is described as valid, even in situations with oscillations in the hydration state, and has been related to the success, survival and evolution of the disease.

**Methods:** Patients accompanied by the ICC protocol of a general hospital in São Paulo – Brazil, were included. Individuals who were unable to apply BIA (pacemaker patients and extensive metal prostheses) were excluded from the sample. Sociodemographic data (sex and age) and anthropometric data (weight, height and Body Mass Index – BMI) were obtained with the help of Toledo scale, capacity 150 Kg and sensitivity 100 g, of a portable X-ray stadiometer. The functional class (FC) of CHF was established according to the New York Heart Association criteria, described in the Brazilian Guideline for CHF (2018). To obtain PA and muscle mass, the results of the BIA test performed with the BCM-Fresenius instrument were used.

**Results:** The study included 24 subjects with a mean age of 81,4 ( $\pm 10,58$ ) years. The sample was composed of 19 (79.2%) men and 5 (20.8%) women, with mean PA of 3,79° ( $\pm 0,98$ ). In relation to the functional class and PA 2 (8.3%) patients were FC II with mean PA of 5,22° ( $\pm 1,35$ °); 13 (54.2%) were FC III with mean PA of 3,95° ( $\pm 0,90$ °); 9 (37.5%) were FC IV with mean PA of 3,25° ( $\pm 0,66$ °). As for muscle mass, 11 (45.8%) patients presented reduced values with mean PA of 3,36° ( $\pm 0,69$ ) while 13 (54.2%) presented normal values with mean PA of 4,16° ( $\pm 1,06$ ).

**Conclusions:** The present study shows that patients with higher functional class or lower muscle mass presented a lower phase angle, suggesting that PA can be a good indicator of the nutritional status and prognosis of congestive heart failure.

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**Disclosure of Interest:** None declared.

### SUN-PO222 TOOL FOR THE DIAGNOSIS AND CLASSIFICATION OF HOSPITAL MALNUTRITION BASED ON GLIM CRITERIA

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**Rationale:** Hospital malnutrition has a high prevalence and is often underdiagnosed. It leads to increased morbidity and mortality and length of hospital stay. Due to this, the main global societies of clinical nutrition were summoned to the Global Leadership Initiative on Malnutrition (GLIM), aiming to create a tool for the diagnosis of malnutrition in hospital environments.

**Methods:** A discussion group composed by nutritionists has adjusted existing tool, which is applied since 2006 for the diagnosis and nutritional monitoring of patients to the standard proposed by GLIM consensus.

**Results:** The tool called 'Nutritional Risk Tree' evaluates: food intake, chewing, swallowing, digestion, absorption, intestinal function, metabolism alteration, treatments, renal function, large surgeries, burn, pressure injury, mass index weight loss, decompensated systemic arterial hypertension, congestive heart failure, dyslipidemia and feeding pathway. After the patient is classified into: with or without nutritional risk. The instrument was effective in evaluating the phenotypic and etiological criteria, but did not classify the etiology of malnutrition. After the readaptation was established: reallocation of the criteria already evaluated in 2 groups: 1. Phenotypic: weight loss, reduced BMI, depletion of muscle mass and functionality and 2. Etiological: reduction of intake/absorption and inflammation. From this it will be defined whether the patient is malnourished or not, as well as the etiology of malnutrition. For nutritional screening, the NRS2002 will be adopted.

**Conclusions:** The tool used by the hospital already met the main criteria proposed by the GLIM consensus, but adjustments were necessary in order for the nutritional status classification to meet the most recent nutritional assessment recommendations, more efficient and individualized nutrition.

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**Disclosure of Interest:** None declared.

### SUN-PO223 CALF CIRCUMFERENCE ACCURACY FOR DIAGNOSIS OF MALNUTRITION IN HOSPITALIZED INPATIENTS

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**Rationale:** Calf circumference (CC) is indicator of muscle mass and low muscle mass is one criteria applied in different tools for malnutrition diagnosis. Cut-off point  $\leq 33$  cm for women and  $\leq 34$  cm for men were recently determined for South Brazilian population to identify low muscle mass. However, it was not tested regarding its accuracy for malnutrition diagnosis. The aim of this study was to evaluate the accuracy of CC for diagnosis of malnutrition in hospitalized patients.

**Methods:** Cross-sectional study included Brazilian hospitalized patients from two hospitals (Porto Alegre-RS and Curitiba-PR). The protocol was approved by the Ethical Committee of the hospitals. The sample was consecutively selected from all patients admitted to the hospitals within 48 hours of hospitalization. The inclusion criteria were patients with age  $\geq 18$  years that were conscious, able to move, and without oedema. Malnutrition was diagnosed according to Subjective Global Assessment (SGA). The CC was measured using an inelastic tape at the point of greatest circumference. Area under ROC curve was calculated to evaluate the performance of CC to identify malnutrition considering the Brazilian cut-off points and CC as a continuous variable to established the most accurate cut-off (high specificity with an acceptable sensibility – at least 50%). The statistical analysis were performed in SPSS 20.0 and p values  $< 0.05$  were considered significant.

**Results:** 509 patients (50.3  $\pm$  14.7 years old; 51.5% females; 66.4% white ethnicity) were included in this study (52.3% from Curitiba). The majority of patients had cancer (25.9%), followed by cardiovascular disease (19.6%) and gastrointestinal disorder (14.5%). Malnutrition was identified in 33.2% to patients according to SGA. The Brazilian CC cut-off point didn't present a good performance for identify malnutrition (AUC ROC = 0.370; CI 95% 0.312–0.428). When CC was considered as continue variable the AUC of ROC curve was equal to 0.784 (CI 95% 0.718–0.850) for men and 0.678 (CI 95% 0.602–0.753) for women. For men the cut-off point established was 34.4 cm (sensitivity = 53.7%; specificity = 82.7%) and for women it was 34.1 cm (sensitivity = 52.0%; specificity = 75.2%).

**Conclusions:** CC  $\leq 34.4$  cm presented an accuracy of 71.8% to identify malnutrition in men. For women, the performance of CC as malnutrition marker was less satisfactory. These results suggest that CC could be adopted as an indicator of malnutrition in men hospitalized, considering that, the measurement of CC is simple, non-invasive and cheap.

**Disclosure of Interest:** None declared.

### SUN-PO224 PREVALENCE OF MALNUTRITION IN A COHORT OF CROHN'S DISEASE PATIENTS ACCORDING TO THE NEW GLIM CRITERIA

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**Rationale:** Crohn's disease (CD) is a chronic inflammatory bowel disease that may alter ingestion and/or assimilation of nutrients. It is well known that CD patients may develop malnutrition and/or nutritional deficiencies. The objective of this study was to assess the prevalence of malnutrition using the GLIM criteria in CD patients at the era of new therapies such as the biologics.

**Methods:** This is a prospective study including ambulatory CD patients. The study included demographics data (age, gender), CD characteristics (duration of CD, location, degree of activity (Bradshaw index, HBI), surgical resection, current therapies). Nutrition status was assessed by SGA and the GLIM criteria (weight loss (WL), BMI, muscle function (handgrip tests), food intake and inflammation).

**Results:** 92 CD patients (47 females and 45 males) were enrolled in this study with a mean age of 46 years and a mean duration of CD of 16 years (1–62 years). 37% of the patients had undergone previous intestinal resection and 63% of the patients received immunosuppression or biologics at the time of evaluation. According to HBI, 43,48% patients had a clinical active CD. Based on the GLIM criteria, the prevalence of malnutrition was 32,6% with 18,5% and 14,1% being moderately or severely malnourished.



Malnutrition was significantly correlated with HBI ( $p < 0,002$ ), CRP ( $p < 0,032$ ) and presence of inflammation at the endoscopy ( $p < 0,05$ ). Amongst the 5 GLIM criteria, % of WL, low BMI, strength diminution, decreased oral intake and active inflammation were defined as positive in 43,33%, 23,3%, 76,7%, 56,7% and 83,3% of cases respectively. SGA and GLIM criteria were positively correlated in 63% of the patients.

**Conclusions:** Based on the GLIM criteria, the prevalence of malnutrition was 32,6% in a cohort of ambulatory CD patients. Amongst the 5 criteria, strength, decreased oral intake and the inflammation were the most frequently altered. Malnutrition was correlated with the clinical, the biological and the endoscopic activity of the disease.

**Disclosure of Interest:** None declared.

#### SUN-PO225

##### QUANTITATIVE ANALYSIS OF NUTRITIONAL RISK SCREENING TOOLS NRS 2002 AND PG-SGA IN ONCOLOGY OUTPATIENTS

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**Rationale:** In the clinical pathway of nutritional care for hospitalized patients at the Institute of Oncology Ljubljana Nutrition Risk Screening NRS 2002 (NRS 2002) has already been implemented. Now, choosing an effective tool for nutritional screening for patients treated in our outpatients department also becomes a key objective. The purpose of the study was to evaluate the use of NRS 2002 and Patient-Generated Subjective Global Assessment (PG-SGA) in outpatient department. The goal was to determine the differences in the prevalence of patients at nutritional risk (NR) and the usefulness of the two tools.

**Methods:** In one week in the 2013, 144 patients were included. The patients were interviewed by a dietitian using NRS 2002 and PG-SGA. In terms of the number of points acquired, patients were classified into three categories: not at NR (PG-SGA: 0–3; NRS 2002: 0); at moderate NR (PG-SGA: 4–8; NRS 2002: 1–2); at high NR (PG-SGA:  $\geq 9$ ; NRS 2002:  $\geq 3$ ). The data were analyzed with the statistical program SPSS 22.0, we used the t-test.

**Results:** The difference in prevalence of patients at NR was 9,6% ( $p < 0,05$ ). The prevalence by using PG-SGA was 56,2% and by NRS 2002 46,6%. PG-SGA detected 6,9% more patient at moderate NR than NRS 2002 (PG-SGA: 24,3%, NRS 2002: 17,4%). Patients at high NR were about one third, the difference between tools was smaller (PG-SGA: 31,9%, NRS 2002: 29,2%).

**Conclusions:** Although PG-SGA detected more patients at NR and included nutritional assessment and triage for nutritional support, NRS 2002 was less time-consuming and easier to perform as such was more suitable for use in our outpatient clinics. On the basis of the obtained results, we suggest the use of NRS 2002, but we recommend that nutritional support should be performed as soon as patient is at nutritional risk (NRS 2002 1-2 points).

**Disclosure of Interest:** None declared.

#### SUN-PO226

##### NUTRITIONAL RISK SCREENING IN ONCOLOGY OUTPATIENTS: SF PG-SGA VERSUS PG-SGA AND NRS 2002

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**Rationale:** Short Form Patient-Generated Subjective Global Assessment (SF PG-SGA) is a validated tool for nutritional risk

screening (NRS). Beside being shorter than PG-SGA, it can be filled by the patient himself. This is particularly important in situation with a large number of patients in our outpatient department and lack of medical staff. The purpose of the study was to evaluate the use of (SF PG-SGA), Patient-Generated Subjective Global Assessment (PG-SGA) and Nutritional Risk Screening 2002 (NRS 2002) in the outpatient department of the Institute of Oncology Ljubljana. The goal was to determine the differences in the prevalence of patients with nutritional risk (NR) using all three tools.

**Methods:** In one week in the 2013, 144 patients were included. In terms of the number of points acquired in NRS with all three tools, patients were classified into three categories: not at NR (SF PG-SGA: 0–2, PG-SGA: 0–3, NRS 2002: 0), at moderate NR (SF PG-SGA: 3–5, PG-SGA: 4–8, NRS 2002: 1–2) and at high NR (SF PG-SGA:  $\geq 6$ , PG-SGA:  $\geq 9$ , NRS 2002:  $\geq 3$ ).

**Results:** The prevalence of NR patients using SF PG-SGA was 49,3% (at moderate NR 18,0%, at high NR: 31,3%), using the PG-SGA 56,2% (at moderate NR: 24,3%, at high NR: 31,9%), using the NRS 2002 46,6% (at moderate NR: 17,4%, at high NR: 29,2%). Not at NR patients were 50,7% using the SF PG-SGA, 43,8% using the PG-SGA and 53,4% using the NRS 2002. Between SF PG-SGA and PG-SGA, the difference in prevalence was 6,9%, and between SF PG-SGA and NRS 2002 it was 2,7%.

**Conclusions:** The difference in the prevalence of NR patients between SF PG-SGA and NRS 2002 was 2,7% especially it was small in the moderate NR category (0,6%). But SF PG-SGA and NRS 2002 compared with PG-SGA detected fewer all at NR patients and not included nutritional assessment. However, SF PG-SGA in comparison with NRS 2002 may have an advantage over NRS 2002 because it includes the assessment of patients nutritional symptoms and their physical condition.

**Disclosure of Interest:** None declared.

#### SUN-PO227

##### CONCORDANCE OF DIFFERENT TOOLS FOR DIAGNOSIS OF MALNUTRITION IN HOSPITALIZED PATIENTS

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**Rationale:** There is no international consensus on a single 'best tool' for malnutrition diagnosis, and new tools were proposed by different international society of clinical nutrition recently (1–3). Considering that the concordance of these tools with Subjective Global Assessment (SGA) has been scarcely investigated until this moment, the aim of this study was to evaluate the concordance of different tools for diagnosis of malnutrition in hospitalized patients with SGA.

**Methods:** Cross-sectional study including Brazilian patients from two hospitals (Porto Alegre-RS and Curitiba-PR). The inclusion criteria were age  $\geq 18$  years, conscious and able to move patients. Malnutrition was diagnosed within 48 hours of hospitalization by SGA, Academy of Nutrition and Dietetics/American Society for Parenteral and Enteral Nutrition (AND/ASPEN), European Society for Clinical Nutrition and Metabolism (ESPEN), and Global Leadership International Malnutrition (GLIM) criteria. The kappa coefficient was calculated and interpreted as follow: 0.41–0.60 moderate; 0.61–0.80 substantial; 0.81–1.0 almost perfect.

**Results:** 509 patients (50.3  $\pm$  14.7 years old; 51.5% females; 52.3% from Curitiba) were studied. The majority of patients had cancer (25.9%), cardiovascular disease (19.6%) and gastrointestinal disorder (14.5%). Malnutrition was identified in 33.2% of patients by SGA, 36.4% by AND/ASPEN, 16.1% by ESPEN and 37.5% by GLIM. The concordance between SGA and AND/ASPEN ( $k = 0.66$ ;  $p < 0.001$ ) and GLIM ( $k = 0.69$ ;

$p < 0.001$ ) was substantial while the concordance between SGA and ESPEN criteria was moderate ( $k = 0.42$ ;  $p < 0.001$ ).

**Conclusions:** AND/ASPEN and GLIM criteria for malnutrition diagnosis had a satisfactory concordance with SGA and could be applied for nutrition assessment of hospitalized patients.

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**Disclosure of Interest:** None declared.

#### SUN-PO228

##### RISK OF SARCOPENIA AND CLINICAL OUTCOMES IN HOSPITALIZED PATIENTS: A PROSPECTIVE STUDY

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**Rationale:** The risk of sarcopenia can be assessed by SARC-CalF (1), but little is known about the prognostic value of SARC-CalF among hospitalized patients. So, the aim of the current study was to evaluate the association between risk of sarcopenia and clinical outcomes in hospitalized patients.

**Methods:** Prospective cohort study including hospitalized patients from five hospitals at Porto Alegre-RS. The Ethical Committee of the hospital approved the protocol. The inclusion criteria were age  $\geq 18$  years, conscious, able to move and without oedema patients. The sarcopenia risk was evaluated within 48 hours of hospitalization by SARC-CalF, considering the components strength, assistance in walking, rise from a chair, climb stairs and falls, and calf circumference (measured using an inelastic tape at the point of greatest point). Outcomes of interest were admission at intensive unit care (IUC), death and length of hospital stay (LHS) higher than nine days (categorized by median). Chi-square and Fisher tests, and Cox regression was performed for statistical analysis.

**Results:** A sample of 237 patients ( $54.6 \pm 15.1$  years; 54.8% females) was studied. The majority of patients had cancer (51.6%), and cardiovascular disease (18.4%). The risk of sarcopenia was observed in 18.4% of sample. The frequency of admission at IUC ( $12.5\% \times 18.6\%$ ;  $p = 0.356$ ) and LHS  $\geq 9$  ( $45.0\% \times 50.8\%$ ;  $p = 0.504$ ) did not differ between groups. The incidence of death was higher in patients with risk of sarcopenia in comparison to patients without risk of sarcopenia ( $7.5\% \times 1.1\%$ ;  $p = 0.045$ ). In the multivariate analysis (adjusted for age, comorbidities and stress of disease) a positive SARC-CalF increased the risk of death in 12.78 times (CI 95% 1.29–127.11).

**Conclusions:** Risk of sarcopenia was associated to mortality in hospitalized patients. The prognostic value of SARC-CalF in hospitalized patients requires future confirmation.

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**Disclosure of Interest:** None declared.

#### SUN-PO229

##### IS THE SCREENING TOOL FOR CONTROLLING NUTRITIONAL STATUS (CONUT) ADEQUATE FOR NUTRITIONAL SCREENING AT HOSPITAL ADMISSION?

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**Rationale:** Evaluate the prevalence of undernutrition at admission and analyse the utility of nutritional screening system (CONUT) compared with the nutritional assessment at admission at Hospital Puerta del Mar (Cádiz).

**Methods:** Prospective cohort study including patients older than 18, admitted to hospital for more than 3 days in 2018. A systematic analysis of CONUT was undertaken in general blood tests analysed during the first 3 days' admission. Positive risk was defined by CONUT  $> 4$ . Nutritional assessment was evaluated by subjective global assessment (SGA), dynamometry and biochemical parameters. The relationship between CONUT result and clinical variables, and its validity as a diagnostic test were evaluated.

**Results:** 468 patients included, 56.0% men, mean age 69.3 ( $\pm 15.4$ ). 95.7% admitted from Emergency, 59.2% multimedicated (taking  $\geq 6$  drugs) and 35.5% with diabetes. 65.7% presented with undernutrition (35.1% energy, 2.8% protein and 27.8% energy-protein undernutrition): 31.7% mild, 27.0% moderate and 7.1% severe. CONUT tool was positive in 30.2% and negative in 69.7%. Patients with CONUT positive were older. Levels of albumin were lower (3.1 vs 3.9 g/dl;  $p < 0.001$ ) and CRP higher (132.3 vs 51.9 mg/l) in CONUT positive than CONUT negative. Length of stay (LOS) was longer in CONUT positive (14.3 vs 9.9 days,  $p < 0.001$ ). 5.3% of patients studied died during their admission (12.8% CONUT positive vs 2.1% negative,  $p < 0.05$ ). Linear regression model confirmed the association between CONUT positive and LOS and mortality. Comparing with Nutritional Assessment, CONUT presented sensitivity 54.6%, specificity 91.2%, positive predictive value 84.4%, negative predictive value 69.6% and Kappa index 0.47

**Conclusions:** The prevalence of undernutrition at admission is high in our center. In our experience, although CONUT tool at admission is not well correlated to nutritional assessment (sensitivity 54.6%, Kappa index 0.47), it is a factor independently related to LOS and mortality

**Disclosure of Interest:** None declared.

#### SUN-PO230

##### EVALUATION OF THE PROTEIN TARGET IN DIETARY PRESCRIPTION IN PATIENTS WITH PRESSURE ULCERS

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**Rationale:** Inadequate nutritional Therapy(NT) has a negative impact, inducing weight and muscle mass loss and undernutrition. It negatively acts on the pathogenesis and wound healing. The objective was to evaluate the dietary prescription and protein target in patients with pressure ulcers(PU).

**Methods:** Retrospective cross-sectional data collected done by quarterly, with adults and elderly patients admitted into a private hospital in São Paulo, Brazil. Two audits were performed, in electronic records among the variables were: name, age, risk of and/or presence of PU, location and stage. In relation to PU risk, Braden Scale was considered and, regarding the presence of PU, nursing records was considered.

**Results:** This study evaluated 855 patients (47% men and 53% woman), of which 74% were notified with nutritional risk. Audited patients and Braden Scale, see below:

	Oct/2018	Feb/2019
Risk of PU	171(42%)	181(41%)
Ulcer-free	214(52%)	257(58%)
No nursing records	26(6%)	6(1%)
High Risk	56(31%)	56(31%)
Severe Risk	27(16%)	26(15%)

There was no prescription of oral nutritional supplements (ONS) in patients with high and severe risk of PU in the first (35%) and second (43%) audits. The prescribed and TN infusion was 81% and 89%. It was observed that protein prescription was adequate 57% and 65%. In patients with NT the energy and protein goals were reached, 72% and 74%, on the first (71%) and second (75%) audit.

**Conclusions:** In patients with PU, the adequacy in the protein prescribed there was improvement in 8%, the factors that prevented the adequacy: renal failure, gastric feeding intolerance and medical circumstances. In patient with high and severe risk of PUs, provision of ONS can be considered, in cases of fasting a regular evaluation to ensure effective and early TN must be performed. An effective NT and continuous management of indicators are relevant to insure a proper TN, recovery and best outcome.

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**Disclosure of Interest:** None declared.

## SUN-PO231

### DIFFERENCES IN BODY COMPOSITION BY SEGMENTAL MULTIFREQUENCY BIOIMPEDANCE BETWEEN PATIENTS IN ADVANCED CKD AND HEMODIALYSIS

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**Rationale:** The study of body composition by bioimpedance is part of the routine routine in the area of nephro-nutrition.

The segmental bioimpedance provides us in a simple and reproducible way the possibility of obtaining not only global measurements but also divided into 5 segments for better detection of problems.

**Methods:** We analyzed 276 patients with CKD  $\times$   $71.64 \pm 12.16$ , 105 in ERCA (64 men) and 171 (122 men) in HD with no difference in age between the two groups.

Differences in body composition are established by INDBODY S10 multifrequency bioimpedance between the two groups.

**Results:** We found sig difference with higher value in ERCA in: ACT (0.040), AIC (0.033), AEC (0.05), proteins (0.033), Minerals (0.020), fat-free mass (0.003), SMM (0.034), BMI (0.05), SMI (0.048), cell mass (0.03), basal metabolism (0.003). Analyzing by segments, there was no difference in the % of lean mass in the arms and legs between patients with ACKD and in HD, % fat mass in the trunk, or in AEC/ACT between the two groups. If we find in some segments difference in the ACT and its distribution.

The evolution of the values at 3, 6, 9 and 12 months is also analyzed. In the SMI no significant differences are observed over time in paired samples, if in the total body water at 6 and 12 months, in the case of the cell mass, a decrease is observed in the year measurement. With this we can both global and segmental monitor the changes in body composition and its relationship with the binomial nutrition inflammation over time.

## Conclusions:

1. There are differences in some parameters of body composition between patients in ACKD and HD.
2. The segmental distribution allows us to see the changes in hydration in the different body segments and monitor their resolution.
3. The monitoring over time of body composition with bioimpedance allows us to detect early alterations can stop their evolution and detecting their recovery with appropriate treatment.

**Disclosure of Interest:** G. Barril Speakers Bureau of: ABBOT, Nutricia, Vifor Fresenius, A. Nogueira: None declared, G. Alvarez: None declared, J. A. Schetz Tomero: None declared.

## SUN-PO232

### THE ASSESSMENT OF NUTRITION CARE PRACTICE BY NURSES AND DOCTORS OF NORTH ESTONIA MEDICAL CENTRE

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**Rationale:** Timely noticing of malnutrition depends on the awareness of doctors and nurses, but nutrition care practice also relies on how it is governed by the hospital. In order to evaluate the obstacles of implementing recommended clinical nutrition practices in hospital setting, the views of local medical practitioners need to be studied and heard.

**Methods:** An online survey with multiple-choice questionnaire among all doctors and nurses working in inpatient clinics in North Estonia Medical Centre (NEMC) was carried out to evaluate their opinions towards nutrition care practice ideal and reality in their unit and assess their compliance with the ESPEN guidelines. Nurses and doctors answers were compared.

The questionnaire used was composed by Danish researches group in 2004 and it is based on the recommendations in the guidelines of the European Society for Clinical Nutrition and Metabolism (ESPEN). It has been previously used in studies in multiple Scandinavian countries. The translation and use of the questionnaire was approved by main original author.

**Results:** 156 doctors and 607 nurses received the questionnaire via e-mail with several reminders to respond during March and April 2017. The total sample of responders was 93 (12.2%), of whom 26 were doctors and 67 nurses. Most responses were received from surgical clinic. All returned questionnaires were included to the analyses. A difference appeared in participants' expectations to and assessment of current nutritional care practice in the hospital: doctors and nurses equally ( $p=0,1-0,7$ ) complied in their opinions of appropriate



nutrition care with ESPEN guidelines (61–95%), but the concordance of practices with guidelines was assessed to be very low (5.4–39.8%).

The main obstacle for compliance to nutrition care practices according to the participants was insufficient knowledge and skills- 66% of the participants admitted that they lack knowledge to make decisions about clinical nutrition support. Other reasons for poor practice were the fear of increase in workload and of inconvenience to the patients. One clear obstacle in implementing knowledge to practice was also the uncertainty of the responsibilities and role of doctors and nurses in the process of nutrition care.

**Conclusions:** Although with limited value to the general overview of the hospital medical practitioners' opinions, the results of this study clearly demonstrated the necessity to better define the responsibilities among personnel in surgical clinic and further implement protocols and organize trainings in nutrition care.

As the study participants, doctors and nurses equally have positive attitudes towards ESPEN guidelines it is possible to overcome the few obstacles that prevent best practice of nutritional care in our hospital.

**Disclosure of Interest:** None declared.

#### SUN-PO233

##### VALIDATION OF A MALNUTRITION SCREENING TOOLS FOR HOSPITALIZED CHILDREN

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**Rationale:** Use of malnutrition screening tools (MSTs) among hospitalized pediatric patients is an easy method to properly identify children at risk of malnutrition. There are different tools developed in the English language, but there are limited data available on their validity when translated into other languages. The aim of this study was to construct a version of the Pediatric Yorkhill malnutrition score (PYMS), STRONG-kids, and STAMP in the Turkish language and determine the validity and reliability of the adaptation in a pediatric population.

**Methods:** The study was conducted in two stages. First, it was developed the process of translation of the MST PYMS, STRONG-kids, and STAMP to Turkish language. In the second stage the validity, reliability was evaluated in the new version of the tools. Anthropometric assessment was used as the reference standard to evaluate the criterion validity of the MSTs. Reliability was observed through inter-rater and intra-rater agreement. The study was conducted by a nurse and a dietitian.

**Results:** A total 202 children were included in the study, 42 of whom took part in reliability phase. The interrater agreement between one dietitian and one nurse was kappa ( $\kappa$ ) = 0.955 (95% CI 0.904–1.000) for PYMS, 0.901 (95% CI 0.828–0.974) for STRONG-kids, and 0.963 (95% CI 0.912–1.000) for STAMP (almost perfect agreement). Sensitivity of the PYMS, STRONG-kids, and STAMP were 96.8%, 38.7%, and 77.4%, respectively. Specificity of the PYMS, STRONG-kids, and STAMP were 63.7%, 88.9%, and 93.4%, respectively.

**Conclusions:** The interrater reliability of the MST PYMS, STRONG-kids, and STAMP was one dietitian and one nurse is high. While PYMS is more sensitivity to detect malnutrition risk than the STRONG-kids and STAMP, STAMP is more specificity than the STRONG-kids and PYMS according to agreement between tool results and anthropometric assessment.

**Disclosure of Interest:** None declared.

#### SUN-PO234

##### THE EFFECT OF MNUTRIC SCORE AND NRS- 2002 ON PREDICTING INTENSIVE CARE UNIT MORTALITY IN PATIENTS WITH HAEMATOLOGICAL CANCER

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**Rationale:** Haematological cancers are one of the most common types of cancer in Turkey. Intensive care unit follow-up and treatment are needed in these patients who develop treatment-related complications. The aim of this study was to investigate the effect of mNUTRIC (modified Nutric score) and NRS 2002 score (Nutritional Risk Screening-2002) on intensive care unit mortality and long-term mortality of patients with haematological cancer aged  $\geq 18$  years.

**Methods:** This retrospective study was performed at the Department of Medical Intensive Care of Erciyes University Medical Faculty. A total of 112 patients admitted to the Medical Intensive Care Unit for 1 year were evaluated retrospectively from their medical records. Patients stayed less than 24 hours in ICU were not included in the study analysis. Statistical analysis was performed on a total of 81 records. The endpoint of the study was intensive care unit mortality and long-term mortality. Categorical variables were compared using the chi-square test or McNemar test and continuous variables using Student's t-test or the Wilcoxon–Mann–Whitney test. All other statistical analysis was conducted using SPSS software (version 21.0; SPSS Inc., Chicago, IL, USA). All significance tests were two-sided; a p-value <0.05 was considered significant.

**Results:** A total of 81 people with a median age value of 56 (28) were included in the study. The median mNutric score of our patients was 6 (3), while the median value of NRS 2002 was 4 (1). According to the mNutric score, the risk of malnutrition was present in 56 (69%) of our patients, and 43 (77%) of dead patients had a risk of malnutrition and this was statistically significant ( $p < 0.001$ ). According to NRS 2002, 66 (82%) of our patients were at risk of malnutrition, and 46 (70%) of dead patients were at risk of malnutrition and this was statistically significant ( $p = 0.03$ ). While 19 (29%) of living patients had an infection source, 47 (71%) of dead patients had an infection source and this was statistically significant ( $p = 0.006$ ). The mNutric score ( $p < 0.001$ ) and the presence of infection source ( $p = 0.003$ ) were found as multivariate risk factors effecting intensive care unit mortality.

##### MULTIVARIATE RISK FACTORS

	OR	p	CI
mNutric Score	8,1	<0,001	2–30
Infection Source	7,7	0,003	2,6–25,5

**Conclusions:** In our study, high mNutric score and presence of infection source were found as independent risk factors for predicting the intensive care unit mortality of patients with haematological cancer.

**Disclosure of Interest:** None declared.

#### SUN-PO235

##### PREVALENCE OF CANCER CACHEXIA AND MALNUTRITION IN ONCOLOGY PATIENTS PRIOR TO TREATMENT INITIATION

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**Rationale:** Cancer associated malnutrition/cachexia is a syndrome related with increased morbidity, decreased quality of life and poor survival. In 2018, the Global Leadership Initiative on Malnutrition (GLIM) developed diagnostic criteria for malnutrition. Our aim was to apply and compare the GLIM criteria with the standard international consensus definition criteria (ICDC) as published by Fearon et al. in a sample of newly diagnosed cancer patients.

**Methods:** Patients with locally advanced head and neck tumors or metastatic primaries of any site, referred for induction/first line therapy were eligible. Medical, dietary and weight status history were recorded. Muscle mass was assessed by bioelectrical impedance analysis and was also determined from the Lumbar (L3) skeletal muscle index (SMI) by computed tomography imaging.

**Results:** In total 40 patients (62.5% men) with mean age 73.6 (range, 47–92) were evaluated. According to GLIM criteria 80% were malnourished whereas according to the ICDC 77.5% were categorized as cachectic and 7.5% as precachectic. GLIM criteria detected cachectic patients with 96.8% sensitivity and 77.8% specificity and good strength of agreement (SoA) ( $k=0.776$ ,  $p=0.001$ ) and also detected both precachectic and cachectic patients with 90.9% sensitivity and 71.4% specificity and moderate strength of agreement (SoA) ( $k=0.590$ ,  $p=0.001$ ).

**Conclusions:** New GLIM criteria for malnutrition showed acceptable ability in detecting both cancer cachexia and precachexia in this sample of oncology patients and could be implemented in routine clinical practice for the timely identification of malnutrition/cachexia in cancer patients.

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**Disclosure of Interest:** None declared.

#### SUN-PO236

##### EVALUATION OF MUSCLE MASS LOSS RELATED TO THE TIME OF MECHANICAL VENTILATION, DIAGNOSIS AND AGE. IS THERE A RELATIONSHIP?

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**Rationale:** To evaluate if there is a relationship between loss of muscle mass assessed by quadriceps ultrasound related to factors such as: mechanical ventilation time (MV), diagnosis and age of patients in critical units.

**Methods:** This is a descriptive, retrospective, quantitative and observational study with data collected between June and August 2018 of 5 patients with orotracheal intubation (OTI) (1 female and 4 male), adults and elderly (mean age 68.2 years) hospitalized in ICU of medium complexity of a private hospital in the city of São Paulo/Brazil. The quadriceps thickness measurement was evaluated in 4 moments, the first measurement being measured in up to 48 hours after OTI and the results 3, 7 and 10 days after the initial evaluation. The thickness measurements were measured using Campbell's validated

ultrasound instrument and the measurement of the reference points (1/2 and 2/3 of the iliac crest to the top of the patella) with non-extensible measuring tape. All patients received enteral nutritional therapy, started within 48 hours of OTI. Data were analyzed in Excel spreadsheet.

**Results:** Of the 5 patients, 3 (60%) had a diagnosis related to the respiratory system on arrival at the ICU. The mean OTI time for all patients was 11 days, with elderly patients (mean age 77.3 years) remaining longer on mechanical ventilation (MV) (12.7 days), all of whom progressed to tracheostomy. The analysis of muscle mass loss in the elderly group was also higher, with a mean loss of 38%, being more intense in patients who stayed longer in IOT (loss of 50%), while in young patients, this mean was 10.6%.

**Conclusions:** The findings of this study corroborate with research that shows that the longer the duration of MV, the more intense is catabolism, especially in the elderly population that has greater anabolic resistance. The loss of muscle mass in the elderly population and more exposed to MV demands more attention, mainly, on the adequate protein supply in order to reduce the catabolism improving the outcomes

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**Disclosure of Interest:** None declared.

#### SUN-PO237

##### NUTRIC SCORE X NRS NUTRITIONAL RISK SCREENING. IS THERE DIFFERENCE IN RESULTS IN THE SAME POPULATION?

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**Rationale:** NUTRIC SCORE X NRS 2002 nutritional risk screening. Is there difference in results in the same population?

**Methods:** Descriptive, retrospective, quantitative, and observational study with data from October to November 2018 of 50 patients (29 female and 21 male), adult and elderly (mean age 67 years) admitted to the medium complexity ICU of a private hospital in the city of São Paulo Brazil. For comparison, it was established: low nutritional risk: NUTRIC SCORE  $\leq 4$  points and NRS  $\leq 1$  point; High nutritional risk: NUTRIC  $\geq 5$  points and NRS  $\geq 2$  points. Data were analyzed in Excel spreadsheet and treated statistically.

**Results:** The results of NUTRIC SCORE and NRS 2002 tools applied to 50 patients were compared at the same time. The primary diagnoses involved the nervous (30%) and respiratory systems (20%). The results showed that 23 patients (46%) were classified as low nutritional risk, whereas NUTRIC represented 84% of the patients. In the classification of high nutritional risk, the result was inversely proportional, with NRS high nutritional risk 27 patients (54%) and NUTRIC only 8 patients (16%).

**Conclusions:** The results showed that NRS 2002 screening was more sensitive when compared to NUTRIC SCORE, in this population. This result may be related to the patient profile (low and medium complexity), being the most suitable for this institution, being easier to apply than NUTRIC SCORE. It is important to emphasize that nutritional risk screening, regardless of the tool used, should be applied in order to identify the need for nutritional intervention as early as possible in order to improve the outcomes of critical patients.

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**Disclosure of Interest:** None declared.

## SUN-PO238

### PREVALENCE AND DETERMINANTS OF UNDERNUTRITION IN A SAMPLE OF DUTCH COMMUNITY-DWELLING OLDER ADULTS: RESULTS FROM TWO ONLINE SCREENING TOOLS

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**Rationale:** To increase awareness of undernutrition and to stimulate screening for risk factors (early determinants) and risk of undernutrition (late symptoms) among Dutch community dwelling older adults, a website was developed that includes information about nutrition and healthy ageing and two self-tests. In this study the prevalence and determinants of undernutrition in different age groups of Dutch community dwelling older adults were studied based on these self-tests.

**Methods:** SCREEN II (n=2470) was used to assess nutritional risk factors. This tool consists of 16 items regarding nutritional intake, perception of bodyweight, appetite, oral health and meal preparation. A score <54 (out of 64) indicates nutritional risk. An adjusted SNAQ<sup>65+</sup> (n=687) was used to assess risk of undernutrition. This four-item tool contains questions on weight loss, appetite, walking stairs and BMI. Differences between age-groups (65–74, 75–84, ≥85) were tested by logistic regression.

**Results:** Overall prevalence of nutritional risk factors was 84.1%. Most frequent problems were perception of own weight (62.2%), a low intake of fruit and vegetables (67.5%)/meat(replacements) (55.4%)/dairy products (55.3%), eating meals alone (40.7%), problems with preparing meals (39.5%), or changes in bodyweight (38.7%). Participants aged ≥85 scored significantly worse on almost all items of SCREEN II. An increased risk of undernutrition was seen in 56.8% of older adults, which was higher in age-group ≥85 compared to younger age groups (p < 0.05).

**Conclusions:** A large proportion of older adults reported early determinants for undernutrition, while a smaller, yet remarkable proportion scored positive on undernutrition risk. Online self-screening is a useful, contemporary and easy accessible way to reach older adults who are at nutritional risk. It may contribute to early identification and prevention of undernutrition.

**Disclosure of Interest:** None declared.

## SUN-PO239

### FOUR CLASSICAL MALNUTRITION SCREENING TEST AND ESPEN NEW DIAGNOSTIC CRITERIA OF MALNUTRITION AT HOSPITAL ADMISSION AS PREDICTORS OF LONG-TERM (3 YEARS) SURVIVAL

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**Rationale:** Malnutrition is frequent at admission and increases morbidity and mortality.

**Methods:** We conducted a prospective study at 24 h of hospital admission in order to assess four classical malnutrition screening test performance (mini-nutritional assessment short form (MNA-SF), nutritional risk screening 2002 (NRS2002), malnutrition universal screening tool (MUST), subjective global assessment (SGA)), and ESPEN new diagnostic criteria of malnutrition (being 'at risk' of malnutrition and 1) BMI<18.5 kg/m<sup>2</sup> or 2) weight loss >5% and BMI<20 if <70yo or weight loss >5% and IMC<22 if >70) as predictors of long term (3years) survival.

**Results:** We studied 522 patients (56.4% males, n = 294) with mean age of 61.43 ± 17.62yo, weight 73.89 ± 15.80 kg, height 164.41 ± 9.92 cm, BMI 27.31 ± 5.34 kg/m<sup>2</sup> and recent weight loss 1.24 ± 7.08%. The overall rate of malnutrition was 47.3% and 54.2% in patients >65yo vs 40.7% in patients <65yo (p = 0.002). Specific rates were 29.8, 21.3, 19.5, and 18.8% for MNA-SF, NRS2002, SGA, and MUST respectively. Only 20 subjects (3.8%) were malnourished according to ESPEN criteria. In-hospital mortality was not significantly increased in any test group. However, there was a significantly increased mortality at 3y for undernourished patients detected by any test 24.08% vs 9.06% (p < 0.000) and ESPEN criteria 35% vs 15.37% (p = 0.029). The baseline variables associated to survival at 3-years were: mean age (HR = 1.02 p = 0.001), age >65y (HR = 1.94 p = 0.004), diabetes (HR = 1.76 p = 0.017), lung disease (HR = 2.77 p = 0.001), heart disease (HR = 1.67 p = 0.001), readmissions within 1year (HR 2.77 p < 0.001), recent weight loss >5% and BMI<20 if <70yo or weight loss >5% and IMC<22 if >70 (HR = 5.75 p = 0.003), NRS2002 (HR = 2.20 p < 0.001), SGA (HR = 3.10 p < 0.001) and MUST (HR = 1.72 p = 0.027), any classical test (HR = 2.90 p < 0.001) and ESPEN criteria (HR = 2.60 p = 0.016). In multivariate analysis, SGA (HR = 1.98 p = 0.005) and recent weight loss >5% and BMI<20 if <70yo or weight loss >5% and IMC<22 if >70 (HR = 5.32 p = 0.008) were associated with 3 years survival.

**Conclusions:** Malnutrition at admission is frequent. SGA and recent weight loss combined with low BMI at hospital admission were independently related to 3 years mortality in our cohort.

**Disclosure of Interest:** None declared.

## SUN-PO240

### BODY COMPOSITION CHANGES AFFECT RUNNING PERFORMANCE IN A PROSPECTIVE STUDY

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**Rationale:** A previous cross sectional study demonstrated that running performance is negatively associated with fat mass index (FMI) in both sexes and positively associated with fat-free mass index (FFMI) in women only (1). This study aims to investigate the effect of body composition changes on running performance.

**Methods:** We included runners participating to a yearly timed city run ('Course de l'Escalade'), older than 16 years old, who had ≥2 body composition assessments by bioelectrical impedance analysis at this event between 1999 and 2016. Body composition was calculated by the Geneva formula (2) and converted to FFMI and FMI by dividing fat and fat-free masses by height (m)<sup>2</sup>. Running speed (km/h) was determined, based on running distances (women: 4.8 km; men: 7.2 km) and times. Results are shown as mean ± SD. Multivariate linear mixed regression models, adjusted for categories of age, year of measurement, temperature and relative humidity, evaluated the impact of body mass index (BMI), FMI or FFMI changes on the evolution of running performance.



**Results:** This study included 377 women and 509 men, totalizing 1419 and 2161 body composition measurements, respectively. At baseline, age, BMI and running speed were:  $41.1 \pm 12.2$  yrs,  $22.1 \pm 2.5$  kg/m<sup>2</sup>, 10.9 km/h in women, and  $42.0 \pm 11.9$  yrs,  $24.0 \pm 2.1$  kg/m<sup>2</sup>, 12.9 km/h in men.

**Conclusions:** Evolution of running performance over years is mainly affected by a gain in BMI and FMI in both sexes. Runners who want to maintain or improve their performance should avoid gaining weight and fat mass.

**Table 1**

Multivariate mixed linear regression to evaluate changes in running performance

	Women (n = 377) $\beta$ ; (95%CI), p	Men (n = 509) $\beta$ ; (95%CI), p
BMI (kg/m <sup>2</sup> )	-0.21; (-0.24, -0.17), <0.001	-0.35; (-0.38, -0.31), <0.001
FMI (kg/m <sup>2</sup> )	-0.31; (-0.35, -0.27), <0.001	-0.42; (-0.47, -0.38), <0.001
FFMI (kg/m <sup>2</sup> )	-0.05; (-0.12, 0.02), 0.163	-0.16; (-0.22, -0.10), <0.001

Running performance was negatively associated with an increase of BMI and FMI in both sexes and FFMI in men.

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**Disclosure of Interest:** None declared.

## SUN-PO241

### PREVALENCE OF MALNUTRITION IN HOSPITALIZED CHILDREN AT ADMISSION AND DURING HOSPITALIZATION: A NATIONWIDE MULTICENTER STUDY IN SOUTH KOREA

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**Rationale:** Malnutrition in hospitalized children can have detrimental effects on clinical outcomes and growth, and hospitalized patients are at risk of malnutrition at admission and can be more malnourished during hospitalization. The aim of the study was to investigate the prevalence of malnutrition in hospitalized children at admission and during hospital stay in South Korea.

**Methods:** Nationwide multicenter study was conducted in a total of 872 children (504 boys, 368 girls) admitted to general and tertiary hospitals. The Pediatric Yorkhill Malnutrition Score was used to screen pediatric patients at risk for malnutrition, and weight-for-height and height-for-age z scores were used as indicators for acute and chronic malnutrition.

**Results:** According to the Pediatric Yorkhill Malnutrition Score, pediatric patients at high risks for malnutrition were 299 (34.4%) of 872 children at the time of admission and 262 (30.9%) during hospitalization. At admission, the prevalence of wasting (weight-for-height z score  $\leq 1.0$ ) was 176 (20.3%) and stunting (height-for-age z score  $\leq 1.0$ ) was noted in 151 (17.5%). At admission, 33.4% of pediatric patients admitted at medical departments showed poor oral intake, compared to 15.6% in surgical patients ( $p < 0.001$ ). Pediatric patients showing poor oral intake were significantly higher in the ICU group than in general ward and H-O ward at admission and during hospital stay (both  $P < 0.001$ ). During hospitalization, weight loss was noted in 94 (11.2%).

**Conclusions:** Malnutrition was commonly observed at the time of admission and even during hospitalization in pediatric patients. A significant portion of hospitalized children showed poor oral intake (medical > surgical & ICU > general ward) and weight loss during hospital stay. Therefore, it might be crucial to screen and identify all

children at risk of malnutrition so that nutritional interventions can be initiated in malnourished children.

**Disclosure of Interest:** None declared.

## Nutritional epidemiology I

### SUN-PO242

#### HAND GRIP STRENGTH AND ITS RELATIONSHIP WITH DIETARY INTAKE FROM THE MALAYSIAN HEALTH AND ADOLESCENTS LONGITUDINAL RESEARCH TEAM STUDY (THE MYHEART)

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**Rationale:** The relationship between hand grip strength and dietary intake in adolescents is not well understood. No cohort study investigating the longitudinal relationship of dietary intakes and physical activity on muscles strength among adolescents up to date. Often, these cohort studies were analysed cross-sectionally. Therefore, this will be the first in Asia looks into longitudinal relationship between hand grip strength and dietary intakes (energy and macronutrients).

**Methods:** A cohort study design involved 923 secondary school children who have given consent and participated in 2012 and returned in 2014 and 2016 data collection periods of the MyHeART study. Hand grip strength was measured by using a calibrated JAMAR hand grip dynamometer. Dietary intake was collected using seven-day diet history and was analysed by using the database from Nutrient Composition of Malaysian Food (4th edition) and Nutritionist ProTM software. The analyses were performed separately by gender. Linear regression was used to examine the association between hand grip strength and dietary intake.

**Results:** In this study, dietary intakes changes over the time did not impacts on the hand grip strength for both genders. Although it was not part of the study objectives, it was found that the changes in hand span was found to be associated with hand grip strength for both genders (Male:  $R^2 = 0.389$ ; female:  $R^2 = 0.313$ ). At later age (between 15 and 17-year-old), changes in hand span and % body fat were found to be associated with changes in male's hand grip strength ( $R^2 = 0.326$ ) whereas changes in BMI and hand span were found to be associated with changes in female's hand grip strength ( $R^2 = 0.206$ ).

**Conclusions:** Although there was no relationship found between dietary intakes and hand grip strength, it is important to focus on improve the provision of nutrition strategies for adolescent muscular skeletal health.

**Disclosure of Interest:** None declared.

### SUN-PO243

#### RESULTS OF A SURVEY ON THE QUALITY OF THE BASAL DIET IN HOSPITALIZED PATIENTS AND THEIR RELATIONSHIP WITH THEIR NUTRITIONAL STATUS

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**Rationale:** One of the indicators of quality of the diet offered to hospitalized patients is conducting a survey of the patients themselves. The answers can be influenced by multiple factors. We explore the influence of the patient's nutritional status on some of the responses.

**Methods:** A satisfaction survey of the diet is offered to hospitalized patients who are on a regular diet. These patients are selected because it is a non-therapeutic diet and therefore its quality does not depend on the underlying pathology. General assessment, presentation, variety, quantity and temperature are requested. In addition, nutritional assessment was performed with MNA-SF, calf circumference, triceps skinfold, arm circumference, weight loss, hand strength and bioelectrical impedance. Chi square and ANOVA are assessed. Informed consent is requested.

**Results:** 1) Of the 654 hospitalized patients, 132 patients (20.18%) (57.6% men, mean age 66.9 +15 years) were on a regular diet. 56.8% are from medical areas and 43.2% from surgical areas. The average number of days admitted was 10.93 ± 12.9. 2) The good or very good valuation in general is 71.4%, presentation 85.7%, variety 81.7%, temperature 84%, but consider that the amount was too much 50%. 3) They recognize that 35.4% eat half or less of the ration and according to MNA-SF, 2.4% are malnourished and 29.7% are at risk of malnutrition. 4) Patients who reported that the quantity offered was too much, 40.8% are at risk of malnutrition and 5.3% are malnourished. 5) Comparison between those who consider that the amount of food is too much compared to those who consider it adequate, those who report that it is too much are older ( $p: 0.0001$ ), lower calf circumference ( $p: 0.01$ ), worse score in MNA ( $p: 0.01$ ) and lower strength of the hand ( $p: 0.0001$ ). 6) The muscle mass measured by bioimpedance was lower in the group that considered that the quantity of the food offered was too much but without statistical significance.

**Conclusions:** The regular diet is well considered in the hospital and a high percentage of hospitalized patients consider that the quantity offered is excessive, but they are the oldest and worst nourished so it should not consider reducing the food rations offered.

**Disclosure of Interest:** None declared.

#### SUN-PO244

##### SERUM LEPTIN LEVELS IN HEALTHY VEGETARIAN AND MEAT-EATING WOMEN

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**Rationale:** Appropriately planned vegetarian diet is not only considered as nutritionally adequate, but also healthful – its positive role in prevention and treatment of overweight and obesity has been proven widely. Leptin, hormone secreted from the adipose tissue, regulates appetite and is deeply involved in the maintenance of energetic homeostasis – too high levels of the adipokine result in excessive body fat. Leptin concentrations correlate positively with the number and size of the adipocytes, but certain diet components presumably also play a role. It is well established that people whose diet is meat-free have lower BMI and body fat. In this study we aimed to evaluate serum leptin concentrations in healthy lacto-ovo-vegetarians, vegans and control subjects with normal BMI.

**Methods:** Leptin levels were investigated in 105 female volunteers – 39 vegans, 42 lacto-ovo-vegetarians and 24 omnivores. All women had – on average – the same BMI, and WHR. For examination of serum leptin levels immunoenzymatic test (ELISA) was used. Calculations were made in Statistica 12 (Statsoft). Serum leptin concentrations were compared using Kruskal-Wallis test.

**Results:** Statistically significant differences in medians have been observed between omnivores and both plant-based diet groups – meat-eating subjects had higher serum levels of the hormone ( $H = 13.22, p = 0.001$ ).

**Conclusions:** These results show benefits from adopting diets excluding meat. The further step of the study encompasses analysis of 24-h diet recalls and dietary records made by participants, in order to identify potential diet factors responsible for observed differences in leptin levels.

**Disclosure of Interest:** None declared.

#### SUN-PO245

##### CROATIAN NUTRITIONAL SCREENING OF COPD PATIENTS

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**Rationale:** The aim of this study was nutritional screening of COPD patients as well as their demographic characteristics. We have evaluated relationship between body mass index (BMI), pulmonary function results, six minute walk test (6MWT) and Bioelectrical impedance analysis (BIA) variables – fat free mass (FFM), sarcopenic indices (SI), phase angle (PA) and fat free mass index (FFMI).

**Methods:** This was a population-based epidemiologic study conducted in three Croatian cities. The study sample included COPD patients. Weight and body composition were measured barefoot in lightweight indoor clothing; PA, SI, FFM were determined using a BIA. **Results:** We have analysed data of 151 COPD patients, 93 male (61.6%) and 58 female (38.4%), mean ± SD baseline age 65.68 ± 8.5. Mean ± SD percentage of FEV<sub>1</sub>, men vs women, was 50.5% ± 20.41 vs 59.56% ± 24.91. Mean ± SD 6MWT, men vs women, was 383.6 ± 113.5 m vs 399 ± 107.4 m. Mean ± SD BMI was 26.64 ± 5.508 kg/m<sup>2</sup>, mean ± SD FFM, men vs women, was 63.62 ± 10.53 kg vs 46.91 ± 8.22 kg, mean ± SD PA, men vs women, was 5.89 ± 1.52 vs 5.88 ± 1.96 and mean ± SD for FFMI, men vs women, was 20.87 kg/m<sup>2</sup> ± 3.043 vs 17.85 kg/m<sup>2</sup> ± 3.103. Mean SI for both man and woman was 7.77 ± 1.428. Further analysis showed no significant correlation of BMI with FEV<sub>1</sub> ( $r = 0.066, p = 0.427$ ) but it showed significant negative correlation with 6MWT ( $r = -0.186, p = 0.023$ ). FFMI showed no significant correlation with FEV<sub>1</sub> ( $r = 0.132, p = 0.112$ ) and 6MWT ( $r = -0.083, p = 0.311$ ). There was also no significant correlation between PA and SI with FEV<sub>1</sub> ( $r = 0.103, p = 0.217, r = 0.121, p = 0.147$ ) and with 6MWT ( $r = -0.003, p = 0.967, r = -0.103, p = 0.21$ ).

**Conclusions:** We have presented first evaluation of nutritional status on national level of COPD patients in Croatia. These preliminary results point towards the importance of an interdisciplinary approach while assessing COPD patients. Including more patients of various nutritional status is necessary to confirm these findings.

**Disclosure of Interest:** None declared.

**SUN-PO246****PREVALENCES OF BULIMIA NERVOSA AND BINGE EATING DISORDER AMONG A SAMPLE OF LEBANESE CHILDREN AND YOUNG ADOLESCENTS**

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**Rationale:** Childhood and adolescence are critical periods of neural development and physical growth. Malnutrition and other complications resulting from eating disorders (ED) may have severe consequences on health. The objective of our study was to examine the prevalences of bulimia nervosa (BN) and binge eating disorder (BED) among children and young adolescents in several Lebanese schools.

**Methods:** Our study was conducted on a convenience sample of 253 students (54.5% males and 45.5% females), aged between 8 and 13 years, recruited from private Lebanese schools between February and June 2018. Every student was interviewed to collect information about sociodemographic factors and health characteristics. The DSM-5 criteria were used to examine the prevalences of BN and BED.

**Results:** The prevalences of BN and BED were 1.18% and 4.74% respectively. The prevalences of overweight and obesity were 13.83% and 10.67% respectively. Around 55.3% of the participants bought fast food more than 3 times/week from school cafeterias. Almost the third (32.06%) of students spent between 2 and 5 hours/day in front of a digital device.

**Conclusions:** Many children and young adolescents suffer from ED that can lead to serious future health problems.

**Disclosure of Interest:** None declared.

**SUN-PO247****CHILDHOOD OBESITY RISK AND ITS ASSOCIATION WITH EATING AWAY-FROM-HOME**

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**Rationale:** Considered the epidemic of the XXI century, childhood obesity, is a serious public health problem. Among other biological and behavioural factors, paediatric obesity has become increasingly related to eating away-from-home. This study examined the association between childhood obesity, children's meals and eating out in three types of restaurants (traditional Portuguese food restaurant, fast food restaurant and snack bar).

**Methods:** A representative sample of Portuguese children (5706 boys and 5950 girls aged 6–11 years) was used for this analysis and an ethnographic study with 233 interviews of the owners of snack bars in a Portuguese city (Coimbra). Weight and height were measured, and the body mass index was consequently calculated; the obesity was defined using the *International Obesity Task Force* cut-offs. A questionnaire was filled out by their parents to survey on their family characteristics and the children's nutritional behaviours. Logistic regression analyses were performed, adjusted for age, the fathers' and mothers' levels of education and obesity of the fathers and mothers.

**Results:** Overweight/obesity values were higher in children whose father or mother is obese than in children whose parents are not overweight/obese. Findings revealed a statistically significant

association between obesity and eating out at snack bars in boys (Odds Ratio = 1.21; 95% Confidence Interval = 1.03–1.43; p = 0.03).

**Conclusions:** The present study shows that eating out at snack bars may be a risk for children's health because those who eat out at these food establishments have a 21% higher risk of being obese than those peers who do not eat out at snack bars. The results indicate the need for designing public health strategies directed toward this type of food establishment with the purpose of providing healthier meals.

**Disclosure of Interest:** None declared.

**SUN-PO250****IMPLEMENTING AND PILOT TESTING OF A CUSTOMIZED INTERVENTION TO INCREASE PHYSICAL ACTIVITY AND HEALTHY EATING AMONG PRESCHOOL CHILDREN: A RANDOMIZED CONTROLLED TRIAL**

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**Rationale:** The World Health Organization has introduced non-communicable diseases (NCDs) as the major health challenge in 21st century and emphasizes the need for urgent action to prevent and control NCDs. The main objective of this study was to customize and implement a multi-level multi-component intervention program and to evaluate its effects on nutrition- and physical activity-related outcomes in preschool children.

**Methods:** In a pilot randomized controlled trial, 202 preschool aged children (4–6 years) in four cluster randomized preschools from high and middle socioeconomic levels in Mashhad, Iran, were enrolled and entered into two groups of intervention and control. A customized intervention program, consisting of six interlinked components (resources for children, implementation guide, training and monitoring, parent engagement, building partnership, communication and knowledge exchange) was conducted in the intervention group for five months. Quality of life, anthropometric indices, nutrition risk, healthy eating index, subjective and objective physical activity level and children attraction to physical activity, as well as feasibility of the intervention program were evaluated.

**Results:** A total of 193 children (95 in intervention and 98 in control group) remained for analysis. The BMI z-score increased in underweight children (ANCOVA, p = 0.01), and remained unchanged in overweight children of intervention group compared to control group (ANCOVA, p = 0.84). Nutrition risk score insignificantly decreased among intervention group (Paired T-test, p = 0.72) and increased among control group (Paired T-test, p = 0.29), and was not significant in between-group analysis (ANCOVA, p = 0.43), while healthy eating index significantly increased in underweight (ANCOVA, p = 0.04). Objective physical activity level increased significantly in physical activity level among intervention group (ANCOVA, p < 0.001). No improvements were detected in quality of life.

**Conclusions:** This program is feasible and effective in promotion of healthy eating and physical activity among preschool children in a nutrition transition context. Further surveys with qualitative approaches as well as studies with longer intervention and short-term and long-term follow-up period is highly recommended.

**Disclosure of Interest:** None declared.



**SUN-PO251**  
**HOW THE NUTRITIONAL RISK IN HOSPITALIZED PATIENTS DETERMINES THE CUSTOMIZATION DIET AND LENGTH OF STAY: A RETROSPECTIVE STUDY**

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**Rationale:** Malnutrition is common in hospitalized patients as a cause and/or consequence of disease. It is associated with morbidity and mortality, length of stay, and associated health costs. The prevalence still high, 20–50%, depending on assessment criteria, malnutrition definition, and screening tools used. Hospitalized patients should be screened for nutritional risk and according to the ESPEN recommendations the NRS-2002 must be used in all hospitalized patients. Our aim was to compare the nutritional risk at the beginning and end of hospitalization period (discharge or death); compare NRS-2002 initial score with underlying disease, length of stay, proposed diet and clinical outcome; correlate NRS-2002 score at the moment of discharge with length of stay and proposed diet.

**Methods:** Observational retrospective analytic study. Included hospitalized patients from every ward in Garcia de Orta Hospital (except ICU, pediatrics and pregnant patients), age ≥ 18 years and admitted during 2018

**Results:** 2838 patients, 1525 male, age 65.7 ± 17.2 years [18–101] and length of stay 16.9 ± 18.9 days [1–278]. Causes to hospitalizations: cancer, pneumonia, stroke and decompensated heart failure. Proposed diet at admission: general meal (28%) and modified soft meal (14%). Proposed diet at discharge: customization diet (39%) and EN/PN (26.6%). For initial scores ≥ 3 (1413 patients) we found a positive, statistically significant correlation with customization of diet during hospitalization and length of stay until the moment of death (p < 0.01).

**Conclusions:** NRS 2002 assessment upon hospital admission is fundamental for early identification of nutritional risk, with implications in length of stay and clinical outcome, allowing for appropriate nutritional support with diet customization, decreasing hospital stay and improving nutritional status and clinical outcome.

**Disclosure of Interest:** None declared.

**SUN-PO252**  
**HEALTH AND NUTRITIONAL MANAGEMENT IN THE UNEXPECTED DISASTER THROUGH THE CONCEPT OF NST**

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**Rationale:** A small town, where the author lives, was hit by the debris flow disaster caused by a local heavy rainfall in the summer of 2018. Fortunately, there was no personal injury such as death or missing, but the residential area was surrounded by much amount of mud and isolated from the near towns for 6 days. As the town's Vice Mayor, I had to manage the health of the residents with removing soil and so on.

**Methods:** Using the concept of NST, we decided role allotment according to occupation of the residents. As for, medical care workers managed nutrition and support to the elderly. City office workers responded to government administration, teachers responded to the children, civil engineers worked to remove soil, etc. After that, we carried out a questionnaire to the residents and conducted an interview survey about their diet and health condition.

**Results:** Responses were obtained from 54 people in 17 households. 20 males and 34 females, with an average age of 46.3 years old. About nutrition, 70% answered 'Yes' for cooking. In addition, 76% answered

'Yes' as to whether they have consumed a sufficient amount of food. About the contents of meals, 41% of retorts and frozen foods, 18% of lunch boxes, 13% of instant foods, 15% of not having much appetite and not eating very much, and 13% of people who had regular meals. Nutritionally, it was rich in carbohydrates, and only 30% of people could eat vegetables and meat each. On health, there were no direct effects (such as injuries) from the disaster, but there were many mental stresses such as anxiety and sleeplessness, and back pain due to work without heavy equipment.

**Conclusions:** In the disaster site, the concept of 'multi-professional nutritional assessment, nutritional management plan, implementation, re-planning' cultivated by NST activities should be 'conduct assessment, health and living environment improvement planning, implementation, by carrying out the 'plan' flow. It was very useful for keeping the government's response in a small but isolated situation without causing a major accident or illness. At any disaster sites, it is important to share information and unify policies regardless of the scale.

**Disclosure of Interest:** None declared.

**SUN-PO253**  
**EAT TO DEATH – FEEDING THE PATIENT AT THE END OF LIFE – A HOLOCAUST PERSPECTIVE**

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**Rationale:** The issue of artificial feeding at the end of life is complex and sensitive. The Dying Patient Act, Israel 2005 established the legal arrangement on this issue, however the dilemmas of how to treat the feeding of the dying patient, still preoccupies doctors, nurses, dietitians, social workers as well as patients and their families. The question arises whether the Dying Patient Act in Israel was influenced by the Holocaust, and whether the difficulty of caregivers in the field is based on the national memory of the Holocaust.

**Methods:** In this presentation, I will address the physiologically and nutritionally relevant information and clarify the provisions of the law on the subject of feeding at the end of life and the rationale behind it, while addressing similar aspects and dilemmas during the Holocaust.

**Results:** The ethical approach to this issue in Israel is highly influenced by the Holocaust memory of starvation and consequence death. The famous images of malnourished survivors after the war is almost genetically imprinted in the Jewish memory. Together with Jewish perspectives on end-of-life care, feeding at the end of life becomes a major dilemma in Israel.

**Conclusions:** While Jewish tradition maintains that human life is of infinite value and that its preservation and extension overrides every other religious imperative, relieving pain and allowing for the soul's peaceful departure are also values well-established in Jewish tradition. Of course, there is a moral distinction between hastening death and removing obstacles to its natural progression, but in practice, the difference is not always easy to discern. Artificial feeding is a treatment designed to provide the patient with the basic needs of food and fluids, which without it is impossible to exist, and as such, preserves life as long as it lasts naturally. Nevertheless, providing these needs through feeding tubes is perceived as an artificial means of prolonging life and some see it as a medical treatment like any other treatment. Most Orthodox authorities generally consider nutrition and hydration, even if artificially provided by a feeding tube, to constitute essential human needs that should never be discontinued as long as they are effective.

**Disclosure of Interest:** None declared.

**SUN-PO254**  
**SWISSHPN-II STUDY: LONG TERM CHALLENGES AND**  
**COMPLICATIONS HOME PARENTERAL NUTRITION**

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**Rationale:** The incidence of home parenteral nutrition (HPN) for adults in Switzerland is about 4 per 1 million inhabitants per year<sup>1</sup>. Although necessary, no representative national registry exists to date to compare and evaluate HPN treatments with other countries and healthcare systems. The prospective SwissHPN-II study implements a first study from 2013/2014<sup>1</sup>.

The study aimed to characterize adult Swiss HPN-patients, their underlying diseases, HPN indications and complications, and living conditions. This preliminary study evaluation after two years focused on PN catheters-related complications and PN regimens used.

**Methods:** Data from a structured questionnaire filled every 6 months over two years by the patient and the treating physician of 70 HPN-patients (50% women) were analyzed.

**Results:** The proportion of central venous accesses were: Hickmann (54%), Port-a-Cath (29%), and PICC (17%). Except two, all patients were infused with commercial multi-chamber all-in-one PN admixtures. Most patients (56%) manage HPN administration themselves or with help of family members. Most prevalent underlying diseases are cancer (30%), bariatric surgery (11%), and Crohn's disease (10%). Mechanical and infectious catheter-related complications were experienced by 66% and 36% of the patients, respectively. Catheter thrombosis occurred in 14% of the patients.

**Conclusions:** The larger HPN-patient number compared to SwissHPN-I (+112%) gives a representative picture of the adult Swiss HPN cohort. Oncologic patients account for only one third. Mechanical complications affected every third patients while infectious complications were seen in two thirds of the patients. Venous thrombosis occurred in every sixth patient. More comprehensive data will be presented after completion of the data analysis.

**Reference**

1. Aeberhard C *et al. Ann Nutr Metab* 2015; 67: 210–217.

**Disclosure of Interest:** None declared.

**SUN-PO255**  
**IMPORTANCE OF SMI AS A PARAMETER OF MUSCLE MASS IN**  
**PATIENTS WITH CKD**

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**Rationale:** Chronic kidney disease produces changes in the skeletal muscle that can lead to sarcopenia, which increases in advanced ages. It is difficult to agree on the method of assessing the loss of muscle mass and SMI appears by BIA as a muscle marker.

**Methods:** We studied 200 patients with CKD, 74 with ERCA in one center and 125 with HD in 2 different units. 71.9% men, total age 71.5 ± 12.3 years.

We evaluated the skeletal SMI value by bioimpedance and correlated it with strength, muscle, fat mass, lean mass and total muscle and segmental by INDHODY S10 multifrequency bioimpedance as well as visceral proteins, PCR, Hb and muscle strength by Hand grip strength.

**Results:** xSMI in the patients analyzed was 7.39 ± 1.19 in men and 6.54 ± 3.90 in women. xSMI ACKD 7.64 ± 3.46 and in HD 6.86 ± 1.15 (p0.023).

We found significant direct correlation in men between SMI and left dynamometry (0.02), right (0.08), lean mass in arms and legs (0.000), skeletal muscle (0.000), BMI (0.000), inverse with age (0.000). Not significant with albumin, prealbumin, PCR and B2microglobulin, MIS, VGS or Hb, ratio ECW/TBWA in arms.

We found significant direct correlation in women between SMI and skeletal muscle mass, lean mass in arms and BMI (0.000), inverse with age, rest of non-significant parameters.

Analyzing according to the ERCA and HD groups, we observed the same result in ACKD as in the global group of women, with a significant direct correlation between SMI between right and left (0.000) and indirect MIS (0.000).

**Conclusions:**

1. SMI appears as a good marker of both overall and segmental muscle mass.
2. It correlates with parameters of skeletal muscle mass and muscle strength.
3. There are differences between the group of Advanced CKD and HD as well as between men and women

**Disclosure of Interest:** G. Barril Speakers Bureau of: ABBOT, Nutricia, Viphor Fresenius, A. Nogueira: None declared, G. Alvarez: None declared, B. Santos: None declared, J. A. Schez Tometo: None declared.

**SUN-PO256**  
**PREVALENCE OF NUTRITION-RELATED ORAL HEALTH PROBLEMS IN**  
**THE DENTAL CARE PRACTICE**

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**Rationale:** In this cross-sectional study, we aimed to evaluate the prevalence of nutrition-related oral health problems (NR-OHP) in general dental care practice. Oral health problems related to nutritional intake is a risk for chronic diseases like obesity, heart disease, cancer and diabetes. Also, dietary imbalance is a risk factor for tooth decay and periodontal diseases. Collaboration between dietitians and dentists may improve quality of care for patients with NR-OHP. Nutritional assessment and diet treatment is essential in case of noncompliance, readmission or comorbidities. Knowledge about the prevalence of NR-OHP in dental care practice is the first step to collaborate in nutritional and dental care.

**Methods:** All 1181 visitors (aged 42.4 ± 21.1 years) of the general dental care practice Stichting Tandartsen Centrum Deventer, The Netherlands, were screened on six NR-OHP from November 19 to 30 November 2018. Ten dentists performed clinical examination using a checklist developed by the researchers following DPSI criteria. Before data collection, the dentists were educated how to use this checklist. Data collected were age, active dental caries, tooth erosion, gingivitis, periodontitis, oral ulcers and xerostomia.

**Results:** According to the diagnostic criteria of six NR-OHP, 75.7% of the visitors were classified with NR-OHP and 24.3% did not have an oral health problem. 49.3% of all visitors had gingivitis, 23.4% active dental caries and 18.8% periodontitis. Xerostomia, tooth erosion and oral ulcers had a prevalence of 3.7, 3.2 and 0.9%. 54.1% had one of the six NR-OHP, 19.6% had two and 1.9% multiple problems.

**Conclusions:** Three-quarter of dental care practice visitors have NR-OHP and one out of five visitors have multiple OHP related to dietary intake. Gingivitis, dental caries and periodontitis are the most common oral health problems that may need nutritional care next to dental care.

**Disclosure of Interest:** None declared.

**SUN-PO257**  
**DIETARY PROTEIN INTAKE AND HAND GRIP STRENGTH AMONG ADOLESCENTS: FINDING FROM MALAYSIAN HEALTH AND ADOLESCENTS LONGITUDINAL RESEARCH TEAM STUDY (MYHEART)**

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**Rationale:** Efforts to understand the dietary especially protein influence hand grip strength in adolescents could help develop early strategies to prevent adverse health-related outcomes such as cardiovascular diseases. Therefore, this study attempt to examine the high biological value protein intake and hand grip strength among adolescent.

**Methods:** The data was analysed cross-sectionally based on 973 adolescents, aged 17-year-old on-going secondary schooler (male = 333; female = 640) who have participated in the MyHeART. The details of the protocol of the study was published previously (1). Hand grip strength was measured with calibrated JAMAR hand dynamometer. Dietary intake was collected using seven-day diet history and was analysed by using the database from Nutrient Composition of Malaysian Food (4th edition) and Nutritionist ProTM software. The analyses were performed separately by gender. Hand grip strength was categorised into tertile and ANOVA was used to examine the association between hand grip strength and dietary protein intake.

**Results:** Male in all tertiles consumed approximately 55% of high biological value protein (T1:37 g; T2:41 g; T3:40 g). Similar finding was found for female (T1:32 g; T2:34 g; T3:33 g).

**Conclusions:** This study suggest no relationship between high biological value protein intake and hand grip strength for both gender.

**Reference**

1. Hazreen MA, Su TT, Jalaludin MY, Dahlui M, Chinna K, Ismail M, et al. An exploratory study on risk factors for chronic non-communicable diseases among adolescents in Malaysia: overview of the Malaysian Health and Adolescents Longitudinal Research Team study (The MyHeART study). *BMC Public Health*. 2014;14 Suppl 3:S6.

**Disclosure of Interest:** None declared.

**SUN-PO258**  
**THE EFFECT OF WOLFFIA GLOBOSA DUCKWEED, A GREEN AQUATIC PLANT, ON POSTPRANDIAL GLYCEMIC RESPONSE; A RANDOMIZED CROSSOVER CONTROLLED TRIAL**

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**Rationale:** We aimed to compare the postprandial and overnight glycemic response using a novel green aquatic plant thought to provide a dietary source for high-quality protein, with a dairy shake.

**Methods:** This is a randomized controlled crossover trial among twenty abdominally-obese participants (age = 51.4 years; fasting-plasma-glucose = 110.9 mg/dL), who were allocated to replace dinner with either, first, a green shake containing *Wolffia globosa* duckweed (*Mankai:specific-strain*), or an iso-carbohydrate/protein/calorie yogurt shake. A two-week flash-glucose-monitoring-system was used to assess post-meal glucose dynamics. We further obtained from each participant dietary/daily-activity/satiety-scale/sleep logs.

**Results:** *Wolffia globosa* elicited a lower postprandial glucose peak compared to yogurt ( $\Delta$ peak = 13.4 mg/dL vs. 19.3 mg/dL;  $p = 0.044$ ), which occurred later (77.5 min vs. 59.2 min;  $p = 0.037$ ) and returned faster to baseline glucose levels ( $135.8 \pm 53.1$  min vs.  $197.5 \pm 70.2$  min;  $p = 0.012$ ). The mean post net-incremental-area-under-the glucose curve (netAUC) was lower with *Wolffia globosa* up to 60 and 180 minutes (netAUC60min:  $185.1 \pm 340.1$  mg/dL\*min vs.  $441.4 \pm 336.5$  mg/dL\*min;  $p = 0.005$ ; netAUC180min:  $707.9 \pm 1428.5$  mg/dL\*min vs.  $1576.6 \pm 1810.1$  mg/dL\*min;  $p = 0.037$ ). *Wolffia globosa* based shake replacing dinner resulted in lower next-morning fasting glucose levels ( $83.2 \pm 0.8$  mg/dL vs.  $86.6 \pm 13$  mg/dL;  $p = 0.041$ ). Overall, postprandial glucose levels from the shake administration until the next morning were lower in the *Wolffia globosa* green shake compared to the yogurt shake ( $p < 0.001$ ).

**Conclusions:** *Wolffia globosa* duckweed, naturally rich in dietary fibers and polyphenols, may serve as an emerging alternative plant protein source with potential beneficial postprandial glycemic effects.

**Disclosure of Interest:** None declared.

**SUN-PO259**  
**PREVALENCE OF THE SARCOPENIA AMONG UNDERNOURISHED PATIENTS WITH CACHEXIA AND DISEASE-RELATED MALNUTRITION**

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**Rationale:** Estimate of the sarcopenia prevalence among patients with cachexia and disease-related malnutrition

**Methods:** 64 patients (30 men, 34 women) with undernutrition (BMI less than  $18.5 \text{ kg/m}^2$ ) held the treating in 2012–2018 were included into retrospective analyze. Sarcopenia was identified by criteria suggested G. Biolo et al. (2014): fat-free mass index (FFMI) less than  $17 \text{ kg/m}^2$  for men and FFMI less than  $15 \text{ kg/m}^2$  for women. Bioelectrical impedance analysis (BIA) and dual energy X-ray absorptiometry (DXA) were used for FFMI evaluating. Cachexia was determined in patients with systemic inflammation (C-reactive protein etc.) and body mass index (BMI) less than  $17 \text{ kg/m}^2$  and weight loss greater than 10%, in patients with BMI between 17 and  $18.5 \text{ kg/m}^2$ , precachexia established.

**Results:** It has been found that FFMI in the patients with cachexia and precachexia with inflammation (cancer, Crohn's disease, ulcerative colitis, sepsis etc.) were  $13.96 \pm 1.4 \text{ kg/m}^2$ , particularly  $13.5 \pm 0.47 \text{ kg/m}^2$  in 12 women and  $14.3 \pm 0.49 \text{ kg/m}^2$  in 10 men. Sarcopenia was found at all of 22 patients with cachexia and precachexia (100%). At 42 patients with chronic and acute disease-related malnutrition (without inflammation) FFMI were  $13.7 \pm 0.4 \text{ kg/m}^2$ , particularly  $13.7 \pm 0.46 \text{ kg/m}^2$  in 23 women and  $13.7 \pm 1.2 \text{ kg/m}^2$  in 19 men. In patients with malnutrition (without inflammation) sarcopenia had been observed in 30 persons (71%). Significant differences in FFMI were found between patients with sarcopenia but without inflammation (FFMI was  $12.68 \pm 0.49 \text{ kg/m}^2$ ) and patients with sarcopenia combined with cachexia ( $P < 0.05$ ).

**Conclusions:** Sarcopenia is observed at all of patients with cachexia and precachexia. Among patients with undernutrition without inflammation the sarcopenia was observed at 71% of them.

**Reference**

1. Biolo G., Cederholm T., Muscaritoli M. Muscle contractile and metabolic dysfunction is a common feature of sarcopenia of aging and chronic diseases: from sarcopenic obesity to cachexia. *Clin. Nutr.* 2014; 33 (5): 737–748.

**Disclosure of Interest:** None declared.



## Nutritional techniques and formulations I

### SUN-PO260

#### CENTRAL VENOUS CATHETERS INFECTIONS RELATED TO PARENTERAL NUTRITION PROVISION

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**Rationale:** Infections are one of the most common complications of central venous catheters (CVC) used to provide parenteral nutrition.

**Methods:** We review all CVC used for parenteral nutrition supply in our Hospital during 2014 and 2018 in order to compare the causes of CVC removal, the rate of blood culture and catheter tip culture requested, the frequency of CVC infections (defined as positive blood and/or catheter tip cultures), the pathogenic microorganisms involved in case of infection and the duration of parenteral nutrition. Moreover, we look for factors conditioning a higher risk of CVC infection.

**Results:** We analyzed 332 CVC used for parenteral nutrition in 2014 and 248 used in 2018. There were no significant differences on patients' baseline characteristics among 2014 and 2018, except for nutritional status: rate of malnutrition was higher in 2014 (91.6% vs 79.0%;  $p < 0.001$ ). Mean duration of parenteral nutrition was 11 (IQR 93) days on 2014 and 10 (IQR 136) days on 2018 ( $p = 0,049$ ).

In 2014, the proportion of CVC removed because of the presence of fever was higher than in 2018 (21.8% vs 18.6%), and also the rate of catheter tip cultures requested (40.7% vs 20.85;  $p < 0.001$ ).

Confirmed Infection related to CVC used for parenteral nutrition supply was more prevalent in 2014 than in 2018 (34.0% vs 20.6%;  $p < 0.001$ ). Incidence rate of CVC infection decreased from 21.6/1000 days of parenteral nutrition (CI95% 17.8–25.9) in 2014 to 13.9/1000 days of parenteral nutrition (CI95% 10.4–18.4) in 2018 [RR 1.54 (CI95% 1.10–2.19);  $p = 0.009$ ].

On multivariate analysis, we did not find any factor that might increase the risk of CVC infections.

**Conclusions:** The prevalence of CVC infections related to parenteral nutrition in our Hospital is high although it has decreased in the last 4 years, as it happens with the incidence rate of CVC infections.

**Disclosure of Interest:** None declared.

### SUN-PO261

#### MACHINE LEARNING MODEL PERFORMANCE IN PRESCRIPTION OF NUTRITION Therapy

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**Rationale:** A machine learning model (MLM) was created, tested for caloric & protein prescription

Models of Machine Learning (ML) and Artificial Intelligence have their increasing application in several specialties of health care. Nutritional Therapy is a field of potential application of the methodology.

Investigations in the area are still scarce

Machine learning model was created & tested for caloric & protein prescription

**Methods:** A nutritional therapy specialist performed simulations of caloric and protein targeting for 100 clinical scenarios created from the random combination of the following variables: Age, Weight, Height,

Glycemia, Creatinine, PCR-T, Chance of evolution for dialysis. A neural network residing on a cloud platform computing (Amazon Web Services (R)) was fed with this data, in steps of 10 simulations to the 100 entries. At each step, a new ML model was created, pushing against the increasing number of

Appetizer. The model created was tested in the scenarios proposed to the examiner. The accuracy of both models was compared by means of the mean square error. The performance was considered better in favor of the minor mean square error.

Specialist made simulations of cal & prot goals for scenarios created by Age, Wt, Ht, Glyc, Creat, CRP, dialysis chance. A neural network was trained in steps of 10, total = 100, and new ML models were created. Performance was compared with specialist by mean square root error.

A specialist performed simulations for CAL and PROT in 100 clinical scenarios randomly created (Age, Wt, Ht, Glycemia, Creatinine, CRP, dialysis). A neural network was trained in steps of 10. New MLM were generated and compared to specialists's by mean square root error.

#### Results:

	C20	C40	C60	C80	C100	P20	P40	P60	P80	P100
MOD	5.32	FAIL	6.44	4.83	6.37	0.59	0.79	0.597	0.357	0.39
spec	6.21		7.63	5.80	7.61	0.43	0.45	0.41	0.39	0.31
DIF	0.90		1.19	0.97	1.25	0.16	0.34	0.18	0.05	0.08
Res	y		y	y	y	n	N	N	y	N

**Conclusions:** ML returned prescriptions with lower MSQE than those provided by experts

**Disclosure of Interest:** None declared.

### SUN-PO262

#### SENSITIVITY OF DIFFERENTIAL TIME TO POSITIVITY COMPARED TO POUR PLATES FOR DIAGNOSING CATHETER-RELATED BLOOD STREAM INFECTION: AN EVALUATION IN PATIENTS WITH CHRONIC INTESTINAL FAILURE

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**Rationale:** Clinical findings are unreliable for establishing the diagnosis of central venous catheter-related bloodstream infection (CRBSI) because of their poor sensitivity and specificity. Therefore, in order to establish a diagnosis of CRBSI, when this is clinically suspected and the central venous catheter (CVC) is to be preserved, ESPEN recommend that paired quantitative blood cultures (pour plates) or paired qualitative blood cultures from a peripheral vein and from the catheter are recommended, with continuous monitoring of the differential time to positivity (DTP). However, it is unclear whether quantitative or qualitative cultures provide the optimal method for diagnosing CRBSI in patients with intestinal failure (IF). A retrospective evaluation was undertaken in intestinal failure patients with long term CVCs to evaluate DTP against pour plates for the diagnosis of CRBSI.

**Methods:** A list of patients with a diagnosis of CRBSI was obtained from the intestinal failure (IF) unit database for a five year period, 2013 to 2017. Microbiology records were reviewed to obtain further information about blood culture and pour plate examinations. Organisms and times of collection, loading and positivity were recorded. Patients with a contemporaneous set of central and peripheral pour plates and blood cultures were included in an analysis of the sensitivity of DTP compared to pour plates.

**Results:** There were 61 (45.5%) episodes in 56 patients where complete sets of central and peripheral blood cultures and pour plates were received. All 61 episodes had positive central blood cultures, 59 (96.7%) had positive central line pour plates and 17 (27.9%) had positive peripheral pour plates. Using pour plates as the gold standard, DTP sensitivity was 96.0% for 50 episodes where pour plates were consistent with CRBSI. The sensitivity increased to 100% for 17 episodes where there were no delays in either collection or loading of blood cultures.

**Conclusions:** This is the first evaluation to support the use of DTP as a sensitive test in diagnosing CRBSI in IF patients and provides confidence to IF centres where pour plate cultures are not available. DTP can be used as a primary diagnostic test for CRBSI in patients with IF; however, in order for this to be of maximum value to clinicians, time to positivity needs to be routinely reported with blood culture results.

**Disclosure of Interest:** None declared.

#### SUN-PO263

##### ARE FEMORAL TUNNELLED CENTRAL VENOUS CATHETERS SAFE TO USE FOR HPN?

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**Rationale:** Patients with Intestinal Failure (IF) require reliable intravenous access for the provision of Parenteral Nutrition. Venous access for Home Parenteral Nutrition (HPN) patients with Type 3 IF can be compromised due to thrombosis of deep veins. The preferred choice of veins for central venous catheter are the supra cardiac veins. Femoral tunnelled CVC are avoided due to concerns of catheter-related bloodstream infection (CRBSI) and are considered as a last resort when all other thoracic CVC access is exhausted. We assess the outcomes of tunnelled femoral catheters in our cohort of HPN patients.

**Methods:** We did a retrospective analysis of a prospectively collected data of all HPN patients and venous access from January 2013 to December 2018 managed at a National HPN Unit. The details of venous access, complications of CVC, sex and details of stoma extracted from the database.

**Results:** In a cohort of 9 HPN patients with tunnelled femoral CVC, 6 were females and 3 were males leading to a total of 8418 days. A total of 3 episodes of CRBSI were recorded in 1 patient. All of the 3 episodes (methicillin-sensitive *Staphylococcus aureus* (MSSA), *Escherichia Coli* and CNS) were successfully salvaged. The average no of days for femoral CVC was 935 days. The rate of CRBSI was 0.35 per 1000 catheter days. 8 patients had a stoma or open abdominal wound. There were no episodes of ipsilateral femoral DVT. The CVC was replaced for 2 patients due to fracture of CVC

**Conclusions:** Tunnelled femoral CVC CRBSI rate (0.35) is comparable to thoracic veins CVC CRBSI rate(0.31) in our unit. Furthermore, femoral access could be considered as reliable access to provide HPN. It may be considered as an option if more than 2 thoracic deep veins are occluded to prevent complete occlusion of SVC. We feel tunnelled femoral CVC is a safe option to consider for HPN

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**Disclosure of Interest:** None declared.

#### SUN-PO264

##### RESTING ENERGY EXPENDITURE OF PATIENTS WITH ALZHEIMER'S DISEASE, MILD COGNITIVE IMPAIRMENT AND CONTROLS: THE NUDAD PROJECT

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**Rationale:** Malnutrition is a common feature in patients with Alzheimer's disease (AD) and mild cognitive impairment (MCI), and might be caused by a reduced energy intake and/or a higher energy expenditure. Resting energy expenditure (REE) covers up to 70% of daily energy expenditure and might be elevated in patients with AD or MCI. We compared REE of patients with AD and MCI with controls and explored associations of AD biomarkers in cerebrospinal fluid with REE.

**Methods:** We included 29 patients with AD (age 70 ± 9y, 55%Female), 22 with MCI (70 ± 7y, 27%F) and 40 controls (63 ± 7y, 55%F). We assessed REE (kcal/d) by indirect calorimetry and fat-free mass (FFM, kg) by bio-electrical impedance analysis. Age, gender and FFM adjusted ANOVA was performed to compare the groups. Age, gender and FFM adjusted linear regression analyses were used to study associations of AD biomarkers (Aβ<sub>42</sub>, tau and p-tau) with REE.

**Results:** Adjusted for age, gender and FFM, groups did not differ in REE (patients with AD 1696 ± 43, with MCI 1762 ± 52, controls 1625 ± 36 kcal/d, p = 0.11). There were no associations of AD biomarkers with REE (Table 1).

**Table 1**

Associations of AD biomarkers in CSF with REE (kcal/d)

Aβ <sub>42</sub> (pg/ml)	-0.11 (-0.35; 0.13)
Tau (pg/ml)	0.02 (-0.17; 0.21)
P-tau (pg/ml)	0.30 (-1.63; 2.24)

Data presented as β (95% CI). AD = Alzheimer's disease; CSF = cerebrospinal fluid; Aβ<sub>42</sub> = β-amyloid 42; p-tau = phosphorylated tau; age, gender and fat-free mass adjusted linear regression analyses

**Conclusions:** Groups did not differ in REE, which is further supported by not finding associations of AD biomarkers with REE. The groups did not differ in FFM, i.e. nutritional status, however, we cannot exclude that groups were too small to observe differences. Other mechanisms, such as increased physical activity level or altered nutrient uptake, need to be studied as possible mechanism explaining malnutrition in patients with AD.

**Disclosure of Interest:** None declared.

#### SUN-PO265

##### USEFULNESS OF NUTRITION MANAGEMENT BY PERCUTANEOUS TRANS-ESOPHAGEAL GASTRO-TUBING

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**Rationale:** Percutaneous transesophageal gastro-tubing (PTEG) is a technique used in Japan to provide enteral nutrition and intestinal decompression in cases where percutaneous endoscopic gastrostomy (PEG) is impossible; this procedure was introduced in our hospital in June 2018. In order to clarify the outcomes of PTEG treatment at our hospital, a retrospective observational study was conducted.

**Methods:** Eight patients who switched from nasogastric tube to PTEG in our hospital from June 2018 to January 2019 were enrolled. The surveyed variables were age, sex, body mass index (BMI), serum albumin level (ALB) at the time of PTEG construction, baseline disease, reasons for PEG failure, complications at the time of PTEG construction, quality of life (QOL), body weight change following PTEG treatment, and 6-month survival rate.

**Results:** Six of the enrolled patients (75%) were men; the median age was 79.5 years; the median BMI was 17.4 kg/m<sup>2</sup>; and the median serum ALB was 3.2 g/dL. The reasons for PEG failure across the different cases were as follows: unsuitable stomach location, two cases; total gastrectomy, two cases; cancer invasion in the stomach, three cases; and abdominal radiotherapy effects, one case. There were no complications at the time of PTEG construction. In terms of QOL, all patients considered PTEG to be less painful and more cosmetically acceptable than a nasogastric tube. After PTEG, weight gain was observed in 50% of patients. The 6-month survival rate was 70%.

**Conclusions:** PTEG was safely constructed in all cases. It was a useful and well tolerated alternative to PEG for providing enteral nutrition. Awareness regarding PTEG as an alternative technique to PEG is not yet widespread, and it is important to disseminate the value of PTEG to medical professionals worldwide.

**Disclosure of Interest:** None declared.

#### SUN-PO266 INCREASING THE AMOUNT OF FISH OIL IN PARENTERAL NUTRITION: EFFECTS ON LIVER PARAMETERS AND TRIGLICERIDEMIA IN CRITICALLY ILL PATIENTS

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**Rationale:** The aim of this study was to assess the effects of a enriched fish oil lipid emulsion on recovering liver indicators (LI) and control of triglyceridemia (TG) in critically ill adult patients with parenteral nutrition (PN).

**Methods:** From July 2017 to March 2019 critically ill adult patients with PN were enrolled. Demographics, nutrients supplied, PN duration, surgery, ICU stay and laboratory data were collected. Patients were included after at least 4 days of PN and an increase of total bilirubin [TB] or gamma glutamyl transferase [GGT] from baseline levels at the start of PN greater than 40%. Patients were classified as standard-care (SC) group if no change in the content of the standard lipid emulsions was performed; or fish-oil (FO) group if they received  $\geq 5$  days of FO enriched emulsion, containing at least 90% (range 84–90%) of FO olive soybean emulsion (Smoflipid<sup>®</sup>) and at least 10% (range 10–16%) FO of based emulsion (Omegaven<sup>®</sup>). Evolution of LI (alanine aminotransferase, aspartate aminotransferase, TB, GGT, and alkaline phosphatase [AF] and TG) were compared in two points: switching to FO formula and back to standard lipid emulsion and end of PN.

**Results:** A total of 80 patients were included: 44 in SC and 36 in FO group, 43.8% female (n = 35) mean age 55.7  $\pm$  13.8 years. No differences

were found in mean baseline values such as TB, GGT, AF, albumin, age and TG. Mean values of GGT, TG and AF at switching point time were greater in the FO group. No differences were found during the study period in mean PN days (16.7  $\pm$  15.7 vs 16.3  $\pm$  12.2), mean energy (24.2  $\pm$  4.0 kcal/kg/d vs 24.9  $\pm$  3.5 kcal/kg/d) and mean lipid intake (0.75  $\pm$  0.25 g/kg/d vs 0.83  $\pm$  0.20 g/kg/d) for SC and FO respectively. T-paired tests showed a higher and significant decrease (p < 0.05) in FO patients in final GGT, AF and TG compared to SC patients. The % of patients lowering  $\geq 30\%$  of LI was significant greater in FO group (44.4 vs 15.9% for GGT; 18.2 vs 9.8% for TB).

**Conclusions:** FO enriched lipid emulsion formulations might help to recover liver impairment, as well as control of TG related to PN therapy. Protocols and strategies should be performed to identify patients that might get profit from this therapy.

**Disclosure of Interest:** None declared.

#### SUN-PO267 PHYTOSTEROLS DETERMINATION IN MULTICHAMBERBAG PARENTERAL NUTRITION

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**Rationale:** Phytosterols in lipid emulsions used in parenteral nutrition (PN) has been associated with alterations of liver parameters and hypertriglyceridemia. However content of phytosterols are currently undeclared in lipid emulsions. Although content in commercial lipid emulsions has been studied, there are not available data related to the content of phytosterols in commercial multichamberbags (MCBs). Therefore the determination of phytosterols in MCBs would allow the development of strategies to prevent or treat alterations related to phytosterols.

**Methods:** Batches of 5 MCBs commercially available in Europe from 3 different providers (Olimel N9 (lipid content: LCT + olive) with electrolytes; Smofkabiven (lipid content: LCT+MCT+olive+ fish oil) with and without electrolytes; Smofkabiven extra nitrogen with electrolytes; Nutriflex Lipid Special (lipid content: MCT+LCT) with and without electrolytes; and Nutriflex Omega (lipid content: MCT + LCT + fish oil) were analyzed. Differences in total phytosterol assay between MCBs and batches were statistically studied by a one-way ANOVA and Kruskal-Wallis non-parametric approximation and Bonferoni test.

**Table 1**

	Phytosterols (mg)/bag	Phytosterols (mg)/100 g
SmofKabiven (n = 13)	47.7 $\pm$ 3.4	3.2 $\pm$ 0.2
With electrolytes (n = 7)	47.0 $\pm$ 3.9	3.2 $\pm$ 0.3
Without electrolytes (n = 6)	45.6 $\pm$ 3.1	3.1 $\pm$ 0.2
Nutriflex-Lipid-Special 1250 mL (n = 8)	59.0 $\pm$ 3.2	4.7 $\pm$ 0.3
With electrolytes (n = 4)	60.1 $\pm$ 1.9	4.8 $\pm$ 0.2
Without electrolytes (n = 4)	57.9 $\pm$ 4.2	4.6 $\pm$ 0.4
Olimel-N9 (n = 9)		4.8 $\pm$ 0.2
100mL (n = 4)	51.3 $\pm$ 9.2	5.1 $\pm$ 1.0
150mL (n = 5)	71.9 $\pm$ 3.3	4.8 $\pm$ 0.2
Smofkabiven Extra Nitrogen (n = 3)		2.3 $\pm$ 0.2
Nutriflex Omega 1250 mL (n = 3)	53.0 $\pm$ 3.7	4.2 $\pm$ 0.3



**Table** (abstract: SUN-PO266):

	Start PN		Switching point		End switching		End PN	
	FO	SC	FO	SC	FO	SC	FO	SC
GGT (U/L)	83.8 ± 58.3	93.2 ± 61.7	559.4 ± 277.7	303.6 ± 142.8	555.9 ± 398.1	303.6 ± 142.8	505.4 ± 320.3	426.1 ± 452.0
FA (U/L)	94.8 ± 63.5	103.3 ± 50.6	289.1 ± 163.4	225.8 ± 216.6	316.7 ± 212.9	253.3 ± 163.3	306.6 ± 203.6	329.7 ± 452.5
TB (mg/dL)	1.05 ± 0.80	1.04 ± 0.91	1.38 ± 1.26	1.46 ± 1.27	1.49 ± 2.17	1.60 ± 1.69	1.30 ± 2.15	1.67 ± 2.19
TG (mg/dL)	127.9 ± 66.4	168.9 ± 129.5	265.2 ± 100.9	247.4 ± 112.1	217.4 ± 74.9	249.2 ± 123.6	245.1 ± 97.6	293.3 ± 147.5

**Results:** A total of 36 batches from 5 different MCBs were analyzed. The highest content in phytosterols per bag (73.6 ± 1.6 mg) was found in the Olimel N9 MCB with highest proportion of LCT. Statistically significant differences of phytosterol content were observed among the different MCBs studied and MCBs containing Smolflipid (Smofkabiven and Smofkabiven extra nitrogen;  $F=20.16$ ;  $p=0.000$ ; Table). However the ratio and amount of the different types of phytosterols did not show the same results. Among the different phytosterols (sitosterol, campesterol and stigmaterol): beta-sitosterol amount in Olimel MCB was statistically higher compared to the rest of the MCBs studied (60.5 ± 1.7 for Olimel vs 31.7 ± 2.5; 34.0 ± 2.1 and 29.9 ± 1.9 mg/bag for Smofkabiven 1250 mL, Nutriflex Lipid Special 1250 mL and Nutriflex Omega 1250 mL, respectively;  $F=69.5$   $p < 0.001$ ). Meanwhile the content per bag of stigmaterol were higher in the MCBs containing LCT + MCT mixture (11.3 ± 0.6 and 10.5 ± 0.8 mg for Nutriflex Lipid Special and Nutriflex Omega) compared to the rest of MCBs: 4.1 ± 0.7 mg and 6.5 ± 0.5 mg for Olimel 1500 mL and Smofkabiven, respectively ( $F=149.8$ ;  $p=0.000$ ).

**Conclusions:** MCBs commercially available on the European market contain variable quantities of phytosterols dependent on commercial brand and batch. MCBs with lipids containing fish oil showed significantly lower amount of phytosterols.

**Disclosure of Interest:** None declared.

#### SUN-PO268

##### HOW TO ADMINISTER HOME ENTERAL NUTRITION (HEN) MORE PRECISELY AMONG ADULT PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Rationale:** Adults, especially elders need a long time, averagely 17.5 times the length of hospital stay, to recover from malnutrition or the state of having nutritional risks. Therefore, just providing nutritional support (NS) during hospitalized period is not sufficient, which makes it reasonable to offer NS after discharge as well. This sort of NS is called Home Enteral Nutrition (HEN), a relatively mature healthcare service in developed countries, generally including Oral Nutritional Supplement (ONS) and Tube Feeding (TF). To figure out what effectiveness dose HEN have for patients' nutritional status and find some suggestions for the precise administration of HEN in China.

**Methods:** A systematic review and meta-analysis was conducted of randomized controlled trials (RCTs). We comprehensively searched 3 databases (PUBMED, OVID-CENTRAL and OVID-CDSR) for relevant studies and duplicated assessment of inclusion, data extraction, valid assessment and data tabulation.

**Results:** From 10167 studies obtained, 15 RCTs were included for the systematic review and meta-analysis, disappointingly none were judged at low risk of bias. 1 TF study and 4 ONS studies were narratively described because of their heterogeneity. The rest of ONS studies ( $n=7$ ) indicated small positive effects on nutritional status: after receiving ONS (energy  $\geq 200$  kcal/d) for not less than 10 weeks,

BW (Mean: 1.23 kg, 95%CI: [0.50, 1.95]), BMI (Mean: 0.61 kg/m<sup>2</sup>, 95% CI: [0.14, 1.09]), CC (Mean: 0.64 cm, 95%CI: [0.04, 1.24]) and MAC (Mean: 0.56 cm, 95%CI: [0.01, 1.11]) had significantly increased. However, there were no significant results observed in MAMC (Mean: 0.29 cm, 95%CI: [-0.07, 0.66]), HG (Mean: 0.50 kg, 95%CI: [-0.60, 1.60]), MNA-SF (Mean: 0.97 score, 95%CI: [-0.23, 2.17]) and TSF (Mean: 0.44 mm, 95%CI: [-0.71, 1.59]). The TF studies only revealed a positive result in BW (Mean: 2.67 kg, 95%CI [0.27, 5.07]) but not in HG (Mean 0.64 kg, 95%CI [-1.84, 3.12]) after receiving TF (energy = 10–50% of basal energy requirement) for 6–8 weeks.

**Conclusions:** HEN could have a positive effect on nutritional status for adult patients, but more studies were required to build a solid confirmation on this. The results also indicated the dosage and frequency of administration of ONS for generic patients requiring HEN. It'd be a better option for them to gain additional energy of at least 200 kcal/d for at least 10 consecutive weeks. If some specific parameters were demanded for the concerns of safety and effectiveness of HEN, for example, tracing HG among sarcopenia patients, 2 more weeks of ONS should be considered as a possible solution. The suggested duration and energy of HEN-TF would be 6–8 weeks and 10–50% of basal energy requirement respectively.

**Disclosure of Interest:** None declared.

#### SUN-PO269

##### IMPACT OF NUTRITIONAL SUPPORT ON PRESSURE ULCERS: A REVIEW OF CURRENT EVIDENCE

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**Rationale:** Pressure ulcers (PU) remain a vexing and distressingly common problem in patients living in long term care. Research suggests that malnutrition is an important risk factor for PU development. This study was conducted in order to analyze the impact of nutrition on pressure ulcers.

**Methods:** This study was designed based on the systematic review of randomised controlled trials (RCTs). RCTs were identified by searching Medline, ULAKBİM, Pubmed, Proquest, Web of Science between 2009 and 2019. Search terms included 'pressure ulcers,' 'pressure wounds,' 'pressure injury' in combination with 'nutrition' and 'supplements.' Data were qualitatively described using standard methods of systematic review described by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. PRISMA improves authors' reporting of systematic reviews and meta-analyses via a 27-item checklist with criteria for title, abstract, introduction, methods, results, discussion, and funding, along with a flow diagram for article selection. In order to summarize the data, a standard table was used.

**Results:** Of the 1195 articles identified, after applying inclusion and exclusion criteria, 6 articles were selected for review. These studies included a total of 620 participants (male and female), for a mean of 80,09 ± 7,82 participants with pressure ulcer stage II, III or IV. The patients population was composed of malnourished patients ( $n=1$ ),

tube-fed patients (1), elderly patients (n=2), non-malnourished patients (n=1), patients in long-term care/ home-care services (n=1). Intervention groups of these studies were used 'A nutrition formula enriched with protein, arginine, zinc, and vitamin C'; 'An energy-dense, protein-rich oral formula enriched with arginine, zinc, and antioxidants (400 mL/d)'; 'A nutrition formula contains protein 4.38 g, fat 2.23 g, and carbohydrate 15.62 g, all per 100 mL of product (37.9 ± 6.5 kcal/kg/day)'; 'Ornithine alpha-ketoglutarate once a day for 6 weeks'; 'A specific oral nutrition supplement, which was a high energy supplement enriched with arginine, antioxidants, and other micronutrients (600 ml/d)' and 'Disease-specific oral nutritional formula.' In all studies, it has been found that the nutrition intervention has improved PU healing, the size of ulcers and ulcer area.

**Conclusions:** The results suggest that nutrition intervention could directly improve the healing process on patients with pressure ulcer stage II, III or IV. The use of a various nutritional formula not only results in better healing of PUs, but also reduces the costs of local PU care from a local healthcare system perspective.

**Disclosure of Interest:** None declared.

#### SUN-PO270 TREATMENT OF HYPERGLYCEMIA IN NON-CRITICAL PATIENTS WITH PARENTERAL NUTRITION

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**Rationale:** Hyperglycemia is frequent in hospitalized patients up to 32–38%, the prevalence in patients with parenteral nutrition is higher. The objective of the study was to determine the prevalence of hyperglycemia in non-critically ill patients receiving parenteral nutrition and describe the management and risk factors in these patients.

**Methods:** A retrospective cohort of non-critical hospitalized patients >18 years who received parenteral nutrition from medical and surgical areas. Patients with type 1 diabetes mellitus, pregnant women, transfers to other centers and voluntary discharges were excluded. Hyperglycemia was defined with glucose levels ≥180 mg/dL. The glycemic protocols were focused on guaranteeing glycaemia less than 180 mg/dL, by administering rapid-acting insulin from glycaemia ≥140 mg/dL.

**Results:** We studied 96 patients, 56.3% women and 43.8% men, with a mean age of 54 ± 16.4 years, 35.4% presented hyperglycemia with a mean of 255.8 ± 55.39 mg/dL. In the prescription review of energy needs, ranges were reported of 25–35 cal/Kg/d and the glucose infusion rate was <4 mg/Kg/min. Insulin in parenteral nutrition was calculated considering the grams of carbohydrates provided, initially at 0.05 IU/g carbohydrate up to a maximum of 0.2 IU/g, 7% of patients required adding subcutaneous intermediate-acting insulin. The causes associated with poor control and increased hyperglycemia were the body mass index, the use of steroids and the presence of infection  $p < 0.05$ .

**Conclusions:** Hyperglycemia in non-critical patients receiving parenteral nutrition is frequent; body mass index, use of steroids and the presence of infection are associated with poor control. The optimization of the contribution of carbohydrates and the use of insulin contribute to the improvement of the glucose levels.

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**Disclosure of Interest:** None declared.

#### SUN-PO271 USEFULNESS OF ABDOMINAL ULTRASOUND VS. CHEST X-RAY IN NASOGASTRIC TUBE POSITIONING CHECK IN MALNOURISHED PATIENTS

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**Rationale:** Chest CT-scan is the gold standard for naso-gastric tube (NGT) position assessment (1). Chest x-ray (XR) is a valid alternative. In absence of XR, abdominal ultrasound (AU) can be used (1).

Thus, we aimed to verify the agreement between XR and AU in the assessment of NGT position in a secondary healthcare center.

**Methods:** From May 2018 to March 2019, we consecutively enrolled patients requiring NGT positioning, admitted to the Internal Medicine Unit of San Benedetto del Tronto General Hospital.

Before NGT placement, all the patients underwent a complete nutritional (bio-impedance analysis) and speech-pathologist assessment. After NGT placement, patients underwent XR and AU assessments. AU protocol followed codified criteria (2) by the same operator.

**Results:** We consecutively enrolled 46 patients (mean age 50 ± 1.5, F 24, BMI 18 ± 0.8 Kg/m<sup>2</sup>, phase angle 5.9 ± 0.4°). All patients had a significantly lower free fat mass content (65.5 ± 1.8%) indicative of malnutrition.

Correct NGT position was found in 100% of patients according to XR vs. 84% by AU.

AU showed a sensitivity and a specificity of 84% and 100% respectively, vs. XR.

Disagreement was found in 16% of patients (false negative due to abdominal bloating). Interestingly, severity of malnutrition did not predict AU assessment failure.

**Conclusions:** This prospective single-center study confirmed a good sensitivity and specificity of AU in bed-side in-patients NGT position assessment. AU could be used also in outpatients if larger multicenter prospective studies will confirm these preliminary results.

**Disclosure of Interest:** None declared.

#### SUN-PO272 PATIENTS PERCEPTION OF ORGANOLEPTIC CHARACTERISTICS OF ORAL NUTRITIONAL SUPPLEMENTS

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**Rationale:** Patients present low acceptance of diet and supplements during hospital stay and consequently worsening nutritional status. It was taken under consideration that evaluating oral nutritional supplements' (ONS) perception, regarding organoleptic characteristics by patient, is very important.

**Methods:** Cross-sectional study was performed patients in the tertiary hospital. Patients with exclusive oral feeding with ONS were included. The ONS formulae were classified as: high protein (>20% total energy from protein), normal protein (<20% total energy from protein), immune modulation and fiber containing (1.5 g/100 ml), distributed in 11 different flavors delivered during the hospital stay. The organoleptic characteristics for each ONS was obtained, with a maximum score of 45 points by appearance, texture, odor, taste and residual taste using a 9 points hedonic scale (1 = extremely dislike, 9 = extremely like). Statistical analyses ANOVA were performed using SPSS. The protocol was approved by Ethical Committee of the Hospital.

**Results:** 141 patients ( $54.6 \pm 16.9$  years, 50.4% male) were evaluated. Different perceptions of organoleptic characteristics for adults and elderly were observed ( $p < 0.05$ ). However normal protein and hiperenergetic ONS red fruits flavor ( $8.4 \pm 1.1$ ) was better than strawberry ( $8.0 \pm 1.0$ ), chocolate ( $7.4 \pm 2.1$ ) ( $p < 0.05$ ) flavors. The better result for five characteristics (43.7 points) was strawberry flavor for normal protein and hiperenergetic ONS. The lowest was strawberry with fiber (27 points). The residual taste and odor were disliked by the patients. Most ONS (68%) was higher than 35 points.

**Conclusions:** The organoleptic characteristics of ONS were well evaluated. However, the ONS products strawberry with fiber had worse residual taste and odor when compared to the others.

#### Reference

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**Disclosure of Interest:** None declared.

#### SUN-PO273

##### HOW DOES THE USE OF SODIUM GLYCEROPHOSPHATE AFFECT PERSONALIZED PARENTERAL NUTRITION ADMIXTURE STABILITY?

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**Rationale:** Personalized Parenteral Nutrition (PN) admixtures require organic phosphate to ensure admixture stability especially in children and prematures. Previously, we tested and used 1,6-fructose diphosphate, having low viscosity and sodium content. Unfortunately, it is no longer available in the market and the only substitute is sodium glycerophosphate. We aim to evaluate whether sodium glycerophosphate ensures the same PN admixture stability according to European Guidelines (droplet diameter maintained in the 0.4–1.0 micrometer range of chylomicra).

**Methods:** Stability studies were carried out on five admixtures (1 PN adult, 2 paediatric and 2 neonatal) with different calcium and phosphate contents. Each admixture was compounded with five different lipid emulsions with and without fish oil. The analyses were performed at time 0 ( $t=0$ ) and 24, 48, 72, 96 ( $t=96$ ) hours after compounding. Droplet diameters were determined by Light Scattering-Reverse Fourier Optics Technique. Every sample was triple tested for a total of 750 analyses. Statistical significance was verified by F-test.

**Results:** Physicochemical stability did not change between  $t=0$  and  $t=96$ . Droplet diameters were in the expected range of 0.4–1.0 micron, apart from the admixtures containing fish-oil based emulsion and calcium concentration above 4.5 mmol/L. In these last admixtures, 12% of droplet diameters were larger than 1.0 micron and 2% exceeded 5.0 micron immediately after compounding.

**Conclusions:** Sodium glycerophosphate, as previously observed when 1,6-fructose diphosphate was tested, assures PN personalized admixtures stability until 96 hours provided calcium content is lower than 4.5 mmol in admixture containing fish oil based emulsion. The downside of sodium glycerophosphate is its high sodium content which requires a careful consideration in clinical practice, especially for paediatric and neonatal patients.

**Disclosure of Interest:** None declared.

#### SUN-PO274

##### VALIDATION PROCESS OF A NEW CALORIMETER: IMPORTANCE OF A MIXING CHAMBER

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**Rationale:** Determination of the patients' energy expenditure (EE) is an important step to individualize energy prescription. Breath-by-breath technology is unsatisfactory: a new device is available and integrates a micro-mixing chamber technology and very rapid detection of FiO<sub>2</sub> and FeCO<sub>2</sub> changes (Q-NRG, Cosmed). Its reliability and precision have been validated in vitro against mass-spectrometry. The clinical validation has been undertaken by the multicenter international ICALIC study group; this sub-study reports the problems encountered during the validation process by the local group.

**Methods:** Indirect calorimetry studies (IC) were undertaken in 70 patients on mechanical ventilation. The QuarkRMR2 (Cosmed), and the Q-NRG (Cosmed) were connected in series using 3 different ventilators (Maquet Servo-I and -U, HamiltonS1) without any filter or humidifier on the inspiratory limb, with only one single HME (heat moisture exchange) filter close to the patient. Local primary endpoint was the agreement between the devices. Secondary local endpoints were clinical observations (practicality, airway and material handling, cleaning) Data as mean $\pm$ SD, Min-Max.

**Results:** Patients were aged  $60 \pm 17$  yrs (19F, 51M). The calibration is daily with QuarkRMR2 vs. monthly with Q-NRG. The warming-up takes 20 min for both devices. The first 60 measurements were done without inspiratory filter: a systematic difference was observed between the two device measures. While the mean difference was not significant, the minimal and maximal values differed significantly: respiratory quotient (QR):  $-0.42$  to  $+2.02$ , VO<sub>2</sub> – 267 to  $+312$  ml/min, VCO<sub>2</sub> – 181 to  $+240$  ml/min, resulting in large differences in derived EE from  $-1790$  to  $+2135$  kcal/d. The lowest QR and highest VO<sub>2</sub> were observed with the Q-NRG. Investigation enabled identification of the cause of the differences: the very rapid response time of the oxygen cell led to FiO<sub>2</sub> variability with every respiratory cycle. Insertion of a HME filter on the ventilator-outlet, i.e. insertion of a 30 ml additional pseudo-mixing chamber that dampened the cyclic pressure variations, resulted in agreement between devices (10 measures with  $\pm 5\%$  variation). Q-NRG with single use disposables was easier to handle and clean: insertion of the Pneumotach device on the endotracheal tube caused ventilatory instability in some patients, and required training of the dieticians

**Conclusions:** The new device provides rapid stable VO<sub>2</sub> and VCO<sub>2</sub> values, close to those obtained with the QuarkRMR, but is more practical; the battery offers a better autonomy. In our setting the Q-NRG requires more single use material (1 pneumotach, 2 catheters, 2 filters per measure). The connection to the patient requires specific skills in airway handling

**Disclosure of Interest:** None declared.

## Obesity and the metabolic syndrome I

#### SUN-PO275

##### ALTERATION OF BRAIN LIPIDS IN MURINE MODEL OF DIETARY OBESITY

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**Rationale:** High-fat western diet contributes to the obesity epidemic, which in turn is associated with increased risk of cancer, cardiovascular disease or type 2 diabetes. This dietary pattern involves higher saturated fatty acids (SFA) and n-6 polyunsaturated fatty acids (PUFA) intake and concurrent reduction of n-3 PUFA content. Members of n-3 PUFA, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), exhibit beneficial, neuroprotective properties. The aim of this study was evaluation of high-fat diet impact on brain PUFA.

**Methods:** Obesity was induced through administration of either high fat diet (HFD) with 60% fat to C57BL/6 mice (n = 10) or standard diet (SD), containing 10% fat – control mice (n = 10). After 19 weeks the mice were euthanized, and brains sampled. Gas chromatography-mass spectrometry was used to analyze total fatty acids (FA) content. Brain lipids were fractionated using two solid phase extraction methods and FA were profiled in each fraction. Parametric and nonparametric tests were used to estimate differences between HFD and SD mice.

**Results:** Dietary treatment resulted in around 30% increase of body mass of HFD mice, with similar to SD mice concentrations of total brain SFA, n-3 and n-6 PUFA. Remarkably, despite comparable composition of n-3 PUFA in SD and HFD chow, EPA content was halved in HFD brains. In brains of all mice the most abundant PUFA was DHA. Fractionation of brain extracts revealed changed percentage share of different groups in HFD mice, with significant increase in acylglycerols (AG) level. Moreover, separation showed significantly less glyco-sphingolipids and more sphingomyelins in HFD mice. Across all PL fractions level of EPA was decreased in HFD mice.

**Conclusions:** Consumption of high-fat diet induces changes in brain lipids composition. Increase of AG might induce resistance to leptin and insulin, whereas alterations in n-3 PUFA can negatively impact cognition and brain function.

#### Reference

Banks WA, Farr SA, Salameh TS, Niehoff ML, Rhea EM, Morley JE, *et al.* Triglycerides cross the blood–brain barrier and induce central leptin and insulin receptor resistance. *Int J Obes* 2018;42:391–7.

**Disclosure of Interest:** None declared.

#### SUN-PO276

##### FACTORS, BELIEFS AND BEHAVIORS RELATED TO THE USE OF WEIGHT LOSS SUPPLEMENTS

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**Rationale:** Increasing prevalence of overweight and obesity is a major worldwide problem associated with many metabolic comorbidities. Compliance with lifestyle modifications required for losing weight on long-term is poor. Weight loss supplements are widely used and easily available without prescription. They do not require strict regulations before being marketed and they are wrongly considered innocuous. The objective of this study was to explore knowledge and behaviors regarding weight loss supplements, and to assess socioeconomic, health and lifestyle characteristics related to their use.

**Methods:** This observational cross-sectional study was carried out between March and July 2018. A convenience sample of 200 adults, recruited from the clients of a pharmacy in Mount Lebanon, was equally divided into a group of users of weight loss supplements and a control group. Data on socio-demographic, lifestyle and health

characteristics were collected. Logistic regression analyses were conducted with the use of weight loss supplement as the dependent variable.

**Results:** The use of weight loss supplements was significantly associated with female gender (p=0.016), age above 45 years (p=0.01), being married (p=0.006), unemployment (p<0.001), low level of education (p=0.012) and smoking (p<0.001). Weight loss supplements were mainly recommended by friends (45%) and pharmacists (40%). Pharmacies were the most common sources (87%) for obtaining weight loss supplements. Around two-thirds of users reported experiencing side effects (59%), and considered that weight loss supplements are not safe (61%), not efficient (60%) and very expensive (67%).

**Conclusions:** Increased awareness should be provided to the community about the risks of using weight loss supplements.

**Disclosure of Interest:** None declared.

#### SUN-PO277

##### EFFECT OF MATERNAL CAFETERIA DIET AND TAURINE SUPPLEMENTATION ON BODY WEIGHT CHANGE, BODY FAT RATIO AND PLASMA LEPTIN LEVELS IN ADULT MALE AND FEMALE OFFSPRING

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**Rationale:** Maternal overnutrition during gestation and lactation affects the metabolic phenotype of the offspring. The efficacy of maternal taurine supplementation as an intervention in the setting of maternal overnutrition is not well documented. The aim of the present study was to evaluate the effect of maternal cafeteria diet and taurine supplementation on body weight change, body fat ratio and plasma leptin levels in adult male and female offspring.

**Methods:** Female Wistar rats were fed a control (CON) diet, CON supplemented with 1.5% taurine in drinking water (CONT), cafeteria diet (CAF) or CAF supplemented with taurine (CAFT) from weaning. After 8 weeks all animals were mated and maintained on the same diets during pregnancy and lactation. One male and female offspring from every dam weaned onto a control diet. Animals were culled and plasma samples were taken at 20 weeks of age. Repeated measures analysis of variance and factorial analysis of variance (ANOVA) tests were used for data analysis.

**Results:** Body weights did not differ between groups (p>0.05) but both male and female CAF rats presented greater body fat content at the age of 20 weeks. (CON male: 24.3 ± 1.44%, CONT male: 28.4 ± 1.61%, CAF male: 33.2 ± 1.44%, CAFT male: 29.9 ± 1.22%; CON female: 24.3 ± 1.32%, CONT female: 27.4 ± 1.22%, CAF female: 32.8 ± 1.44%, CAFT female: 26.2 ± 1.22%, p<0.01). Plasma leptin concentrations of CAF offspring were higher than CON offspring in both sexes (CON male: 80.14 ± 14.12 pg/mL, CONT male: 100.56 ± 15.47 pg/mL, CAF male: 129.61 ± 13.07 pg/mL, CAFT male: 111.35 ± 13.07 pg/mL; CON female: 64.45 ± 14.12 pg/mL, CONT female: 75.30 ± 12.23 pg/mL, CAF female: 98.71 ± 13.07 pg/mL, CAFT female: 70.09 ± 13.07 pg/mL, p<0.01).

**Conclusions:** Maternal exposure to a cafeteria diet and taurine supplementation had no effect on body weights but the offspring of rats fed a cafeteria diet showed greater fat accumulation compared with CON, CONT and CAFT groups. CAF group also displayed hyperleptinemia versus CON group. Therefore, taurine may induce anti-obesogenic effects when supplemented with CAF diet.

**Disclosure of Interest:** None declared.

**SUN-PO278****EFFECT OF MATERNAL CAFETERIA DIET AND TAURINE SUPPLEMENTATION ON GENE EXPRESSION PROFILE OF ADULT MALE AND FEMALE OFFSPRING'S LIVER**

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**Rationale:** Maternal overnutrition during gestation and lactation leads to disruption of pregnancy metabolism and affects both maternal and offspring's health. The effect of taurine supplementation on gene expression changes induced by maternal overnutrition is not well documented. This study aimed to evaluate the effect of maternal cafeteria diet and taurine supplementation on gene expression profile of adult male and female offspring's liver.

**Methods:** Female Wistar rats were fed a control (CON) diet, CON supplemented with 1.5% taurine in drinking water (CONT), cafeteria diet (CAF) or CAF supplemented with taurine (CAFT) from weaning. After 8 weeks all animals were mated and maintained on the same diets during pregnancy and lactation. One male and female offspring from every dam weaned onto a control diet. Animals were culled and liver samples were taken at 20 weeks of age. Whole genome microarray analysis was used to find out the effects of maternal cafeteria diet and taurine supplementation on gene expression profile of liver. Transcriptome analysis software was performed for statistical analysis (Fold change  $\geq 2$  or  $\leq -2$ ,  $p < 0.05$ )

**Results:** Microarray results showed that maternal cafeteria diet significantly upregulated 40 genes while significantly downregulated 78 genes (CAF vs CON) in adult male offspring's liver. Maternal cafeteria diet led to upregulation of 40 genes while downregulation of 80 genes (CAF vs CON) in adult female offspring's liver. 69 genes were upregulated whereas, 23 genes showed downregulation (CAFT vs CAF) in adult male offspring's liver in response to maternal taurine supplementation. Exposure to maternal taurine supplementation caused upregulation of 19 genes while downregulation of 11 genes (CAFT vs CAF) in adult female offspring's liver. When the gene pathways were analysed, results indicated that mostly lipid metabolism, oxidative stress, transcription factors and transmembrane transporter activity levels were affected.

**Conclusions:** These results suggest that maternal cafeteria diet and taurine supplementation leads to significant changes in liver gene expression patterns.

**Disclosure of Interest:** None declared.

**SUN-PO279****HOW DOES BARIATRIC SURGERY AFFECT FOOD TOLERANCE, PROTEIN INTAKE AND BODY COMPOSITION? COMPARISON OF THREE DIFFERENT SURGICAL PROCEDURES**

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**Rationale:** Reduced food tolerance is often associated to bariatric surgery (BS) which might affect energy and protein intake. The objective of this study was to assess the food tolerance, intake and body composition in patients that underwent Sleeve gastrectomy (SG), Biliopancreatic diversion (BPD) and Gastric Bypass (GB).

**Methods:** Retrospective observational study performed from July 2016 to February 2019. Patients that underwent BS with a follow up of 12

months were included. The food test tolerance, described by Suter et al. was administered to all patients 12 months after surgery. This test included one question about the self-perception **quality of the intake, food tolerance** of 7 food groups and the **presence or not of vomiting**, giving a global test score from 0 to 27 points (from worst to best food tolerance). A 24-h intake record was analyzed by a Registered Dietitian using Dietsource 3.0® software (Novartis Consumer Health-Cath Soft, 1997–2003). Body composition was assessed using bioelectrical impedance analysis. The statistical analysis included ANOVA test.

**Results:** 47 patients were included (74.5% women). Mean age 45.21 (SD 9.29) years. 14 patients underwent BPD, 21 SG and 12 GB.

Full results of food tolerance test, energy and protein intake are shown in table 1.

	12 months after surgery			
	BPD(n = 14)	SG(n = 21)	GB(n = 12)	p
Food Tolerance Score	26.0 (IQR 8.0)	23.00 (IQR 15.0)	22.0 (IQR 17.0)	0.007
Energy (Kcal)	1339.9 (IQR 1033.0)	943.60 (IQR 1553.3)	906.1 (IQR 1348.2)	0.036
Protein (g)	81.3 (IQR 74.8)	55.20 (IQR 77.6)	65.0 (IQR 69.4)	0.050

Body weight was 84.4(IQR 62.3)kg in BDP, 74.4(IQR 40.9)kg in SG and 81.7(IQR 24.7)kg in GB ( $p = 0.016$ ). Muscle mass was 56.6(IQR 46.3)kg in BDP, 49.3(IQR 44.9)kg in SG and 51.8 (IQR 37.4)kg in GB. No statistically differences were found in %WL and %MML.

**Conclusions:** One year after surgery patients that underwent BPD have a better food tolerance that is reflected in a better energy and protein intake.

**Reference**

Suter et al. *Obes Surg* 2007;17:2–8.

**Disclosure of Interest:** None declared.

**SUN-PO280****RELATION OF BINGE EATING DISORDER, NUTRITIONAL STATUS AND PRESENCE OF METABOLIC DISEASES IN OBESE PATIENTS**

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**Rationale:** Binge Eating Disorder (BED) is the most prevalent eating disorders and it is an important risk factor for obesity and metabolic syndrom<sup>1</sup>. The aim of this study was to evaluate the relationship of BED with nutritional status and the presence of metabolic diseases in obese outpatients.

**Methods:** We included obese adult outpatients, according to BMI classification, attended at a Nutrition Outpatient Clinic, in a general hospital in the South of Brazil. Weight, height and waist circumference (WC) were evaluated. Structured questionnaires were applied to obtain information on dietary habits. The presence of metabolic diseases was verified in an electronic medical record. The *Binge Eating Scale* was applied with the aim of diagnosing BED and its severity (0–17 points: no disorder, 18–26: moderate disorder, >27: severe disorder). The research was approved by the ethics committee of the hospital. Chi-square and t-tests were used for statistical analysis.

**Results:** A total of 56 obese adult patients was included. The prevalence of BED in the studied population was 28.6% (17.9%

moderate disorder, 10.7% severe disorder), being more found in women (35.7%,  $p = 0.047$ ). Both weight, BMI (mean  $38.07 \pm 5.68$ ) and WC (mean  $116.61 \pm 13.74$ ) were higher in patients with BED, but the data were not significant ( $p = 0.167$  and  $0.185$ ). The daily consumption of fruits and vegetables was higher in the group without BED (65% and 67.5%  $\times$  56.2%). Among the patients with BED, 87.5% reported daily consumption of processed meats, versus 60% of patients without BED. The most frequent metabolic disease in the BED group was type 2 diabetes mellitus (75%), followed by hypertension (68.7%). In addition, 62.5% of the patients with BED reported restrictive diets.

**Conclusions:** The difference between nutrition status of obese patients with and without BED was not statistically significant. The prevalence of type 2 diabetes was high in the group with BED. Most of the patients with BED have already performed restrictive diets.

#### Reference

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**Disclosure of Interest:** None declared.

#### SUN-PO281

##### INCREASED PLASMA CONJUGATED CHENODEOXYCHOLIC ACID: A POSSIBLE KEY-MEDIATOR OF TYPE 2 DIABETES IMPROVEMENT AFTER ROUX-EN-Y GASTRIC BYPASS

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**Rationale:** Bile Acids (BAs) are key signaling and regulatory molecules with systemic endocrine functions and can integrate metabolic regulation by activating specific receptors. Roux-en-Y gastric bypass (RYGB) is associated with increased plasma BAs levels, and this has been suggested as a main factor of metabolic improvements observed in the early postoperative response, specially type 2 diabetes (T2D) control. We assessed the effect of RYGB on plasma BAs levels in obese patients and its potential relationship with T2D remission.

**Methods:** Plasma samples were collected from obese women with T2D ( $n = 21$ ) before and 3-month after RYGB. Twenty-four plasma BAs from primary and secondary biosynthesis were measured by liquid chromatography – triple quadrupole mass spectrometer in a targeted approach. Patients were classified as responsive and nonresponsive to T2D remission, and BAs alterations were compared by Wilcoxon test and fold change.

**Results:** By comparing patients according T2D remission, different altered BAs profile were observed. Increased levels of a primary BA conjugated with both glycine and taurine (glycochenodeoxycholic and taurochenodeoxycholic acids) was observed in responsive patients, while nonresponsive patients showed alterations in two secondary BAs: increased glycodeoxycholic acid and a decreased lithocholic acid ( $p \leq 0.05$ ).

**Conclusions:** RYGB changed BAs levels, showing a different pattern of alterations according to T2D remission. This indicates triggering a different metabolic route, once that chenodeoxycholic acid, altered in responsive patients is more likely to activate farnesoid X receptor; while altered BAs identified in nonresponsive patients are more likely to activate Takeda G-protein receptor 5. This BAs could act at different key points of glucose metabolism, conditioning T2D improvement after RYGB.

**Disclosure of Interest:** None declared.

#### SUN-PO282

##### BENEFICIAL EFFECTS OF LOW-CALORIE DIET ON VISCERAL ADIPOSITY AND ADIPOKINE PROFILE

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**Rationale:** Abdominal obesity is associated with dyslipidemia, hypertension, insulin resistance, and metabolic syndrome. An excess of visceral fat is related to the dysregulated secretion of adipokines which influence the vascular function and overall inflammation and may be involved in cardiovascular risk. The adipokines are used as adjunctive markers of metabolic disorders. The purpose of our study is to evaluate the effects of energy intake restriction on visceral fat and adipokine status.

**Methods:** The study involved sixty middle-aged obese women (mean body mass index  $35.3 \text{ kg/m}^2$ ). We collected the data of anthropometry, body composition analysis (InBody 770, Biospace Co., Ltd, Korea), and biochemical markers (Konelab Prime 60i, Thermo Scientific, Wilmington, DE, USA) before and after 1-month dietary intervention.

**Results:** There was a significant decrease in body weight, fat mass and visceral fat area (4.15 kg, 3.1 kg, and  $12.67 \text{ cm}^2$ , respectively;  $p < 0.05$ ). 49 (81.7%) women had elevated leptin levels; 22 (36.7%) had elevated adiponectin levels. The average values were 49.92 ng/ml and 11.26  $\mu\text{g/ml}$ , respectively. After the dietary intervention, a significant decrease in leptin and adiponectin levels were observed; however, the leptin/adiponectin ratio did not show marked changes. After 1 month, the normal leptin level was reached in 23 (38.3%) patients, while normal adiponectin level was found in most patients (91.7%). The initial visceral fat area correlated with leptin ( $r^2 0.53$ ), insulin ( $r^2 0.38$ ), and C-peptide ( $r^2 0.42$ ) values.

**Conclusions:** The restriction of the energy intake leads to significant positive changes in fat mass, visceral fat area, and adipokine status and provide another biological explanation for the beneficial effect of weight loss on reducing cardiovascular and diabetes risks in obese patients. Correlation analysis also confirmed the relationship between visceral fat, leptin and insulin levels, which is consistent with data on the dramatic metabolic activity of the visceral adipocyte pool.

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**Disclosure of Interest:** None declared.

#### SUN-PO283

##### IMPROVEMENT IN INFLAMMATORY POTENTIAL OF DIETARY PATTERN COULD CONTRIBUTE TO BETTER CARDIOMETABOLIC RISK PROFILE

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**Rationale:** Dietary patterns such as Mediterranean Diet with their anti-inflammatory properties are associated with a decreased cardiometabolic risk profile. Our objective was to evaluate the association between the inflammatory potential of the diet and some anthropometric variables that are indicators of cardiometabolic risk.

**Methods:** Eligible participants ( $n = 833$ , 446 male, 387 female, mean age  $24.8 \pm 5.2$  years) were recruited from Erciyes University's Main Campus. All data were gathered through interviews and clinical



measurements. The dietary inflammatory index (DII) was computed using 24-hour recalls. Lower DII scores indicate a lower inflammatory potential of the diet. It was also reported that the DII score could take on values ranging +8 (maximally pro-inflammatory) to -9 (maximally anti-inflammatory). A fourteen-item dietary screener was used to assess adherence to the Mediterranean diet (MeDiet). Each item is worth 0 or 1 point. Higher scores reflect higher adherence. Anthropometric measurements, including height, body weight, waist circumference (WC), hip circumference (HC) and neck circumference were evaluated according to standardized protocols. Partial correlation coefficient was used to assess the relationship between DII, adherence to the MeDiet and some anthropometric variables controlling for energy intake. Statistical significance was accepted as  $p < 0.05$ .

**Results:** The mean DII score was  $1.24 \pm 1.50$  (min: -2.97, max: 4.75), whereas score of adherence to the MeDiet was  $6.04 \pm 2.36$  (min: 0.0, max: 13.0). DII showed significant positive correlation with body weight ( $r = 0.097$ ,  $p = 0.005$ ), WC ( $r = 0.082$ ,  $p = 0.018$ ) and waist-hip ratio ( $r = 0.113$ ,  $p = 0.001$ ), while adherence to the MeDiet showed significant negative correlation with body weight ( $r = -0.096$ ,  $p = 0.005$ ), waist-hip ratio ( $r = -0.081$ ,  $p = 0.020$ ) and neck circumference ( $r = -0.172$ ,  $p = 0.000$ ). In addition, there was a significant negative correlation between DII and adherence to the MeDiet ( $r = -0.100$ ,  $p = 0.004$ ).

**Conclusions:** An enhancement of dietary inflammatory potential with better adherence to a MeDiet would improve the cardiometabolic profile by supporting obesity management.

**Disclosure of Interest:** None declared.

#### SUN-PO284

##### THE ASSOCIATION BETWEEN DIETARY PROTEIN INTAKE AND FAT FREE MASS SIX MONTHS AFTER ROUX-EN-Y GASTRIC BYPASS: A CROSS SECTIONAL STUDY

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**Rationale:** Roux-en-Y gastric bypass (RYGB) is the most effective treatment for morbid obesity. One of the side-effects of RYGB is loss of fat free mass (FFM). The preservation of FFM during weight loss (WL) can be stimulated by high protein intake combined with resistance training. However, it remains unclear whether this also applies to patients undergoing RYGB. The aim was to examine the association between dietary protein intake (DPI) and FFM six months post-operative in patients undergoing RYGB correcting for the potential distorting effect of physical activity.

**Methods:** This cross-sectional study included patients who underwent RYGB at the Maasstad Hospital. Data were collected at the outpatient clinic five to seven months postoperative. Collected data consisted of sociodemographic variables, three-day food diaries, body composition measured by bio-electrical impedance analysis, anthropometric variables and information regarding physical activity. Multiple linear regression analysis was used to investigate the association between DPI and percentage FFM (%FFM).

**Results:** 76 patients (80.3% women; mean age  $46.1 \pm 9.8$  years) were included. Only 44.7% of the patients met the general protein recommendation of  $\geq 60$  grams per day. There was a significant difference in %FFM between patients consuming  $< 80$  grams of protein and patients consuming  $\geq 80$  grams of protein (67.4% vs. 72.4%;  $p = 0.035$ ). There was no difference between patients consuming  $< 60$  grams of protein compared to patients consuming  $\geq 60$  grams of protein. DPI was not significantly associated with %FFM in linear regression analysis six months after RYGB corrected for physical activity, gender, % excess WL, energy intake and preoperative BMI ( $\beta = 0.006$ ;  $p = 0.872$ ).

**Conclusions:** Low DPI after RYGB was common in this study. There was no significant association between DPI and %FFM six months after RYGB after correction for confounding.

**Disclosure of Interest:** None declared.

#### SUN-PO285

##### IMPLICATION OF THE GUT MICROBIOTA IN PERSONALIZED METABOLIC RESPONSE TO DIETARY INULIN IN OBESE PATIENTS

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**Rationale:** Dietary supplementation with inulin as a prebiotic has been shown to lessen obesity and related metabolic disorders in some individuals. Using mice transferred with the fecal microbiota from obese patients, we have addressed the following question: do the characteristics of the gut microbiota in obese individuals explain the different physiological response to prebiotics?

**Methods:** The gut microbiota of four-week old mice was depleted using antibiotics. C57BL/6J Mice were then colonized with stools from one of the four human obese patients (hum-ob) selected for different gut microbiota composition. Conventional and hum-ob mice were then fed with a high-fat diet (HFD) during four additional weeks, supplemented or not with native inulin (Cosucra) (6–9 mice per group).

**Results:** We demonstrated a different response to inulin supplementation in hum-ob mice upon a HFD. Inulin supplementation largely reduced the body weight of hum-ob mice for only one donor ( $p < 0.05$ ). Inulin significantly reduced hepatic steatosis (lipids and triglycerides content), as well as the increased adiposity induced by HFD for two donors. Despite an increased cecal content – signing gut fermentation – observed in all humanized mice, the regulation of the gut microbiota by inulin differs between donors. The model of hum-ob mice allowed us to point out new bacteria associated to the metabolic response to inulin. In addition, some bacterial genera (*Barnesiella*, *Victivallis*, *Akkermansia*...) are correlated with the observed metabolic outcomes in hum-ob mice. Interestingly, most of these bacteria seems to be involved in the differential response by inulin observed in a clinical trial with obese patients (NCT03852069).

**Conclusions:** Our work using a model of gut microbiota transfer from patients into mice highlighted the differential response of humanized mice to dietary supplementation with inulin. We propose that the gut microbiota is an important component to be taken into account for personalized nutrition related to prebiotic dietary fibers in the future.

**Disclosure of Interest:** None declared.

#### SUN-PO286

##### WEIGHT LOSS, REMISSION OF COMORBIDITIES, AND QUALITY OF LIFE TWO YEARS AFTER BARIATRIC SURGERY

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**Rationale:** Bariatric surgery (BS) is the most effective treatment for morbid obesity. However, data are scarce regarding long-term changes in quality of life (QoL) of this procedure and regarding predictors for the improvement in QoL. Thus, our aims were to describe the health status, QoL 24 months following BS and assess whether those changes are linked to magnitude of weight loss.

**Methods:** Cross-sectional study. Using electronic medical records from patients who underwent BS two years before study, data related to weight, evolution of comorbidities and early or late complications linked to BS were collected. Efficacy of surgery and changes in QoL were evaluated by Bariatric Analysis and Reporting Outcome System (BAROS) questionnaire.

**Results:** 43 patients (72.1% women, aged  $38.2 \pm 9.2$  years) were evaluated. Before BS, weight was  $139.9 \pm 19.4$  Kg; body mass index (BMI):  $52.7 \pm 7.3$  Kg/m<sup>2</sup>. Major and metabolic comorbidities were present in 83.7% and 58.1%, respectively. Early and late complications linked to BS were present in 11.7% and 21.2% of the cohort, respectively. Two years after BS, mean BMI was  $30.6 \pm 4.6$  Kg/m<sup>2</sup>, percentage of weight loss  $40.9 \pm 9.7\%$  and total or partial remission of comorbidities was observed in 91.6% of patients. Score BAROS classified QoL as 'excellent' in 59.6% and as 'good' or 'very good' in 38.1%. Changes in QoL were not significantly linked to magnitude of weight loss or development of complications.

**Conclusions:** BS provided long-term improvement in QoL in a large number of patients with morbid obesity that is not linked to weight loss magnitude or early or late complications linked to surgical procedure.

**Disclosure of Interest:** None declared.

#### SUN-PO287

##### BIOIMPEDANCE ANALYSIS OVERESTIMATES APPENDICULAR SKELETAL MUSCLE MASS FOR SEVERELY OBESE PEOPLE BUT MIGHT BE A GOOD ALTERNATIVE MEASUREMENT

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**Rationale:** Although measurement of appendicular skeletal muscle mass (ASM) using dual-energy X-ray absorptiometry (DXA) is the gold standard for the diagnosis of low muscle mass, bioelectrical impedance analysis (BIA) might be a cheaper and easily available alternative to diagnose sarcopenic obesity

**Methods:** Cross-sectional observational study to compare measurements of ASM and whole fat mass (FM) obtained using dual energy X-ray absorptiometry (DXA, Lunar iDXA, GE Healthcare, USA) and bioelectrical impedance analysis (BIA, MC-780A; TANITA, Tokyo, Japan) performed in the same day in patients with morbid obesity submitted to our Obesity Clinic. Exclusion criteria were weight over 150 kg, difficulty in maintaining an upright position or presence of pacemakers. ASM (sum of lean mass in both legs and arms), ASM/height<sup>2</sup> and ASM/BMI are reported as median (interquartile range) as Kolmogorov-Smirnov test confirmed a non-normal distribution; FM is reported as mean (standard deviation) as it adjusted to a normal distribution. Bland Altman method was used to compare BIA vs DXA and reliability analysis was performed using intraclass correlation coefficient (ICC)

**Results:** 72 patients with BMI >35 (mean  $42.5$  Kg/m<sup>2</sup>, SD 4.9) were included, 73.6% were women, mean age  $42.3$  (SD 8.5). ASM measured by BIA was  $26.2$  (9.4) kg and by DXA  $20.9$  (5.9) kg; ASM/height<sup>2</sup> by BIA  $9.8$  (2.1) and by DXA  $7.8$  (1.5) kg/m<sup>2</sup>; ASM/BMI by BIA  $0.58$  (0.2) and by DXA  $0.46$  (0.15). FM by BIA was  $56.4$  (9.4) kg and by DXA  $51.5$  (5.9) kg

	ICC (95% confidence interval)	BIA-DXA Bias (Limits of agreement)
ASM (kg)	0.874 (0.796–0.922)	+7.1 (–0.8,+15.1)
ASM/height <sup>2</sup> (kg/m <sup>2</sup> )	0.730 (0.564–0.833)	+2.5 (–0.0,+5.1)
ASM/BMI	0.902 (0.841–0.939)	+0.16 (–0.01,+0.32)
FM (kg)	0.929 (0.886–0.956)	–3.7 (–13.5,+6.2)

**Conclusions:** Although BIA overestimated ASM (and consequently ASM/height<sup>2</sup> and ASM/BMI) and underestimated FM compared with DXA, reliability analysis showed an excellent intraclass correlation. This differences must be taken into account to diagnose sarcopenic obesity, so cut-off points for BIA should be defined

**Disclosure of Interest:** None declared.

#### SUN-PO288

##### LACK OF CONCORDANCE AMONG DIFFERENT DEFINITIONS OF SARCOPENIC OBESITY IN PEOPLE WITH MORBID OBESITY

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**Rationale:** Low muscle mass and quality have a strong negative prognostic impact in obese individuals. However, consensus on the definition and diagnostic criteria of sarcopenic obesity is lacking

**Methods:** Cross-sectional observational study to assess the prevalence of sarcopenic obesity in patients with morbid obesity. The study was approved by the Ethical Research Committee of the CAULE (approval no 1775/2017). Dual energy X-ray absorptiometry (DXA, Lunar iDXA, GE Healthcare, USA) and bioelectrical impedance analysis (BIA, MC-780A; TANITA, Japan) were performed in the same day. Hand grip strength (HGS) was measured with Dynx<sup>R</sup> (Akern, Italy) and physical performance was assessed by timed up and go test (TUG), both are expressed as median(interquartile range). Fat mass/free fat mass ratio (FM/FFM) using BIA, appendicular skeletal muscle mass (ASM) by DXA, ASM/height<sup>2</sup> and ASM/BMI were used to assess SO by different definitions (table 1). Concordance among different definitions was assessed by Cohen's kappa test. Mann Whitney U- test was used to assess relationship of different definitions with either hand grip strength or TUG.

**Table 1**

Author	Criteria	Men 18–40 years old	Men 40–60 years old	Women 18–40 years old	Women 40–60 years old
Xiao CN 2018 (1)	FM/FFM (BIA) >percentile 95	0%	27,3%	0%	3,2%
EWGSOP 2 (2) and FNIH (3)	ASM (DXA) <20 kg men/<15 women	0%	0%	4,8%	3,4%
EWGSOP2 (2)	ASM/height <sup>2</sup> (DXA) <7 kg/m <sup>2</sup> men/<6 women	0%	0%	4,8%	3,4%
Masanés 2012 (4)	ASM/height <sup>2</sup> (BIA) <8.31 Kg/m <sup>2</sup> men/<6.68 Kg/m <sup>2</sup> women	25%	36,4%	19%	10,3%
Chiles Shaffer (5)	ASM/BMI <0.725 <0.591	62,5%	81,8%	100%	100%

**Results:** 72 patients with BMI >35 (mean 42.5 Kg/m<sup>2</sup>, SD 4.9) were included, 73.6% were women, mean age 42.3 (SD 8.5, range 22–59). HGS was 23.8 kg/13.4) and TUG 9.0 sec (2,15). Table 1 shows the prevalence of sarcopenic obesity (%) according to different criteria. Cohen's kappa tests were below 0.2 for all the combinations of criteria. No differences were found in either hand grip strength or TUG, no matter the definition of SO used.

**Conclusions:** Definition of sarcopenia in obese people is challenging and concordance among current criteria is very poor in our patients with morbid obesity. Further research is needed for a consensus definition.

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**Disclosure of Interest:** None declared.

#### SUN-PO289

##### FAT MASS TO FAT-FREE MASS RATIO IN PEOPLE WITH MORBID OBESITY AS A MARKER OF SARCOGENIC OBESITY

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**Rationale:** A high fat mass to fat-free mass ratio (FM/FFM) has been postulated (1) as a marker of sarcopenic obesity (SO) and linked to worse health outcomes. Diagnosing this condition might be challenging

**Methods:** Cross-sectional observational study to assess FM/FFM in patients with morbid obesity submitted to our Obesity Clinic. The study was approved by the Ethical Research Committee of the CAULE (approval no 1775/2017) and after written informed consent, patients underwent dual energy X-ray absorptiometry (DXA, Lunar iDXA, GE Healthcare, USA) and bioelectrical impedance analysis (BIA, MC-780A; TANITA, Tokyo, Japan) performed in the same day. Exclusion criteria were weight over 150 kg, difficulty in maintaining an upright position or presence of pacemakers.

FM/FFM was calculated for DXA- and BIA-based measurements and reference values using BIA published by Xiao were used to assess SO, defined by a FM/FFM ratio greater than the 95th percentile of sex, BMI and age. Bland Altman method was used to compare BIA vs DXA and reliability analysis was performed using intraclass correlation coefficient (ICC).

**Results:** 72 patients with BMI >35 (mean 42.5 Kg/m<sup>2</sup>, SD 4.9) were included, 73.6% were women, mean age 42.3 (SD 8.5, range 22–59). FM by BIA was 56.4 (9.4) kg and by DXA 51.5 (5.9) kg. Table 1 shows median and interquartile range for measurements, ICC and limits of agreement. FM/FFM was higher for females in the range of 40–60 years-old. According to Xiao et al reference values, 4.2% of our patients had a FM/FFM higher than P95

**Table 1**

	BIA	DXA	ICC (95% confidence interval)	BIA-DXA Bias (Limits of agreement)
FM (kg)	57.7 (48.2–63.0)	59.9 (54.0–67.6)	0.929 (0.886–0.956)	–3.7 (–13.5,+6.2)
FFM (kg)	66.1 (60.5–76.0)	61.2(55.4–71.8)	0.955 (0.927–0.972)	+3.6(–6.4,+13.6)
FM/FFM	0.82 (0.74–0.93)	0.96 (0.76–1.15)	0.755 (0.605–0.848)	–0.23 (–0.54,+0.07)

**Conclusions:** FM/FFM ratio classified 4.2% of our patients as having sarcopenic obesity. Although BIA infraestimates FM/FFM, a good ICC makes it a suitable measurement vs DXA

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**Disclosure of Interest:** None declared.

## Paediatrics I

#### SUN-PO290

##### BONE MINERAL DENSITY IN CHILDREN SUBMITTED TO DAIRY RESTRICTION

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**Rationale:** Calcium is one of the responsible nutrients for bone health and can only be obtained exogenously through food. Dairy is the richest source of calcium in our diet. The aim of this study was to determine whether children who do not consume dairy products regularly show adequate bone mineral density.

**Methods:** Anthropometry (weight, height and abdominal circumference) and body composition (DEXA) children aged 3 to 11 years regularly restricting milk intake were evaluated. A questionnaire of habits and feeding frequency was also applied.

**Results:** Seventeen children were included, with a mean age of 6.7 years old. Four children were taking vitamin D supplementation; none was taking calcium. All children showed adequate height Z Score (–2 to +1). Sixteen individuals were breastfed in the past with a mean duration of exclusive breastfeeding of 5.6 months. Mean total time of breastfeeding was 25.3 months.

Thirteen subjects do never consume dairy or do it less than once a month. The remainder consumed it 1 to 3 times a month. Two children reported drink fortified vegetable beverages on a daily basis, 7 drink once a week and the rest do it even less often.

About the consumption of dark green vegetables, 2 kids consume 4 to 5 servings per day, 7 consume 2 to 3 servings per day and 3 one per day. The rest ingest once a week.

The parents of 6 children find that their descendants consume few dark green vegetables and seaweed. Sixteen consume added sugar food less than once a month.

Average BMD Z-Score was –1.05, with 6 children presenting BMD Z-Score adequate (–1 to +1). The remaining 6 showed values lower than –1.

**Conclusions:** Children submitted to dairy restriction do not seem to accomplish calcium requirements. This may justify that low bone mineral density was present in half of the sample.

The intake of 2 servings of calcium-fortified vegetable drinks per day and the increase the intake of dark green vegetables is, thus, suggested.

**Disclosure of Interest:** None declared.



**SUN-PO291****BREAST MILK FATTY ACIDS INFLUENCE INFANT GROWTH AND COGNITION: THE PREOBE STUDY**

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**Rationale:** Breast milk reflects the maternal nutritional status and is a key source of polyunsaturated fatty acids (PUFAs), crucial in growth and development, especially arachidonic (AA) and docosahexaenoic acid (DHA). This study aimed to analyze the effect of colostrum fatty acids (FAs) on infant outcomes to raise awareness about the programming effect of maternal nutrition and promote a healthy diet in women.

**Methods:** Mother-child pairs (n=78) of the PREOBE cohort were classified in normal-weight, overweight and obese mothers. PUFAs and long-chain PUFAs (LCPUFAs) were determined in colostrum collected 2–4 days and are presented in percentage of total FAs. Infant body mass index-for-age z-scores (BMIZ) were measured at 6, 18 and 36 months of age. Cognition was assessed at 18 months of age with the Bayley-III Scale. Maternal pre-pregnancy weight and infant feeding practice were considered for analysis.

**Results:** BMIZ at 6 months of age were inversely associated with colostrum levels of AA ( $\beta$ -0.44,  $p$  0.02), DHA ( $\beta$ -0.37,  $p$  0.04), PUFAn3 ( $\beta$ -0.38,  $p$  0.04), LCPUFAn6 ( $\beta$ -0.38,  $p$  0.04), LCPUFAn3 ( $\beta$ -0.43,  $p$  0.02), whereas n6:n3 ratio was positively associated with it ( $\beta$  0.42,  $p$  0.03). Cognition of infants born to normal-weight mothers was enhanced with colostrum linoleic acid ( $\beta$  0.84,  $p$ <0.001) and PUFAn6 ( $\beta$  0.81,  $p$  0.002). Infant cognition of overweight mothers was endorsed with DHA ( $\beta$  0.88,  $p$  0.04) and LCPUFAn3 ( $\beta$  1.01,  $p$  0.004), while the n6:n3 ratio ( $\beta$ -0.97,  $p$  0.02) showed an inverse association.

**Conclusions:** The early supply of n6 and n3 impacts infant nutritional status and cognition, at 6 and 18 months of life, respectively. This study endorses the need for preventive health care. Since breast milk influences the early nutritional status of the child, which is related to health conditions through life span, a healthy diet in women should be encouraged to increase the quality of breast milk and promote healthier future generations.

**Disclosure of Interest:** None declared.

**SUN-PO292****BREASTFEEDING PROMOTES A HEALTHIER FATTY ACID COMPOSITION IN THE OFFSPRING COMPARED TO ARTIFICIAL AND MIXED FEEDING: THE PREOBE STUDY**

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**Rationale:** Early life nutrition has a programming effect in the future health of the child and, even when the World Health Organization recommends exclusive breastfeeding up to 6 months of age with continued breastfeeding up to 2 years of age or beyond, the rate of breastfeeding is alarmingly low. Since polyunsaturated fatty acids (PUFAs) and long-chain PUFAs (LCPUFAs) play a crucial role in survival, growth and development of the child, the aim of this study was to analyze the effect of infant feeding practices in their FA levels and to discuss the implications in future health to promote breastfeeding in the scientific community and citizens.

**Methods:** Children of the PREOBE study were included (n=102). FAs were analyzed from cheek cell samples collected at 6 months of age of children that were 1) breastfed and 2) formula or mixed-fed during their first 3 months of life. Potential cofounders, such as pre-pregnancy maternal weight status and infant gender, were considered to perform the analysis.

**Results:** Infant linoleic acid ( $\beta$ =0.37;  $p$ <0.001), arachidonic acid ( $\beta$ =0.22;  $p$ =0.026), PUFAn6 ( $\beta$ =0.39;  $p$ <0.001), LCPUFAn6 ( $\beta$ =0.23;  $p$ =0.019), docosahexaenoic acid ( $\beta$ =0.29;  $p$ =0.003) and LCPUFAn3 ( $\beta$ =0.22;  $p$ =0.032) levels were positively associated with exclusive breastfeeding. Instead,  $\alpha$ -linolenic acid was negatively associated with it ( $\beta$ =-0.41;  $p$ <0.001), possibly due to an increased DHA conversion.

**Conclusions:** Exclusive breastfeeding is associated to a healthier infant FA composition, known to enhance neurodevelopment and growth and protect from conditions, such as cardiovascular diseases and allergies. This information provides further evidence of the positive programming impact of breastfeeding in future health. Dissemination of these results can contribute to raise public awareness and engage society and health care providers to promote breastfeeding beyond other feeding practices.

**Disclosure of Interest:** None declared.

**SUN-PO293****9TH PAEDIATRIC NUTRITION WEEK (2018) – GROWTH DATA IN HOSPITALIZED CHILDREN**

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**Rationale:** Although the diagnosis of malnutrition includes the analysis of growth charts, most studies assessing the nutritional status only consider nutritional indices. The aim of our study was to analyze previous growth data in hospitalized children.

**Methods:** This observational study included hospitalized children from March 12 to 23, 2018 in the French participating centers. Children from 0 to 18 years old were included, except premature infants. The date, weight and height of the last known point of the health book were recorded. Nutritional status was assessed at admission and discharge from hospital. A growth faltering of 1 SD in 3 months and a Waterlow index  $<-2$  SD were compatible with malnutrition. Recent follow-up was defined as  $<3$  months for children under 2 years,  $<6$  months for children between 2 and 5 years, and  $<1$  year for children older than 6 years. Data was recorded in the e-Pinut internet tool ([www.epinut.fr](http://www.epinut.fr)), allowing the calculation of indices according to French standards.

**Results:** Among the 1385 children included in 48 centers, 671 children (48%), had previous documented growth data. The frequency of malnutrition was 6% at the last known point, 11% at admission ( $p < 10^{-4}$ ). A recent follow-up was present in 76% of cases; 87% for children under 2 years, 69% for children between 2 and 5 years and 64% for children older than 6 years ( $p < 10^{-4}$ ), making 37% of the data relevant. Children  $<2$  years and  $\geq 6$  years of age with chronic diseases were more likely to have recent follow-up than children without chronic disease (90% vs. 81%,  $p < 0.05$ , 77% vs. 50%,  $p < 10^{-4}$ ) but not 2 to 5-year-old children. Twenty-eight percent of children had growth faltering before hospitalization. They did not have a different hospital length of stay than other children ( $4.0 \pm 4.0j$  vs  $4.0 \pm 4.3j$ , NS), nor a different frequency of nutritional treatment at admission (14% vs. 16%, NS).

**Conclusions:** In hospitalized children, previous growth data are relevant in only barely 1/3 of cases. Growth charts, a major part of the nutritional assessment, are insufficiently available in hospitalized children, particularly in children  $\geq 6$  years old without chronic pathology. The higher frequency of malnutrition at admission than at the last point of the health record and the high frequency of growth faltering suggest an acute impact of the disease leading to hospitalization.

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#### SUN-PO294

##### EVALUATION OF EATING HABITS OF ADOLESCENTS FROM HIGH-SCHOOLS FROM NORTH-EASTERN PART OF ROMANIA

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**Rationale:** The purpose of the study was to assess the eating habits of some adolescents and, depending on the results, the necessity of an educational program contributing to significant health benefits.

**Methods:** The study developed between January 2016 and December 2017 included 1320 adolescents from 4 high-schools. The adolescents completed a questionnaire about nutritional status and eating habits. The data were code and entered into the EXCEL<sup>®</sup> program and then exported to the statistical application. The analyses were performed

using IBM SPSS version 18. Statistically values with a p-value  $<0.05$  were considered significant, thus setting up a level of confidence of 95%.

**Results:** Only 9.07% of adolescents were overweight or obese. Breakfast was the most skipped meal. The most adolescents (63.56%) consuming 3–4 meals/day. 77.8% consumed a maximum of 3 servings of whole grains/day, 4.6% consumed more than 6 servings/day of refined cereals, but there were no statistically significant differences in the relationship between BMI and the number of portions of refined cereals consumed. 39.31% consumed less than 2 servings of fruits/day, and 32.90% consumed more than 3 servings of sweets daily. 9.77% did not consume dairy at all or very rarely. The study of the relationship between meat consumption and sweets revealed statistically significant differences in the fact that both girls and boys who consumed more meat consumed even more sweets ( $p=0.00$ ). 16% consumed daily at least 3 servings of fat foods. 37.87% consumed caffeine products at least once a week and 5.68% consumed over 2 daily alcoholic beverages.

**Conclusions:** Taking into account the results obtained, it is necessary to develop a nutritional education program to improve nutritional knowledge and to make future healthy food choices.

**Disclosure of Interest:** None declared.

#### SUN-PO295

##### ACHIEVING ENTERAL AUTONOMY IN CHILDREN WITH INTESTINAL FAILURE: LACK OF CORRELATION BETWEEN CLINICAL AND MORPHOLOGICAL PRESENTATION

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**Rationale:** The aim is to demonstrate the lack of correlation between clinical and morphological presentation of intestinal adaptation and the achievement of enteral autonomy

**Methods:** Short bowel syndrome (SBS) and gastrointestinal neuromuscular diseases (GINMDs) are the most frequent causes of chronic intestinal failure (IF) in children.

58 patients with SBS and 44 children with GINMDs aged 1 months to 17 years have been treated in the department of Pediatric Surgery at Russian Children's Clinical Hospital. We have a wide range of non-transplant treatment options: home parenteral nutrition (HPN) program, autologous intestinal reconstructions, drug therapy enhancing intestinal absorption (teduglutide). Enteral nutrition of children of the first year of life is carried out with breast milk or oligomeric nutrient formulas. In some SBS patients and children with CIPO, we apply night feeding via gastrostomy tube. The introduction of complementary foods begins at 4 months of age which prevents the formation of eating disorders.

Evaluation of jejunal biopsies for morphological signs of intestinal adaptation has been performed in all cases which included villi height, crypt depth and intracellular mitosis.

**Results:** Fourteen SBS children remain off PN 32 months after STEP procedure; nineteen children after intestinal reconstructions continue to receive reduced PN 2–4 nights a week – all with reassuring growth and nutritional status. Teduglutide therapy in 5 SBS patients allowed to increase enteral tolerance and reduce in PN by 50% within 12 weeks. 23% patients with GINMDs, (but not CIPO), achieved enteral autonomy. Based on morphological evaluation we have not noted a correlation

between the described morphological changes and clinical signs of the degree of enteral tolerance.

**Conclusions:** Up to date the assessment of intestinal adaptation has been based mainly on clinical signs such as volume and frequency of stools, urine output and preservation of nutritional status during the reduction of PN. Morphometric criteria of intestinal adaptation such as villi lengthening and crypt deepening do not directly correlate with the severity of enteral autonomy. More studies are needed to investigate specific markers of intestinal adaptation to be able to work out personalized nutritional strategies.

**Disclosure of Interest:** None declared.

#### SUN-PO296

##### PAEDIATRIC PARENTERAL NUTRITION COMPLIANCE: A SIMULATED COMPARISON BETWEEN THE OLD (2005) VERSUS THE NEW (2018) ESPEN/ESPGHAN/ESPR/CSPEN GUIDELINES

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**Rationale:** With the advent of the new 2018 guidelines on pediatric parenteral nutrition (PPN), there is an important shift towards infusing less carbohydrates, with the aim of reducing related hyperglycemia, hepatic problems and mortality. Therefore we decided to retrospectively evaluate PPN policy in our hospital, to see how our local nutritional policy and choice of needed PPN infusions should be adapted accordingly.

**Methods:** Setting: 750-bed tertiary care hospital in Belgium. All PPN therapies between 2015 and 2018 from patients >6 months and <18y, hospitalized on a pediatric unit were included in our study. For each patient, optimal PPN therapy was retrospectively calculated (carbohydrates (CH), lipids, amino acids (AA) and total energy requirement (TER) according both 2005 and 2018 guidelines and compared with the actually administered PPN. TER was calculated according the Schofield formula. A difference below 10% between theoretical and prescribed values was considered compliant. For pharmacy compounded mixtures (PCM), physicians used specific software (Nutriscript®) to calculate required nutrients, accounting for most recent recommendations. All other ready-to-use (RTU) mixtures could be prescribed through the local CPOE system. In order to increase RTU use instead of PCM, all therapies were finally compared against formulations available on the hospital formulary (Olimel® N5+ N7, Smofkabiven® 20GN) or specifically registered for pediatric use (Numetzah® G16 + G19).

**Results:** 113 patients were included, comprising 1671 PPN days (913 PCM, 758 RTU, 658 without lipids). Median patient age was 6.0 years (range 0.5–17.5y). Median PPN duration was 9 days (range 1–69 days). Overall, 52.5% of all patients were evaluated by a dietician. Compliance rates are presented in Table 1. All differences between both guidelines were highly significant ( $p < 0.001$ )

	AA (% compliance)		CH (% compliance)		Lipids (% compliance)	TER (% compliance)	
	2005	2018	2005	2018	2005 & 2018	2005	2018
All	70%	58	86	58	75	34	71
RTU	65	44	86	61	83	43	71
PCM	73	67	86	56	69	27	73

Regarding CH, there is an important decrease in compliance if the new guidelines are applied, resulting in 41% of all prescriptions being overdosed on CH. Equally there is a decrease in AA compliance with

32% being overdosed, especially for the RTU (42% overdosed). In contrast, TER compliance showed a high increase with in total only 16% exceeding calculated energy needs, although for PCM this still amounted to 23% requiring some adjustments of the Nutriscript® system. All For lipids, no changes were made between the 2005 and 2018 recommendations but overall compliance is good.

For the 0–2 year age group, AA and lipid needs are well covered by Numetzah G16 if prescribed using TER, although CH are often overdosed (3–104%) and volume is often too low (2–45%) necessitating additional dilution with water. Above 2 years, Numetzah G19 showed the highest compliance when body weight remained below 30 kg. Above 30 kg, a better compliance is seen when Olimel N5 would be used, although N7 is suitable in case of high AA need.

**Conclusions:** The introduction of new guidelines on PPN results in significant changes regarding nutrient compliance and a thorough re-evaluation of current practice is recommended. Based on our observations, we have developed a new prescribing algorithm to guide physicians towards more appropriate PPN prescribing.

**References:** ESPGHAN/ESPE/ESPR/CSPEN Guidelines on pediatric parenteral nutrition

**Disclosure of Interest:** None declared.

#### SUN-PO297

##### EFFECTIVENESS OF THE DISCHARGE EDUCATION PROGRAM FOR CHILDREN WITH GASTROSTOMY TUBE ON CAREGIVING BURDEN, KNOWLEDGE, AND ANXIETY LEVEL OF THE MOTHERS

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**Rationale:** The purpose of this pre- and post-training descriptive evaluation study was to investigate the effects of a standardized evidence-based discharge education program prepared for children with gastrostomy tubes on caregivers' knowledge, anxiety levels, and caregiving burden.

**Methods:** This quasi-experimental study was conducted between November 2017 and November 2018 and was carried out to examine the improvement in caregivers and the patient after implementation of standardized evidence-based discharge education. The study employed a pre- and post-training descriptive evaluation. The primary caregivers of children with a gastrostomy tube were ( $n = 30$ ) interviewed on the first day of the education, and a pretest, the Zarit Caregiver Burden Scale, and the State and Trait Anxiety Inventory (STAI) were applied. The designed training was subsequently implemented. The primary caregivers were reinterviewed during the first week and the third month after the education, and the posttest, Zarit Caregiver Burden Scale, and STAI were reapplied. To evaluate the effects of the education on the patient, complications of enteral nutrition experienced during the process were followed in clinical interviews.

**Results:** The study revealed that the knowledge levels of mothers increased in the first week and third month after the training, and their caregiving burden and state-trait anxiety levels decreased significantly. Furthermore, although some complications were observed depending on the enteral nutrition process, it was found that the complications were fewer, and the difference was statistically significant compared with the group that did not receive the standardized evidence-based discharge education program.

**Conclusions:** Families be educated in the hospital environment with the support of the clinical nurse and nutritional team so that they can learn the steps of enteral nutrition and how to manage complications. Standardized education program can be recommended because caregivers manage home care process more successfully and



that their stress, anxiety, and difficulties experienced during care will decrease.

**Disclosure of Interest:** None declared.

#### SUN-PO298

### REDUCED SALT CONTENT OF SCHOOL RESTAURANT LUNCHESES THROUGH COORDINATED INTERVENTIONS BY A HEALTH NETWORK, WITH KITCHEN STAFF AND INDUSTRIAL FOOD SUPPLIERS

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**Rationale:** Reduced salt consumption in children has a positive effect on blood pressure, and can induce a decrease in sugary drinks, so can affect weight. For French National Health Program, the average salt consumption target is 6.5 g NaCl /d in child, i.e. 2.6 g for lunch. For prevention purposes, the City of Limoges wanted with the support of the Regional Health Agency (RHA) to test if a reduction of at least 20% of the salt load of lunches of 3 school restaurants was possible.

**Methods:** 1st step: 3 restaurants representative of the city's 17 school restaurants were selected. The chosen effector was the network RHA Limousin nutrition (LINUT), specialized in Nutrition and authorized to carry out training and audits. For the 3 restaurants and 3 consecutive days, the salt content of maternal and primary classes' identical meals was measured. Results were reported to values recommended by the French Collective Restoration and Nutrition Market Review Group.

2<sup>nd</sup> step: cooking and service staff of all restaurants had 28 h training, and 10 points for possible improvement were identified with the employees. Suppliers of the saltiest foods were asked to reduce the salt content of their products; the 10 measures were implemented.

3<sup>rd</sup> step: The salt content of lunches was again measured seven months after the initial tests.

Mann–Whitney and Kruskal–Wallis tests were used.

**Results:** Initial measures showed excess salt intake in all schools (3.7 ± 0.2 for nurseries and 5.0 ± 0.2 g NaCl for primary schools, with differences between the schools;  $p = 0.002$ ). 82–88% of personnel expected to attend training were present. Suppliers responded to requests by delivering less salty foods in four cases on five of the most initial salty ones (including bread) ( $p = 0.04$  to  $0.02$  compared to initial salt concentrations). At the final tests, salt content was close to the recommended values (2.5 ± 0.4 for nurseries; reduction: 32.4%, and 3.4 ± 0.5 g NaCl for primary schools; reduction: 32.0%), and lower than initial values ( $p = 0.0001$ ).

**Conclusions:** This preventive action made possible to highly reduce the salt content of lunch in the school restaurants studied beyond the initial objective. This is the first time that such an action is described, involving the kitchen staff and the food industrialists.

**Disclosure of Interest:** None declared.

#### SUN-PO299

### IRISH DIETITIANS' ATTITUDES AND EXPERIENCES OF BLENDED TUBE FEEDING IN PAEDIATRICS

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**Rationale:** Blended tube feeding (BTF) describes the provision of whole foods blended to a smooth puréed consistency for bolus (i.e. non-pump driven) administration through a feeding tube. While there is growing international data on BTF, Irish data is lacking. Anecdotal evidence from Irish clinicians suggests that BTF is being used as an alternative or to supplement commercial nutritional feeds among some paediatric patients and their caregivers. This study examined: a) the number of Irish registered dietitians (RDs) in both acute and community settings who currently support blended tube feeding (BTF) in the home environment and what proportion of RDs current caseloads patients using BTF account for; b) the attitudes and experiences of RDs towards BTF use within the paediatric population; c) recommendations on information and future resources required by RDs to support patients choosing BTF.

**Methods:** An online survey was conducted on eighty-two RDs through relevant databases of Irish dietetic professional bodies and Health Service Executive (HSE) working groups. Quantitative data was collected over a four-week period and examined through cross-tabulations and Mann–Whitney U tests. Qualitative analysis was used to categorize free-text responses.

**Results:** Sixty-nine respondents were based in paediatric settings on a full or part time basis and the remainder had an adult only caseload. Over two thirds reported Home Enteral Nutrition (HEN) patients on their caseloads ( $n = 48/69$ , 70%). Over half of RDs with HEN caseloads managed patients choosing to use BTF ( $n = 27/48$ , 56%). The greatest concentration of RDs with both BTF and commercially formula fed patient groups were in tertiary hospitals (HEN;  $n = 20/48$ , 42%, BTF;  $n = 12/27$ , 44%). Almost half of RDs were willing to support patients choosing to use BTF in practice or on a patient case basis ( $n = 36/77$ , 47%). RDs reported that international guidelines were the most used source of information to guide practice ( $n = 40/69$ , 58%). Professional training and workshops were the preferred method of learning ( $n = 60/73$ , 82%) for RDs.

**Conclusions:** The choice to use BTF appears to be common within the HEN paediatric patient cohort. Development of dietetic models of care and resources as well as access to RDs for patients who choose to use BTF are required. Professional guidelines, training and information in the Irish setting are needed to support dietetic practice in this area.

**Disclosure of Interest:** None declared.

#### SUN-PO300

### PARENTERAL NUTRITION INDICATIONS AND USE IN CHILDREN WITH CANCER

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**Rationale:** Children with cancer are a common referral group for parenteral nutrition (PN) however patterns of use in this population are poorly described and published indications for PN in children with cancer are generally non-specific.<sup>1–3</sup> We sought to describe patterns of use, indications and frequency of PN use in children with cancer at a tertiary referral paediatric hospital.

**Methods:** A retrospective chart review of all children with cancer receiving inpatient PN in a tertiary referral paediatric hospital over 12 consecutive months was performed using electronic medical record search and records. Data was summarised using descriptive statistics.

**Results:** PN was prescribed to 88 patients (n=47 haematological cancer) in 111 episodes. Total PN days were 2377, representing 24% of annual inpatient days in children with cancer (excluding day admissions). Primary clinical indications were mucositis (n=44, 40%), feed intolerance (n=32, 29%), post-operative (n=18, 16%) and 'other' (n=17, 15%) [conservative surgical management (n=7); aspiration (n=1); patient/parent refusing nasogastric tube (NGT) or enteral nutrition (n=7); NGT contraindicated (n=2)]. Patients with haematological cancer had longer median episodes (19 vs. 12.5 days) and earlier commencement of PN after diagnosis (50 vs. 80 days) than children with non-haematological cancer. Children with HSCT (n=35, 40%) had longer median episodes than those without HSCT (24 vs. 11 days). 74% of PN episodes longer than 28 days were in children with HSCT (17/23).

**Conclusions:** Inpatient PN use is common in childhood cancer. Common indications are mucositis, feed intolerance, post-operative and conservative surgical management. Patterns of use are influenced by cancer type and treatment modality. Understanding PN demand and use may assist development of specific nutrition support tools to aid appropriate PN prescription, guide resource allocation and support patient counselling.

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**Disclosure of Interest:** None declared.

## Perioperative care I

### SUN-PO301

#### MUSCLE MASS, STRENGTH AND INDEX IN VARIOUS MODELS OF PREOPERATIVE IMMUNONUTRITION IN INVASIVE GASTRIC CANCER PATIENTS

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**Rationale:** The results of surgical treatment of invasive gastric cancer are still not content. Adequate preoperative immunonutrition can contribute to their improvement.

**Methods:** The study involved patients with invasive gastric cancer prepared to surgery. They were fed a natural hospital diet. In addition, each patient received a three-chamber nutritional bag with a capacity of 1206 ml. Patients were randomly divided into three immunonutrition groups. Group I was given an oral glutamine (Resource Glutamine) 2 × 5 g daily. Group II received an oral ω-3 fatty acids (Supportan) in the amount of EPA and DHA 2.8 g daily, and Group III a solution of arginine, ω-3 fatty acids and nucleotides (IMPACT) in the amount of 8.6 g arginine, 2.37 g of ω-3 fatty acids, and 0.86 g of nucleotides per day. Lean body mass, and muscle strength was measured and skeletal

muscle mass and index was calculated twice – before and after immunonutrition.

**Results:** Forty-six patients was enrolled into the study. Eleven patients lost above 10% body weight, on average 17.6%. The average duration of immunonutrition was from 7 to 24 days – on average 12 days. In Group with arginine, ω-3 fatty acids, and nucleotides supplementation the muscle strength improved significantly (p < 0,05). Other parameters did not changed relevantly. In patients with oral glutamine supplementation and ω-3 fatty acids supplementation there was no statistically significant changes in muscle parameters.

**Conclusions:** Immunonutrition based on different models protected against loss of skeletal muscle mass, index, muscle strength and lean body mass, but it did not improve these values. Immunonutrition containing the supply of arginine, ω-3 fatty acids and nucleotides improved muscle strength in patients with gastric cancer.

**Disclosure of Interest:** None declared.

### SUN-PO302

#### ASSOCIATION OF PERIOPERATIVE FASTING TIME WITH THE RISK OF COMPLICATIONS AFTER CARDIAC SURGERY

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**Rationale:** Studies evaluating the fasting time and the occurrence of post-cardiac complications are scarce. It is an area of multiprofessional interest and the results can direct new research.

**Methods:** Observational and Longitudinal study, involving patients submitted to cardiac surgery from a public institution specializing in cardiology care in São Paulo.

**Results:** Sixty patients with a mean age of 62.3 ± 9.24 years of age participated in the study. The mean preoperative fasting time (pre FT) was 13.84 ± 2.08 hours and the perioperative fasting time (peri FT) was 42.49 ± 13.35 hours, patients remained on average in the intensive care unit (ICU) for 74.5 ± 44.10 hours and 11.9 ± 5.26 hospitalized days. There was no association between pre FT and postoperative complications. The peri FT was positively correlated with length of ICU stay (p < 0.01), with orotracheal intubation time (OIT), which is associated with hospitalization time (HT) (p < 0.01). Every 1 hour in fasting increases the risk of chances of postoperative complications by approximately 40% (p 0.008).

**Conclusions:** There is a higher risk of postoperative complications of cardiac surgeries with increased perioperative fasting time, these complications may influence the prolongation of ICU stay and hospitalization.

**Disclosure of Interest:** None declared.

### SUN-PO303

#### ENTERAL NUTRITION TUBE PLACEMENT ASSISTED BY ULTRASONOGRAPHY IN PEDIATRIC PATIENTS AFTER MAJOR ABDOMINAL SURGERY

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**Rationale:** To evaluate the effect of a novel procedure using real-time ultrasonography to assist nasojejunal tube placement at bedside in pediatric patients after major abdominal surgery (MAS).

**Methods:** Single center, prospective descriptive study in a 12-bed surgery intensive care unit of a Vinnitsa regional children hospital. 151

MAS patients were enrolled. The whole procedure of placing nasojejun tube was performed by a single physician, who places nasojejun tube at the bedside and performs ultrasonography to guide the tube positioning. The final nasojejun tube position was confirmed by abdominal radiograph. The successful rate of the procedure as well as the time it took, the time from the decision of enteral feeding to commencement of feeding, and complications were recorded.

**Results:** 157 intubations were performed in 151 patients by using ultrasonography-assisted method at bedside. Nasojejun tubes were successful placed in 129 of 151 patients (85.43%). The average time of successful placement was 23.12±4.84 minutes. The median time between physician's decision for tube placement and feeding initiation was 6.2 (2, 04) hours. No adverse events occurred in all of patients.

**Conclusions:** This novel method of nasojejun tube placement under ultrasound guidance is practical, less time consuming and reliable.

**Disclosure of Interest:** None declared.

#### SUN-PO304

##### EFFECTS OF PREOPERATIVE AND POSTOPERATIVE ENTERAL NUTRITION ON POSTOPERATIVE NUTRITIONAL STATUS AND IMMUNE FUNCTION OF ABDOMINAL SURGERY PEDIATRIC PATIENTS

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**Rationale:** Effects of preoperative one week enteral nutrition (EN) support on the postoperative nutritional status, immune function and inflammatory response of abdominal surgery pediatric patients were investigated.

**Methods:** 202 cases of abdominal surgery pediatric patients were randomly divided into preoperative one week EN group (trial group) and early postoperative EN group (control group), which were continuously treated with EN support until the postoperative 9th day according to different treatment protocols. All the patients were checked for their body weight, skin fold thickness, upper arm circumference, white blood cell count (WBC), albumin (ALB), prealbumin (PA), C-reactive protein (CRP), humoral immunity (IgA, IgG), T cell subsets (CD4, CD8 and CD4/CD8), interleukin-6 (IL-6), tumor necrosis factor- $\alpha$  (TNF- $\alpha$ ), etc. on the preoperative and the postoperative 1st and 10th day, respectively.

**Results:** PA and IgG levels of the experimental group were higher than those of the control group on the postoperative 10th day, whereas IL-6 level of the experimental group was lower than that of the control group.

**Conclusions:** EN support for preoperative abdominal surgery pediatric patients will improve the postoperative nutritional status and immune function, alleviate inflammatory response, and facilitate the recovery of patients.

**Disclosure of Interest:** None declared.

#### SUN-PO305

##### A TRIAL ABOUT SHORT-TERM OUTCOMES OF UNCUT ROUX-EN-Y RECONSTRUCTION FOR EARLY GASTRIC CANCER

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**Rationale:** We conducted a randomized controlled trial to compare the safety and nutritional status between uncut and classic Roux-en-Y reconstruction.

**Methods:** Patients with clinical T1 gastric cancer were prospectively enrolled and underwent laparoscopic distal gastrectomy by either

the uncut Roux-en-Y reconstruction or classic Roux-en-Y reconstruction. Nutritional status was measured by laboratory tests like blood routine and blood chemistry examination and BMI change. HRQOL was evaluated using the European Organization for Research and Treatment of Cancer, Quality of Life Questionnaire -STO22. Laboratory tests, BMI and questionnaires were completed at 3, 6, 9 and 12 months.

**Results:** A total of 89 patients (Uncut RY group, n=49; RY group, n=40) were enrolled between June 2015 and December 2017 and analyzed. These two approaches had no significant difference in operating time, blood loss, and time to recovery. At each time point, no statistically significant differences were observed regarding nutritional status and quality of life (P < 0.05).

**Conclusions:** The study's results were considered to be negative because no benefit of the uncut approach was observed. As a result, we suggested much more conservative opinions on uncut Roux-en-Y reconstruction. However, the number of patients in this study is small and the observation time is short. So we need to carry out multi-center cooperation to include more patients and conduct long-term observation, so as to draw more convincing conclusions.

**Disclosure of Interest:** None declared.

#### SUN-PO306

##### CAUSES AND OUTCOMES OF INTESTINAL FAILURE IN CROHN'S DISEASE: AN 18-YEAR EXPERIENCE FROM A NATIONAL CENTRE

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**Rationale:** Although intestinal failure (IF) is a feared complication in Crohn's disease (CD), direct causes and outcomes of this complication have not been well described.

**Methods:** Consecutive patients with CD and IF lasting >12 months and admitted 2000–2018 to a national IF centre were prospectively followed. Data were censored on 31 Jan 2019. Medians (range) are given. Longitudinal data were analysed by the Kaplan-Meier method.

**Results:** 121 patients (67 women) were included. IF occurred 14 (0–50) yrs after CD diagnosis. IF occurred after an operation in 110 (94%) patients, and directly due to disease activity in 11 (9%). Among the 110 patients with postoperative IF, the direct cause was an abdominal septic complication in 60 (55%) (anastomotic dehiscence in 31, enteric fistulation in 24 and intra-abdominal abscess in 5), uncomplicated bowel resection in 37 (34%) and proximal diversion in 13 (12%). 75 (62%) patients did not have their colon in continuity. Of the 31 patients with anastomotic dehiscence, the anastomosis had been formed during an emergency procedure in 11 (35%) and during corticosteroid therapy in 11/19 with data (58%). 29 of the 52 (56%) patients who underwent restorative surgery regained nutritional autonomy, as did 8 of the 69 patients (12%) who did not. On Kaplan-Meier analysis, 42% of all patients had regained nutritional autonomy after 11 years.

**Conclusions:** IF is a severe complication of CD, with less than half referred to a national centre regaining nutritional autonomy. The most frequent cause was a postoperative septic complication following abdominal surgery, in many cases following anastomosis in the presence of risk factors. Preservation of the colon and improved management of perioperative risk factors associated with abdominal septic complications may reduce the incidence of IF in CD.

**Disclosure of Interest:** None declared.



**SUN-PO307****EFFECT OF HOME ENTERAL NUTRITION SUPPORT IN PATIENTS WITH REFRACTORY CONSTIPATION AFTER JINLING PROCEDURE**

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**Rationale:** Constipation is a common problem. Surgery is indicated for chronic constipation refractory to the conservative therapy. To investigate the feasibility and effect of home enteral nutrition(HEN) support in patients after Jinling procedure (subtotal colectomy and side to side cecorectal anastomosis) for refractory constipation.

**Methods:** From July 2017 to December 2018, 107 patients with refractory constipation after Jinling procedure and had nutritional risk at discharge were collected and randomly subjected into HEN group (n=55) and control group (n=52). After discharge, the intervention group received whole-protein enteral nutrition by nasointestinal tube placed in the proximal jejunum on the basis of regular diet, and the control group took only regular diet. Body weight, laboratory serum nutritional indicators, clinical indexes between two groups after discharge were compared.

**Results:** As compared to control group, the levels of body weight(8 weeks 56.24±3.48 vs. 52.46±2.17), total plasma protein(8 weeks 72.03±3.66 vs. 68.98±3.9), albumin(8 weeks 41.75±3.04 vs. 38.45±2.37) and pre-albumin(8 weeks 199.20±18.02 vs. 190.24±13.65) were significantly higher in HEN group on the 2 weeks, 4weeks, 8 weeks after discharge(P<0.05). HEN group also showed significant elevation of stool consistency score(4.9±1.3 vs. 5.6±1.1) and fewer diarrhea(24.5% vs. 36.4%) and abdominal discomfort events (17.6% vs. 31.4%) included venting, nausea, abdominal pain, etc.) (P<0.05). However, there were no statistical significant differences in constipation clinical cure rate(96.7% vs. 95.3%) between the two groups (P>0.05). HEN group had more nasointestinal tube related respiratory difficulty occurrence rate(65.0% vs. 0%).

**Conclusions:** HEN can improve nutritional status and gastrointestinal function, and therefore accelerate the postoperative recovery in patients undergoing Jinling procedure. Nasointestinal tube related adverse events should be avoided.

**Disclosure of Interest:** None declared.

**SUN-PO308****CLINICAL IMPACT OF PREOPERATIVE SARCOPENIA ON POSTOPERATIVE NUTRITIONAL STATUS IN PATIENTS WITH HEPATOBILIARY AND PANCREAS MALIGNANCY**

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**Rationale:** Recently, several studies have reported that preoperative sarcopenia could worsen postoperative complications in patients with various types of periampullary malignancy. The purpose of this study is to compare preoperative and postoperative changes between a sarcopenia patient group and a normal patient group after pancreatoduodenectomy (PD).

**Methods:** From 2015 to 2016, a total of 434 patients who underwent PD with periampullary malignancy at 4 centres was included and

analysed retrospectively. Sarcopenia was defined based on third lumbar vertebra (L3) muscle index. The L3 muscle index was calculated from cross-sectional visceral fat and muscle area on preoperative CT imaging at the third lumbar vertebra level and normalized for height by an automatic calculation program in Matlab version R2010a (Mathworks Inc., Natick, MA, USA). The preoperative patient data were compared to postoperative 6-month values.

**Results:** Preoperative sarcopenia was present in 176 of the patients. In the postoperative weight comparisons, the sarcopenia patient group had a greater body weight change than the normal patient group, but the difference was not statistically significant. There was no difference in BMI change between the two groups. The differences in albumin and cholesterol were greater in the normal patient group, but the difference was not statistically significant.

**Conclusions:** There was no statistically significant difference in body weight, BMI, or albumin and cholesterol levels between the normal patient group and the sarcopenia patient group. Further evaluation is needed in the future.

**Disclosure of Interest:** None declared.

**SUN-PO309****MALNUTRITION IN BILIOPANCREATIC MALIGNANCY: MULTIMODAL SUPPORT (NUTRITIONAL-DIGESTIVE-METABOLIC)**

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**Rationale:** Patients undergoing pancreatotomy requires multimodal support (nutritional-digestive-metabolic) to ensure proper approach, because of their nutritional deterioration, development of exocrine pancreatic insufficiency and diabetes.

The aim of this study is to evaluate the evolution of a group of patients included in a medical-surgical protocol for patient care after pancreatotomy.

**Methods:** Data from 56 patients with pancreatic surgery from 2013 to 2018 were evaluated. We analyzed demographic and clinical-analytic data. Nutritional status between the preoperative period (M0) and the immediate postoperative period (M1), M1 and 3–6 months after surgery (M2) and M2 and a year after surgery (M3) was compared.

**Results:** 56 patients: 57.1% men, mean age 64.4±8.5 years. Tobacco and alcohol use: 50.9% no, 5.5% alcohol, 29% tobacco, 14.5% alcohol and tobacco. 26.8% type 2 diabetes mellitus. Other comorbidities: 61.8% no, 23.6% 2 comorbidities, 14.5% over 2 comorbidities.

	M0	M1	p	M2	p	M3	p
BMI (kg/m <sup>2</sup> )	27.5 ± 4.21	24.6 ± 4.1	0.000	23.9 ± 3.9	0.894	23.7 ± 3.8	0.106
Fat free mass (%)	-	75.7 ± 7.4	-	74.8 ± 8.1	0.359	74.2 ± 8.2	0.117
Albumin (g/dl)	3.2 ± 0.6	2.5 ± 0.7	0.000	3.6 ± 0.3	0.000	3.7 ± 0.3	0.295
Prealbumin (mg/dl)	17.8 ± 6.7	13.5 ± 7.3	0.026	20.9 ± 6.6	0.000	21.7 ± 6.2	0.800
CRP (mg/dl)	25.1 ± 35.7	109.5 ± 108.4	0.000	9.1 ± 12.5	0.000	4.6 ± 3.8	0.230
SGA (%)			0.000		0.000		0.336
Well nourished	61.8	7.8		56.1		72.7	
Risk of malnutrition							
Obvious signs of malnutrition	27.3	29.4		24.4		15.2	
	10.9	62.7		19.5		12.1	

Histopathological diagnosis: 75% adenocarcinoma, 7.1% neuroendocrine tumors, 17.9% others. 36.4% presented post-operative complications, 12.5% required new surgery and 8.9% hospital readmission.

Nutritional status evolution (table 1): Patients lost weight significantly in M1 and then they maintained it, preserving fat-free mass. Despite a significant decline in albumin and prealbumin levels in M1, then

they increased, being in M3 better than in M0. Consequently, the prevalence of malnutrition, according to SGA (subjective global assessment), increased significantly in M1, but then the situation improved with a higher percentage of well-nourished in M3 vs M0. Nutritional supplements use: in M0 17.9% of patients (925 ± 298.6 kcal; 50.6 ± 10.3 gr of proteins); in M1 67.9% (596 ± 157.5 kcal; 30.8 ± 9.2 gr proteins); in M2 35.2% (588.8 ± 188.3 kcal; 33.5 ± 9.7 gr proteins); M3 39.4% (674.8 ± 161.5 kcal; 29.5 ± 15.7 gr proteins). All patients used pancreatic enzymes replacement therapy (dose in gr): 165930.2 ± 44404.2 M1; 193382.3 ± 44085.3 M2 and 194482.7 ± 53674.7 M3.

#### Conclusions:

- Significant deterioration of nutritional status in patients after pancreatectomy, with improvement in M2 regarding albumin and prealbumin and maintenance in M3.
- Although weight is not recovered, fat-free mass is preserved.
- More than 1/2 of patients in M1 and more than 1/3 in M2 and M3 required nutritional supplements
- 100% of patients received pancreatic enzymes replacement, with increasing dose.

**Disclosure of Interest:** None declared.

#### SUN-PO310

##### A RANDOMIZED CONTROLLED CLINICAL TRIAL OF PRE- AND POSTOPERATIVE SUPPLEMENTATION WITH ZINC, VITAMIN C, ARGININE AND MULTIVITAMIN IN PATIENTS OPERATED FOR HEAD AND NECK CANCER

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**Rationale:** Nutritional supplementation may potentially have a beneficial effect on wound healing after surgery, but evidence is lacking.

We wanted to investigate the effect on wound healing of a combined pre- and postoperative oral dietary supplement consisting of 14 g arginine, 63 mg zinc and 1090 mg vitamin-C and two multivitamin tablets daily, as a supplement to adequate nutrition in patients operated on for head and neck cancer.

**Methods:** 42 patients operated for cancer or strong suspicion of cancer in the head and neck region. Randomized to the intervention group (n = 22) or control group (n = 20). Both groups were given supplementary protein drinks with 20 g protein /pcs. The patients were included -7 to -1 days preoperatively, and completed the trial 28 days postoperatively. Evaluation of the scar was based on the Patient and Observer Scar Assessment Scale (POSAS) on day 14 and 28. Biochemical and clinical measurements were performed at baseline, 14 and 28 days postoperatively.

**Results:** The intervention group scored significantly lower than the control group in question; 1 (p = 0,021), 2 (p = 0,026) and 7 (p = 0,033) in POSAS. Significant differences were found between the groups for p-cobalamin (p = 0,003), p-albumin (p = 0,035), p-creatinine (baseline, p = 0,013) (day 28, p = 0,021) and p-carbamide (day 14, p = 0,008) (day 28, p = 0,001).

**Conclusions:** It can be concluded that significant improvement is seen in the intervention group in relation to pain, itching and overall assessment of the scar during the intervention period. However, no significant difference was found between the groups based on the observers' assessment. Significant differences were found in several biomarkers, but it is unclear whether these findings are clinically relevant.

**References:** MEDTRITION is acknowledged for providing ARGIMENT, JEMOPHARM for providing VitaCare Multivitamins, and NATUR DROGRIET for providing Zinc and Vitamine C tablets

**Disclosure of Interest:** None declared.

#### SUN-PO311

##### OUTCOMES IN SURGERY FOR INFLAMMATORY BOWEL DISEASE VS ADENOCARCINOMA IN AN ENHANCED-RECOVERY PROGRAMME: A STUDY IN 1,195 CONSECUTIVE PATIENTS

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**Rationale:** Abdominal surgery for inflammatory bowel disease (IBD) has been associated with more morbidity and slower recovery than surgery for adenocarcinoma. We hypothesised that within enhanced recovery after surgery (ERAS), outcomes are similar between these two major diagnostic groups.

**Methods:** Consecutive patients undergoing elective major abdominal surgery for IBD or primary colorectal adenocarcinoma within an ERAS programme 2011–2018 were prospectively studied using an international perioperative registry. Effects of diagnosis on ERAS compliance, 30-day overall morbidity and length of stay (LOS) were assessed using univariable and multivariable regression. Means (SEM) and medians (range) reported.

**Results:** 186 patients underwent surgery for IBD and 1,009 for adenocarcinoma. IBD patients were younger, 49.0 (0.9) vs 69.5 (0.4) yrs (P < 0.0001); had more minimally invasive operations, 62.9 vs 46.3% (P < 0.0001); had less pelvic operations, 24.2 vs 37.0% (P = 0.0006); and received less intravenous fluid on the day of surgery, 44.8 (2.0) vs 54.4 (0.9) ml/kg (P < 0.0001). Overall ERAS compliance was marginally higher, 69.4 (1.0) vs 67.2 (0.4)% (P = 0.045), but morbidity, 22.6 vs 29.3% (P = 0.060), and LOS, 6 (2–42) vs 6 (1–53) nights (P = 0.081) were similar between groups. On multivariable analysis including confounders, diagnostic group was not associated with morbidity and LOS (P = 0.34 and 0.90, respectively).

**Conclusions:** In this large, consecutive single-centre series, patients with IBD had similar compliance and outcomes to patients with adenocarcinoma.

**Disclosure of Interest:** None declared.

#### SUN-PO312

##### CARBOHYDRATE LOADING: IMPACT ON SURGICAL PATIENTS

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**Rationale:** This study aims to analyze the effects of the carbohydrate loading in surgical patients performed surgeries at the Hospital Rede D'Or São Luiz Villa Lobos Unit – São Paulo.

**Methods:** A clear liquid with carbohydrate and protein was sent to the patients: when the surgery takes place in the morning, a fat supplement was delivered at 23 hours the previous day. Those who had surgery in the afternoon were given a fat-free supplement up to four hours before surgery.

**Results:** A total of 5319 patients hospitalized for elective surgery (orthopedics, urology, general surgery, vascular, gynecology, neurology, plastic surgery, otorhinolaryngology) were evaluated. The fasting of 449 patients (8% of the total surgical patients) was shortened. The total length of hospital stay in patients not fasting (n = 4870) was 4,242 ± 20,10 days (CI95% 3,678–4,807) versus

2,573 ± 1,578 days (CI95% 2,390–2,683) of those patients (n = 449) whose protocol was applied (P < 0.0001). Regarding hospital costs, we found a significant association between the shorter hospitalization time (mean time of 4,095 ± 16,60) and lower hospital costs (mean of € 5,459) for the Spearman correlation (P < 0.0001). The mean hospital costs among the group of fasting patients was € 3,484 ± 5,132 (CI95% 2,968–4,000) and mean length of stay of 2,629 ± 1,626 days (CI95% 2,466–2,793) versus € 5,658 ± 4,575 (CI95% 5,002–6,314) and the time of permanence of 4,243 ± 17,41 days (CI95% 3,689–4,798) of the patients that fasting was not abbreviated, showing reduction of approximately 24% in the total costs of the surgeries and one day of hospitalization. Patients with fasting ≥ 11.5 hours were 164 times more likely to present nausea and/or vomiting.

**Conclusions:** Therefore, the abbreviation of fasting is safe, it is possible to reduce length of stay in one day and hospital costs by approximately 24%, to prevent nausea, vomiting and complications.

#### Reference

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**Disclosure of Interest:** None declared.

#### SUN-PO313

##### ASSESSMENT OF EFFICIENCY OF IMMUNONUTRITIVE SUPPORT IN CONTROL OF SYSTEMIC INFLAMMATION AFTER GASTRECTOMY

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**Rationale:** High-volume oncosurgery is followed by development of the systemic inflammatory response syndrome (SIRS) underlying local and systemic complications. To assess the effect of fat emulsions with  $\omega$ -3 fatty acids on the severity of postoperative systemic inflammation, this study was undertaken.

**Methods:** The prospective comparative research included 53 patients of both sexes (57.2 ± 6 years) after open or laparoscopic gastrectomy D2+. Within 4 days after surgery in group A of 29 patients parenteral administration of Nutriflex 70/240 in combination with a fatty emulsion with  $\omega$ -3 fatty acids (Lipoplus 20), in group B of 24 patients parenteral administration of Nutriflex Lipid 70/180 were carried out. In both groups cytokines TNF- $\alpha$ , IL-6 and IL-4 concentration in peripheral blood was investigated in 2, 5 and 8 days after surgery. Comparison of quantity of local and systemic postoperative complications between both groups was carried out.

**Results:** In group A TNF- $\alpha$ , IL-6 and IL-4 level in all cases authentically (p < 0.01) below, than at the patients group B on 2–5–8th day, pg/ml (for TNF- $\alpha$ : 2.1 ± 0.5–1.8 ± 0.1–1.2 ± 0.3 vs. 3.9 ± 1.2–2.6 ± 1.3–2.1 ± 0.4; for IL-6: 67.1 ± 4.2–44.1 ± 5.1–35.1 ± 4.6 vs. 109.2 ± 7.1–71.4 ± 8.3–52.6 ± 1.2; for IL-4: 2.3 ± 0.9–2.5 ± 0.1–2.1 ± 0.3 vs. 4.9 ± 1.3–4.1 ± 0.6–3.2 ± 1.1 respectively). The share of patients with local and system complications in the group A was authentically below, than in the group B: 5.2% vs. 7.2% (p < 0.05) and 5.2% vs. 14.2% (p < 0.01).

**Conclusions:** The decrease in plasma concentration of TNF- $\alpha$ , IL-6 and IL-4 cytokines revealed in this study confirmed the fact of decrease in expressiveness of SIRS in response to a surgical trauma. Clinical confirmation of efficiency of  $\omega$ -3 fatty acids was the reduction of local and systemic postoperative complications.

**Disclosure of Interest:** None declared.

#### SUN-PO314

##### INTESTINAL FAILURE (IF) AFTER BARIATRIC SURGERY, REPORT OF A SERIES OF PATIENTS SEEN AT A SINGLE CENTER IN ARGENTINA

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**Rationale:** Bariatric surgery (BS) has become an established treatment for severe obesity. Although, complications medical and surgical complications have been reported, there is sub-registry and communication of the number of patients ending with IF after bariatric surgery. Our aim is to report a case series of patients with IF as a result of BS complication, seen at an IF, rehabilitation and intestinal transplantation program.

**Methods:** A retrospective analysis of a prospective IF database was done to determinate the type of BS, demographic data, type of complications and outcomes

**Results:** From a database of 275 IF patients, 13 pts had IF after BS (8 females, mean age 43.8 years); 11 pts (84%) had IF as a result of surgical complications (3 anastomotic leaks, 2 enterocutaneous fistulae; 2 Petersen's Hernia, other: 4), and 2 pts (16%) developed chronic malabsortive diarrhea as a medical complication. After anatomic and functional evaluation, surgical treatment was proposed to 10 pts: 4 Received CRATGI, 1 received CRATGI with by-pass reversal, 5 other surgical procedures and 2 medical therapy. The mean number of surgical procedures needed to reestablish enteral continuity was: 1.82. Nine pts (69%) recovered intestinal sufficiency (IS), 1 patient (7%) remains in PN, 1 died early after BS with type II IF and 2 were lost of follow-up. The subjective global assessment (SGA) at the time of PN initiation was C in 6 pts (46%), B in 5 pts (38%) and A in 2 pts (15%). Mean time on PN was 270.58 days. The SGA at the last follow-up is: A in 10 pts (77%), B in 2 pts (15.4%) and C in 1 pt (7.7%). At a mean follow up time of 8.29 months, the overall survival of patients currently followed at our center is 90%

**Conclusions:** As obesity is recognized and increasing global health problem and BS has become an accepted and worldwide spread treatment, its complications will appear and should be early recognized in order to minimize the risk of evolving to IF. When IF occurs, patients should be seen and evaluated by an experience intestinal rehabilitation and transplant program in order to maximize the chances to recover IS.

**Disclosure of Interest:** None declared.

## Protein and amino acid metabolism

#### SUN-PO315

##### VALIDATION OF ULTRASOUND MUSCLE THICKNESS IN COMPARISON TO L3 MUSCLE AREA IN COMPUTED TOMOGRAPHY IN 119 NON-ICU PATIENTS: THE PROSPECTIVE USVALID STUDY

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**Rationale:** CT muscle area at the level of the third lumbar vertebra is a gold standard of muscle mass measurement, because it correlates very well with whole body muscle mass. Ultrasound muscle thickness measurement has only shown a weak correlation (r<sup>2</sup> = 0,2) with CT in



ICU patients (1). The objective of the study was to validate ultrasound muscle thickness in comparison to CT in non-ICU patients.

**Methods:** 119 non critically ill patients were recruited after routine abdominal CT scanning. Ultrasound muscle thickness was measured at 2 measuring points on each upper arm and 3 measuring points on each thigh. Mean of upper arm muscle thickness and mean of thigh muscle thickness was calculated. Limb length was measured. Minimal compression was applied during ultrasound measurement. The ultrasound muscle thickness was compared to CT L3 muscle area by regression model. Only statistically significant covariates were retained in the model.

**Results:** 79 men and 40 women were recruited. Median (IQR) age was 61 (47–69) years. Mean thigh and upper arm muscle thickness accounted for 53% of the variation in CT L3 muscle area ( $r^2=0,53$ ). When accounting for sex and weight the coefficient of determination ( $r^2$ ) improved to 0,72 (see Table 1).

**Table 1**  
Multivariable linear regression model for CT L3 muscle area (cm<sup>2</sup>):

	Estimate of CT L3 muscle area (cm <sup>2</sup> )	95% CI of estimate	P
constant	16,2	–1,0 to 33,3	0,06
mean thigh muscle thickness (cm)	11,8	5,4 to 18,2	<0,001
mean upper arm muscle thickness (cm)	12,2	1,0 to 23,3	0,03
men	19,0	12,2 to 25,8	<0,001
women	reference		
weight (kg)	0,6	0,4 to 0,9	<0,001

**Conclusions:** The USVALID ultrasound technique applying minimal compression showed a better correlation between ultrasound muscle thickness and CT L3 muscle area ( $r^2=0,53$ ) than the ultrasound technique of Paris et al. applying maximal compression ( $r^2=0,2$ ) (1). The USVALID ultrasound technique may be used for clinical assessment of muscle mass.

#### Reference

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**Disclosure of Interest:** None declared.

#### SUN-PO316

##### IMPACT OF PROTEIN INTAKE AND HIGH-FAT DIET ON MUSCLE PROTEIN SYNTHESIS AND LIPID INFILTRATION IN RELATION TO AGING IN RATS

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**Rationale:** Ectopic lipid deposition impairs muscle anabolic response especially during aging. We hypothesized that the anabolic efficiency of dietary protein in skeletal muscle might be affected by high-fat diet. The objective of the study was to investigate muscle protein synthesis in response to two levels of protein intake combined to two levels of fat intake.

**Methods:** Two groups of sixty adult and forty-nine old male Wistar rats were randomly divided into four groups: isocaloric standard diet

(12% protein, 14% lipid, as STD12); isocaloric standard (high-protein) diet (25% protein, 14% lipid, STD25); hypercaloric high-fat (normal-protein) diet (12% protein, 45% lipid, HFD12); and hypercaloric high-fat (high-protein) diet (25% protein, 45% lipid, HFD25). The nutritional intervention lasted 10 weeks. The fractional synthesis (FSR) and absolute synthesis rates (ASR) of mixed muscle proteins were calculated using isotopically labelled <sup>13</sup>C-Valine incorporation in tibialis anterior (TA). Muscle lipid content was assessed using chromatography method.

**Results:** Rats in the high-fat diet groups self-limited their food intake, so that energy intake was not different among the groups. Regardless of dietary intervention, TA weight was lower in old groups compared to their adult counterparts (all p values)

**Conclusions:** Aging is characterized by reduced muscle weight despite increased FSR, suggesting specific alterations in the nutritional regulation of muscle protein turnover. In isocaloric conditions, higher protein intake modulates muscle lipid infiltration, without improving age-related anabolic resistance in old rats fed a high-fat diet.

**Disclosure of Interest:** None declared.

#### SUN-PO317

##### EFFECTS OF A BRANCHED-CHAIN AMINO ACIDS-ALANINE-SUPPLEMENTATION INTAKE IN HIGH INTENSITY ENDURANCE CYCLING TESTS

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**Rationale:** Sports nutritional supplements containing branched-chain amino acids (BCAA) are reported to improve psychological and biological aspects connected to central fatigue and performance in endurance exercise. Here we sought to determine, in a randomized double-blind placebo-controlled study, whether the intake of recommended doses of a commercially available BCAA-based supplement affects the rating of perceived exertion (RPE) and performance, at the beginning (1d) and at the end of a 9-weeks (9w) scheduled high intensity interval training.

**Methods:** To this end a high intensity endurance cycling (HIEC) test was developed and used. In parallel with RPE, haematological values (creatinine kinase, alanine, BCAA, tryptophan and glucose levels), diet habits, performance indexes (maximal oxygen consumption – VO<sub>2</sub>max, power at lactate thresholds – WLT1, WLT2 and time to exhaustion – TTE) and training load (Training Impulse – TRIMP), were assessed during the HIEC tests and training period. Serum tryptophan:BCAA ratio, which is considered as a determinant of RPE, was also calculated.

**Results:** Supplement (SU) intake significantly reduced RPE compared to placebo (PL) at 1d and 9w; at 9w, prolonged supplement intake improved also TTE and TRIMP. SU consumption promoted a rapid increase (within 1 h) of BCAA serum blood levels and prevented the post-HIEC tryptophan: BCAA ratio increase found in PL group, at both 1d and 9w. Diet habits of the participants neither differed between groups nor changed over time; no difference in glycemia was found between SU and PL. VO<sub>2</sub>max, WLT1 and WLT2 values ameliorated over time, but were unaffected by supplement intake.

**Conclusions:** On the whole these results suggest that i) the intake of the BCAA-based commercially available supplement used in this study reduces RPE as a result of a better and favourable handling of serum tryptophan:BCAA ratio; ii) over time, reduced RPE allows to sustain higher workloads, leading to increased TRIMP and TTE; iii) HIEC test may represent a valid and sensitive method to quantify the actual efficacy of sports supplements to help training outcomes.

**Disclosure of Interest:** None declared.

### SUN-PO319 THE IMPACT OF AMINOACID KETOANALOGUES ON NUTRITIONAL STATUS OF WASTED PERITONEAL DIALYSIS PATIENTS

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**Rationale:** Wasting constitutes a common and severe complication among patients with end-stage renal disease. It is mainly caused by decreased appetite due to uremic intoxication, catabolic processes and dietary restrictions. In patients treated with peritoneal dialysis (PD) protein losses with the dialysate constitute an additional culprit. Supplementation of aminoacid ketoanalogues stands as one of the potential therapeutic options. It helps to diminish the risk of wasting and uremic toxicity without the need of increasing dialysis dose. The aim of the study was to assess the impact of aminoacid ketoanalogues on nutritional status of malnourished PD patients.

**Methods:** The study included 24 PD patients with diagnosed wasting. They were allocated into the interventional or the control group. The intervention was based on aminoacid ketoanalogue supplementation with 9 tablets (Ketosteril®) daily for three months. A number of laboratory and anthropometric indices were monitored. Nutritional status and appetite were assessed with SGA (*Subjective Global Assessment*), NRS 2002 (*Nutritional Risk Score*), and SNAQ (*Short Nutritional Assessment Questionnaire*).

**Results:** In the intervention group, after three months of supplementation, increased values of normalized Protein Catabolic Ratio (nPCR) were noted (0.93 vs 1.14 g/kg/day), while they decreased in the controls (1.13 vs 0.98 g/kg/day). Protein ingestion did not change in any of the groups. In the intervention group, contrary to the controls, lean body mass (LBM) increased, whether expressed as LBM index (14.6 ± 2.5 vs 16.2 ± 3.1 kg/m<sup>2</sup>), or as kilograms (40.6 ± 8.2 vs 44.7 ± 11.0 kg). Following the intervention, nutritional status, as assessed with NRS-2002, significantly improved, as did the appetite. Six patients (55%) failed to fulfil the SGA criteria of wasting, while in controls it was only one subject.

**Conclusions:** Aminoacid ketoanalogue supplementation may improve nutritional status, appetite and LBM in wasted PD patients.

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**Disclosure of Interest:** None declared.

### SUN-PO320 NOVEL IONIC LIQUID CREATINE FORMULATION IMPROVES SKELETAL MUSCLE CREATINE AND STRENGTH PERFORMANCE IN HEALTHY MEN: A PILOT STUDY

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**Rationale:** While creatine monohydrate (CRM) is a well known 'gold standard' among different creatine formulations, its large-scale use remains somewhat limited due to poor solubility in water and limited performance in specific medical conditions. Cholinium-creatinate (CCR), a novel 100% water-soluble ionic liquid creatine formulation, has recently shown superior blood bioavailability as compared to CRM, yet no study so far evaluated its tissue uptake and performance-enhancing effects after short-term supplementation.

**Methods:** Three apparently healthy men (age 24.3 ± 1.8 years; body mass index 23.7 ± 1.2 kg/m<sup>2</sup>) voluntarily participated in this double blind, randomized, cross-over pilot trial. All participants were allocated to receive either 3 grams per day of CCR or CRM for 7 days, with 4-week wash-out period between interventions.

**Results:** CCR intervention resulted in a more potent rise in muscle creatine levels comparing to CRM at 7-day follow-up, as evaluated with 1.5 T MR spectroscopy (5.8 ± 2.9% vs. 3.0 ± 3.7%; *P* < 0.05). CCR was similar to CRM to increase both upper and lower body strength, as evaluated by maximal number of repetitions until volitional fatigue for bench press and leg press exercise. No subjective side effects were reported during each intervention period.

**Conclusions:** CCR appears to be more superior alternative to CRM in terms of tissue uptake while a new experimental treatment is safe and not unacceptably less efficacious than CRM for exercise performance improvement in a small cohort of young healthy men. Long-term well-sampled studies are highly warranted to confirm this preliminary results in both athletic and clinical environment.

**Disclosure of Interest:** S. Ostojic Grant/Research Support from: Serbian Ministry of Education, Science and Technological Development (#175037) and Provincial Secretariat for Higher Education and Scientific Research (# 114-451-710), Other: The author filed a patent application: Sports Supplements Based on Ionic Liquid Creatine at International Bureau of WIPO, Application ID PCT/IB2019/050832, February 13, 2019, M. Vranes Other: The author filed a patent application: Sports Supplements Based on Ionic Liquid Creatine at International Bureau of WIPO, Application ID PCT/IB2019/050832, February 13, 2019, V. Stajer: None declared.

## Hormones, mediators and immunity

### MON-PO323 SUSTAINED ACYLATED GHRELIN TREATMENT LOWERS MITOCHONDRIAL FUNCTION AND INSULIN SIGNALLING IN RAT ADIPOSE TISSUE

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**Rationale:** Acylated ghrelin (AG) is a gastric orexigenic hormone which plays a relevant role in the regulation of intermediate metabolism, with tissue specific effects. In skeletal muscle AG reportedly enhances mitochondrial function and insulin signalling, with variable effect in reducing tissue inflammation and redox balance, both in vitro and in healthy and diseased rodent models. In liver samples AG limits fat accumulation and reduces insulin signalling with no changes in mitochondrial function while improving redox state and gluconeogenesis. AG effects on adipose tissue metabolism are currently largely undefined.

**Methods:** We investigated the impact of AG s.c. administration for four days in 12-week-old male healthy Wistar rats (AGT; n = 8) by twice-a-day 200 ng s.c. non orexigenic hormone injection compared to vehicle (Con; n = 8) on retroperitoneal adipose tissue (AT) mitochondrial enzyme activities (citrate synthase and cytochrome c oxidase), oxidized/total

glutathione, cytokine levels (xMAP) and insulin sensitivity in terms of AKT and GSK activating phosphorylation (western blot).

**Results:** No statistically significant differences were observed among between groups in cumulative food intake or body weight. Compared to Con, AGT had lower ( $p < 0.05$ ) mitochondrial enzyme activities, with similar ( $p = \text{NS}$ ) inflammatory cytokine profile and redox state. Insulin signalling activation was lower in AGT at AKT level ( $P < 0.05$ ), with similar trend at GSK ( $p = 0.08$ ).

**Conclusions:** In rat adipose tissue, sustained acylated ghrelin administration lowers mitochondrial function and insulin sensitivity. These findings are consistent with reports suggesting a potential adaptive role for AG during starvation, as decreased insulin sensitivity and mitochondrial function both lower energy storage by decreasing lipogenesis in adipose tissue.

**Disclosure of Interest:** None declared.

## Qualitative design studies

### MON-PO324

#### COMBATING HOSPITAL MALNUTRITION: DIETITIAN-LED QUALITY IMPROVEMENT INITIATIVE II (DQII)

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**Rationale:** Hospital malnutrition is estimated at least one third of patients in developed countries are malnourished on admission to the hospital, and if left untreated, approximately two thirds of those patients will experience a further decline in their nutrition status during their hospitalization. Hence, dietitian driven continuous nutrition improvement initiative is vital. This study aimed to understand the nutritional status of a large cohort of hospitalized patients and to audit the effect of our previous phase 1 DQII.

**Methods:** Retrospective cohort study composed by secondary database formed by patients included from January to April'18. Patient's data were retrieved from the new digital dietitian module as part of electronic medical records. Patients' demographics, baseline markers of nutritional status – Subjective Global Assessment (SGA), body mass index (BMI), details of nutritional intervention and clinical outcomes were recorded. Data was analyzed using SPSS 20.0.

**Results:** A total of 4531 patients were included with the mean age of  $55.1 \pm 15.1$ y, comprising of 19% critically ill and the rest were non-critical patients. Out of 4531 patients, 3681 of non-critical patients were included for further analysis with the average BMI of  $25.7 \pm 11.1$  kg/m<sup>2</sup>, 77% were well-nourished and 23% malnourished as per SGA. Majority (98%) of patients were on oral nutrition and 14% of those were prescribed with oral nutritional supplements (ONS). Among the non-critical cohort, 63% had a lesser (<4 days) length of stay (LOS) whereas 23% had LOS between 4–7 days and only 14% stayed >7 days. BMI of <18.5 kg/m<sup>2</sup> and >25 kg/m<sup>2</sup> were associated with increased LOS, which proves both undernutrition and overnutrition are detrimental ( $p = 0.002$ ). A significant decrease in the LOS (<4 days) was observed in 46% of patients on ONS ( $p = 0.000$ ). Likewise moderately malnourished patients who were supplemented had an impact on LOS ( $p = 0.001$ ). ONS helped in lowering the LOS irrespective of the percentage weight loss, which was statistically significant ( $p < 0.01$ ). There was an improvement in the nutritional intervention especially ONS prescription and delivery in DQII-II and decreased length of stay of  $3.75 \pm 4.3$ d from  $6.04 \pm 7.11$ d (Phase-1).

**Conclusions:** Continuous improvement initiatives like digitalization of nutrition care process and regular audits helped improve and sustain clinical nutrition practices.

**Disclosure of Interest:** None declared.

### MON-PO325

#### IBERO-LATIN AMERICAN JOURNALS DEDICATED TO FOOD AND NUTRITION SCIENCES: ARE THEY REACHING AN IMPACT?

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**Rationale:** Publishing of the results of a conducted research is the final step of the scientific activity. Choice of the literary container is determinant for the visibility and the impact of scientific communication. Aim: To describe the state of the Ibero-Latin-American (ILA) journals devoted to publishing contents of the Food and Nutrition Sciences.

**Methods:** Study design: Descriptive. ILA journals specialized in publishing contents of the Food and Nutrition Sciences that were identified in selected literary repositories were described regarding the host country, the Publisher, the number of issues comprising each volume, the adherence to the 'Open Access' declaration, and the 'Article Processing Charges' (APC) canon. Performance of the ILA journals was described using several metrics.

**Results:** There were identified twenty-seven medical journals in 8 different countries. Journals differed regarding the publisher, the number of issues per volume, and adherence to the 'Open Access' declaration. All (but one) of the examined journals accepted original contributions without charging the APC canon. Visibility of ILA journals dedicated to Food and Nutrition Sciences is poor when examined through different performance metrics.

Description	Findings
CiteScore	Issues: 11 0.39 $\pm 0.24$ CiteScore $\geq 0.50$ : 5 <sup>§</sup>
SJR	Issues: 12 0.22 $\pm$ 0.09 SJR $\geq 0.200$ : 7 <sup>§</sup>
h-index	Issues: 12 14.8 $\pm$ 10.9 Índice H $\geq 10$ : 6 <sup>¥</sup>
FI	Issues: 10 0.19 $\pm$ 0.20 FI $\geq 0.14$ : 6 <sup>¥</sup>
h5-index	Issues: 19 10.3 $\pm$ 6.9

SJR: Scopus Journal Rank. FI: Impact Factor.

§Calculated by the authors.

¥Based on the median from the findings.

**Conclusions:** Visibility of ILA journals specialized in publishing contents of the Food, and Nutrition Sciences is weak, and that might explain (at least in part) their insufficient impact. A change of mentality and attitude towards the scientific publication is needed to increase the visibility and, consequently, the impact of the journals dedicated in the ILA area to Food and Nutrition Sciences.

**Disclosure of Interest:** None declared.

### MON-PO326

#### CONSTRUCTING STANDARDIZED NURSING PRACTICE ON KOREAN NUTRITION SUPPORT NURSES

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**Rationale:** At August 1st, 2014 Korea Ministry of Health and Welfare (KMHW) launched legislation for reimbursement for Nutrition Support Team (NST) activities which should be comprised of a professional physician, an educated nurse, an educated pharmacist, and a professional and experienced dietitian. Among NST members, nurses play an important role, however, they are confused because their roles are not established and standardized. The purpose of this study was to construct a standardized nursing practice on Korean nutrition support nurse (NSN) working in hospitals.

**Methods:** A descriptive study design was used. Structured questionnaire was developed by experienced nurses, MSNs, and professors majoring in clinical nutrition. The final version included 6 domains (advanced care, NST, advocate, collaboration, research, management) and 38 activities. Validity of the instrument was tested by five experienced NSNs and a doctor. To confirm nursing practice with 1–7 Likert scale of Korean nutrition support nurse, 101 NSNs were recruited from December, 10 to December, 30, 2018. The collected data were analyzed using SPSS/WIN 17.0.

**Results:** One hundred one Korean NSNs from 39 tertiary hospitals, 41 general hospitals with over 300 beds, and 11 general hospitals with 100–300 beds participated in this study. About 43.6% of the nurses had BSNs and 34.7% had master's degree. Years of nursing experience for the nutrition support team had 2.5(SD: 2.4) years. The mean scores of nursing practice in Korean NSNs were 5.3 (SD: 1.0) in advanced care, 4.8 (SD: 1.6) in NST, 3.7 (SD: 1.2) in advocate, 4.2 (SD: 1.4) in collaboration, 3.8 (SD: 1.4) in research, and 5.0 (SD: 1.3) in management, respectively.

**Conclusions:** The standardized nursing practices of Korean NSNs are useful for the qualitative improvement of clinical nutrition services in hospital. Korean NSNs are prepared to a clinical competence, education of staff, and patients, team coordination, research and quality improvement. NSNs could play a key role in improving the patient outcome in NST. Further, it is needed to develop an education program for nutrition nurse specialist which allows the nurse to be certified with accreditation.

**Disclosure of Interest:** None declared.

#### MON-PO327

### PROFESSIONALS' PERSPECTIVE ON THE TREATMENT OF MALNUTRITION IN OLDER ADULTS DURING HOSPITALISATION AND POST-DISCHARGE

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**Rationale:** Many older adults in hospital and post-discharge are malnourished. The treatment of malnutrition is a multidisciplinary process in which dietary protein intake and physical activity play a key role. To get a complete overview of the current treatment of malnutrition, we performed a qualitative research.

**Methods:** Focus group sessions were organised with Dutch hospital and community dietitians, physiotherapists and nurses. Beforehand an interview guide was made focussing on four main topics in the treatment of malnutrition: the current treatment practice versus the most optimal treatment, multidisciplinary collaboration, patient handovers, and the use of digital support. The sessions continued until information saturation was reached. The focus groups were transcribed verbatim, subsequently coded and analysed using MAXQDA.

**Results:** Eight focus group sessions were held between May and August 2018. The main results show: 1) professionals are unaware of each other's ongoing treatments. They desire more inter- and

multidisciplinary communication and collaboration; 2) patient handovers are often incomplete or missing because of file access problems, a lack of time or failing software; 3) more attention should be paid to inactivity of older adults; 4) new digital support tools can help in the communication between professionals and with patients. However, patient contact remains the most valuable.

**Conclusions:** In the treatment of patients with malnutrition in hospital and post-discharge setting, communication, collaboration, patient handovers and physical inactivity should be improved according to dietitians, physiotherapists and nurses.

**Disclosure of Interest:** None declared.

#### MON-PO328

### THE COGNITIVE, BEHAVIORAL AND EMOTIONAL ASPECTS OF EATING HABITS AND ITS ASSOCIATION WITH IMPULSIVITY, CHRONOTYPE, ANXIETY AND DEPRESSION: A CROSS-SECTIONAL STUDY AMONG UNIVERSITY STUDENTS

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**Rationale:** One of the most prevalent and often ignored form of public health disorder, affecting both developed and developing countries, is obesity. Understanding behavioral issues associated with eating would provide important insight into obesity development and possibly procure ways to prevent its occurrence or to treat it.

This study's objectives were to examine links between cognitive, behavioral and emotional aspects of eating habits and chronotype, impulsivity, anxiety and depression among young adults (university students). To the best of our knowledge, no previous study has assessed these associations.

**Methods:** Our study was a cross-sectional questionnaire-based survey conducted among Lebanese university students (Grand Beirut universities: USJ, Lebanese university, USEK, ALBA, NDU, LAU, SAGESE), from October 2017 till March 2018. Inclusion criteria were: students aged 18 years and above, willing to participate in the study. Exclusion criteria were the presence of any cognitive deficit or other chronic diseases. Students were randomly selected within each university using a random number table to ensure the representativeness of the sample. This random selection was proportional to the number of students in each university. Students selected were approached by two trained research assistants at the end of their courses before leaving the classroom. Out of 580 students approached, 400 agreed to participate.

**Results:** The results of this study showed significant associations between the 3 dimensions of eating habits (cognitive restraint CR, uncontrolled eating UE and emotional eating EE) and BMI. No differences in CR or UE were observed in this study between males and females; only EE was significantly higher among females. Our results also showed that impulsivity was intimately associated to eating habits. In particular, higher sensation seeking was associated to lower CR. Furthermore, higher negative urgency was associated with higher UE and EE. The last factor that remained significantly associated to eating habits in the multivariate analysis was the chronotype; it showed links with CR and UE: morning type individuals had higher CR while evening type individual presented higher UE scores. Our results showed that anxiety and depression scores were not significantly correlated to any of the 3 factors of eating habits;

**Conclusions:** Further studies are needed to estimate how specific facets of sensation seeking and negative urgency interact with chronotype in relation to eating behaviors, and specifically CR and UE. Finally, future studies should replicate findings in samples of individuals with different aspects of eating disorders such as binge eating disorder, bulimia nervosa or food addiction.

**Disclosure of Interest:** None declared.

**MON-PO329****THE FRAGILITY INDEX IN RANDOMIZED CONTROLLED TRIALS IN THE FIELD OF CLINICAL NUTRITION**

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**Rationale:** Recently, a parameter called 'Fragility index' (FI) has been proposed, which measures how many events the statistical significance relies on. The lower the FI the more 'fragile' the results, and thus more care should be taken when interpreting the results. Our aim in this study was to check FI of nutritional trials.

**Methods:** We conducted a systematic review of human clinical nutrition RCTs that report statistically significant dichotomous primary outcomes. We searched the EMBASE, MEDLINE, and Scopus databases. The FI of primary outcomes using the Fisher exact test was calculated and checked the correlations of FI with the number of randomised trials, the p-value of primary outcomes, the publication date, the journal impact factor and the number of patients lost to follow-up.

**Results:** The initial database search revealed 5790 articles, 45 of which were included in qualitative synthesis. The median (IQR) FI for all studies was 1 (1–3). Thirty-two studies (71.1%) had an FI lower or equal to 2, and in 18 articles (40.00%) the FI was lower than the number of patients lost to follow-up. FI has a significant positive correlation with the number of randomised patients ( $p=0.020$ ) and a negative correlation with p-value of primary outcomes ( $p=0.016$ ).

**Conclusions:** The results of RCTs in nutritional research often rely on a small number of events or patients. The number of patients lost to follow-up is frequently higher than the FI calculation.

**Reference**

- Walsh M, Srinathan SK, McAuley DF, et al. (2014) The statistical significance of randomized controlled trial results is frequently fragile: A case for a Fragility Index. *J Clin Epidemiol* 67:622–628. doi: 10.1016/j.jclinepi.2013.10.019

**Disclosure of Interest:** None declared.

**MON-PO330****A LACK OF KNOWLEDGE AND A FEAR OF FOOD TRIGGERS SUFFERING IN PATIENTS WITH A HISTORY OF ACUTE DIVERTICULITIS: AN INTERPRETATIVE PHENOMENOLOGICAL ANALYSIS**

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**Rationale:** The inpatient dietary management for diverticulitis routinely includes dietary restrictions despite a lack of evidence for this approach. There is also a dearth of qualitative research which prevents understanding of the patient experience, a barrier to providing patient-centred care. This study aims to understand the impact of dietary restrictions for the management of acute diverticulitis on patient experience.

**Methods:** Three semi-structured in-depth face to face interviews were conducted with adult patients admitted to a public hospital in South East Queensland, Australia for acute, uncomplicated diverticulitis

treatment. Interviews were analysed following the interpretive phenomenological analysis (IPA) framework.

**Results:** Inter-related themes of *knowledge, control, social stigmatisation, and vulnerability* were found to sit within a broad experience driven by *fear of food and suffering*. Theme interpretation guided the development of a 'diverticulitis fear and suffering framework' which explained a phenomenon experienced by the patients. Sitting in a context of a lack of knowledge by patients, family, and health professionals, food was used as a vehicle of blame and causality for diverticulitis occurrence. 'Fear of food' was a trigger for a cycle, which commences with dietary restrictions and leads to stigma, loss of culture, failure, blame, guilt, vulnerability, and back to a fear of food. With each cycle, fear of food, dietary restrictions, and patient suffering worsen.

**Conclusions:** Considering patient experiences highlights the need for a multidisciplinary collaborative approach to avoid unnecessary dietary restrictions to prevent avoidable suffering by patients. Increased research regarding the dietary management of acute diverticulitis is essential to improve evidence-based practice to improve the quality of life for diverticulitis patients.

**Disclosure of Interest:** None declared.

**Geriatrics II****MON-PO331****CHARACTERIZATION OF BODY COMPOSITION AND HYDRATION STATUS ACCORDING TO AGE'S GROUP AND GENDER IN ELDERLY PEOPLE LIVING IN NURSING HOMES**

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**Rationale:** Body composition and hydration status are highlighted predictors of functionality, nutritional status and adverse outcomes in elderly population. This study aimed to analyse the potential differences in body composition and hydration status according to gender and Age's ranges in older people living in nursing homes.

**Methods:** A multicenter cross-sectional observational study in 229 autonomous elder people (women: 84.4%; aged: 87.5 ± 6.84; time on institutionalization: 3 1.6 ± 28.37 months). Assessment of nutritional status by Mini-nutritional assessment (MNA). Body composition and hydration status was analysed by mono-frequency bioelectrical impedance analysis. The sample was stratified according to recommendations of world health organization (WHO) by gender and Age's ranges into 2 groups (G<sub>n</sub>) (G<sub>1</sub>: aged, 74–85 years) and, (G<sub>2</sub>: aged, >85 years). Statistical analysis by SPSS v.20.

**Results:** Of 250 elders evaluated, 229 (91.6%), were enrolled. The aged distribution (%) was 32.3% (G<sub>1</sub>) and 67.3% (G<sub>2</sub>), women 74.3% and 75.5%, in both Age's ranges groups (G<sub>1</sub>, G<sub>2</sub>), respectively. Age was positively correlated with resistance ( $r=0.19$ ;  $p=0.037$ ) and inversely with body cell mass (BCM, kg) ( $r=-0.24$ ;  $p=0.02$ ) and intracellular water (ICW, L) ( $r=-0.24$ ;  $p=0.02$ ) in both groups. By comparing aged and gender groups, mean differences were found with body weight (BW), resistance, BCM, total body water, ICW, fat mass, lean body mass and fat-free mass (at least,  $p < 0.05$ ). The multivariate analysis adjusted by age and gender showed significantly that BW, mid-arm upper circumference, ICW and resistance (at least,  $p < 0.05$ ) were associated.

**Conclusions:** The evaluation of body composition and hydration status should be analysed by Age's ranges and gender for identifying the potential changes and to promote preventive and/or tailored nutritional intervention in elder people as needed.

**Disclosure of Interest:** None declared.

**MON-PO332****ORAL NUTRITIONAL SUPPLEMENTS AND NUTRITIONAL STATUS EVALUATION IN ELDERLY PATIENTS AFTER HIP FRACTURE: A ONE YEAR RETROSPECTIVE STUDY**

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**Rationale:** Hip fracture is associated with high mortality and malnutrition risk. 2018 ESPEN guideline in geriatrics recommends oral nutritional supplements (ONS) postoperatively. The aim of this study was to evaluate the use of ONS and nutritional status evaluation (NSE) after hip fracture surgery (HFS) at our institution.

**Methods:** Retrospective study of 261 patients >65 years undergoing HFS at our hospital between Jan 2017 and Dec 2017. We collected data of serum albumin (ALB), cholesterol (CHOL) and total protein (TP) measured in the first 2 weeks after HFS. Statistical analysis:  $\chi^2$  and T-test.

**Results:** 59/202 (male/female) patients were included. Age;  $84,6 \pm 7,3$  yrs (65–107). Mortality: Intra-hospital 8,8%; 3 months 13% and 1 yrs postHFS 21,4% (males vs females: 37,2% vs 16,8%;  $\chi^2$  p = 0,001). ONS were prescribed in 22,6% for 6,39  $\pm$  7,6 months (45,7% hyperproteic, 42,4% hyperproteic+vit D, 1,7% hyperproteic+vit D +HMB; 10,2% others). 10 patients were using ONS previously, the rest started within the first postHFS week. All patients had a subjective NSE by a geriatrician and 12,3% had a NSE by an endocrinologist, registered in their clinical history (all initiated ONS). Biochemical data: TP (n = 124)  $5,3 \pm 0,6$  g/dl; CHOL (n = 99)  $146,9 \pm 43,7$  mg/dl, ALB (n = 57)  $2,6 \pm 0,5$  g/dl. In the subgroups 1) ALB < 3,5 g/dl ONS in 53,8% and NSE registered in 32,7%. 2) CHOL < 150 mg/dl ONS in 43,6% and ENS in 32,7%. 3) TP < 6,5 g/dl: 36,2% used ONS and 21,6% had registered NSE. Patients who used ONS were older:  $87,02 \pm 6,3$  vs  $83,8 \pm 4$  yrs (p 0,002). CHOL was lower in those who died within 3 months:  $129,8 \pm 48,4$  vs  $152,1 \pm 42,6$  mg (p < 0,05)

**Conclusions:** ONS were prescribed in a low proportion of patients with HFS at our institution. The proportion increased in malnourished patients according to biochemical data. NSE was a routine nutritional intervention but not registered in many cases.

**Disclosure of Interest:** None declared.

**MON-PO333****ARE ADVANCED GLYCATION END PRODUCT (AGE) LEVELS ASSOCIATED WITH FRAILTY IN DUTCH OLDER ADULTS?**

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**Rationale:** Levels of Advanced Glycation End products (AGEs) increase with age and may contribute to loss of muscle function. Loss of muscle strength and mass are considered indicators of the multidimensional construct of frailty. Until now, it is unclear if the level of AGEs is associated with frailty in older adults. Therefore we studied the association between levels of skin AGEs and frailty in older adults.

**Methods:** Frailty was identified with the Groningen Frailty Indicator (GFI) in community dwelling adults aged  $\geq 55$ y, who participated in the Hanze Health and Ageing Study. GFI scores may range from 0–15 (cut off for frailty  $\geq 4$ ). The autofluorescence value (AU) of skin was

measured with an AGE reader (Diagnoptics). Univariate and multivariate binary logistic regression analyses were performed. Multivariate analysis corrected for age, sex, Caucasian origin, smoking, handgrip strength (handgrip dynamometer; kg) and lean body mass (bio electrical impedance; kg). A p-level of <0.05 was considered significant and Odds Ratios (OR; 95% CI) were presented.

**Results:** 111 participants (age  $64.0 \pm 5.5$ y; male 45.9%; autofluorescence  $2.14 \pm 0.54$  AU; median GFI = 1 [min 0–max 6], frail: n = 21) were included in the analysis. Both in the univariate analysis (p = 0.036, OR = 2.55 [1.07–6.13]) and in the multivariate analysis (p = 0.046, OR = 2.80 [1.02–7.71]), skin autofluorescence was significantly associated with frailty. Other variables were not significantly associated with GFI.

**Conclusions:** In this sample of older adults aged  $\geq 55$ y, the level of skin AGEs shows a borderline significant association with frailty. Further research that includes sub-analysis of AGE levels for the different domains of frailty may provide more insight in this relationship.

**Disclosure of Interest:** None declared.

**MON-PO334****ASSOCIATION BETWEEN (ABDOMINAL) OBESITY AND ADVANCED GLYCATION END PRODUCTS IN DUTCH OLDER ADULTS**

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**Rationale:** (Abdominal) obesity may contribute to the development of insulin resistance. Insulin resistance may contribute to the development of Advanced Glycation End products (AGEs), which may further contribute to the pathogenesis of insulin resistance and of age-related chronic diseases. However, until now it is unclear if abdominal obesity contributes to increased AGE levels. Therefore, we studied the association between measures of (abdominal) obesity and skin AGE levels in older adults.

**Methods:** In this cross-sectional study, the skin autofluorescence value (AU) was measured with an AGE reader (Diagnoptics) in Dutch community dwelling adults aged  $\geq 55$ y. Abdominal obesity was measured by waist circumference (cm). BMI was calculated from body weight and height ( $\text{kg}/\text{m}^2$ ). Data were corrected for outliers, and univariate and multivariate linear regression analyses were performed. Multivariate analysis corrected for age, sex, Caucasian origin, smoking, diabetes type 2, daily physical activity (3-axis accelerometer; METs/day), and lean body mass (bioelectrical impedance analysis; kg). Significance was presumed at p < 0.05 and explained variance ( $r^2$ ) was reported.

**Results:** In total, 85 participants (age  $64.8 \pm 6.0$ y; male 48.2%; waist male  $97.9 \pm 10.0$  cm, waist female  $89.2 \pm 14.5$  cm; BMI  $26.1 \pm 4.1$   $\text{kg}/\text{m}^2$ ; AF  $2.12 \pm 0.47$  AU) were included in the analyses. In the univariate analysis, waist circumference was significantly associated with skin autofluorescence ( $r^2 = 0.05$ , p = 0.032), whereas BMI was not ( $r^2 = 0.02$ , p = 0.205). In the multivariate analysis, waist circumference was not significantly associated with skin autofluorescence (model  $r^2 = 0.20$ ,  $r^2$  change = 0.03, p = 0.096).

**Conclusions:** This study indicates that abdominal obesity only explains about 3–5% of variance in skin AGE level. After correction for co-variables, abdominal obesity was no longer significantly associated with skin AGEs. The weak explained variance in our sample may indicate that the impact of intra-abdominal fat stores on AGE levels could be limited.

**Disclosure of Interest:** None declared.



**MON-PO335****THE GERIATRIC APPROACH TO THE POTENTIAL RISKS OF COPD IN THE ELDERLY PATIENTS WITH TYPE 2 DIABETES COMPARED WITH THE NON-ELDERLY**

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**Rationale:** Type 2 diabetes is considered a common comorbidity for elderly patients with chronic obstructive pulmonary disease (COPD). Both of COPD and type 2 diabetes are serious diseases requiring proper diagnosis and management in geriatric medicine. However, there is little evidence about the prevalence of COPD and the lung function in the elderly patients with type 2 diabetes compared with the non-elderly.

**Methods:** We investigated 246 elderly aged 65 years over and 293 non-elderly patients aged 40–64 diagnosed with type 2 diabetes who had not been diagnosed as respiratory diseases in a diabetes clinic in Japan. They underwent the lung function test including predicted expiratory volume at one second (%FEV1) and FEV1% for assessing the severity of COPD.

**Results:** The prevalence of COPD in our survey was 37.0% in the elderly and 3.1% in the non-elderly patients. In the multivariate analysis the decrease of FEV1.0% was associated with BMI ( $p = 0.004$ ), age ( $p = 0.01$ ) and the presence of insulin use ( $p = 0.003$ ) in the elderly and BMI ( $p = 0.04$ ) and c-peptide ( $p = 0.03$ ) in the no-elderly, respectively. BMI is the common factor for the elderly, which was significantly associated in male. The decrease of %FEV1.0 was associated with the presence of insulin use ( $p = 0.001$ ) and pack year ( $p = 0.01$ ) in the elderly and c-peptide ( $p = 0.02$ ) in the no-elderly, respectively.

**Conclusions:** Our results suggest that there is a potential risk of COPD in elderly patients with type 2 diabetes compared to the non-elderly and lung function test is important for the early detect of COPD in patients with type 2 diabetes. In addition the treatment of type 2 diabetes including the management of low BMI may be effective, especially in the male elderly patients with COPD.

**Disclosure of Interest:** None declared.

**MON-PO336****A SYSTEMATIC REVIEW OF THE EFFECTIVENESS OF NUTRITIONAL INTERVENTIONS PROVIDED BY NON-DIETITIANS ON NUTRITIONAL OUTCOMES IN ADULTS AT RISK OF MALNUTRITION**

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**Rationale:** Whilst dietitians remain uniquely-qualified to provide targeted nutritional interventions, the low numbers of dietitians in relation to patients needing nutritional support means that innovative ways of working are needed. This systematic review aims to describe the nutritional interventions provided to adults at risk of malnutrition, by non-dietetic healthcare professionals, caregivers or volunteers according to setting and mode, and to synthesise their impact on nutritional outcomes.

**Methods:** Seven electronic databases were searched for relevant studies, supplemented by a 'snowball' search. All quantitative study types evaluating the effectiveness of a nutritional intervention in adults at risk of malnutrition across different settings and provided by a non-dietitian were included. Risk of bias was assessed by the Cochrane risk of bias or Robins-I tool.

**Results:** 20 studies met the inclusion criteria. Interventions were provided by nurses ( $n = 9$ ), lay volunteers ( $n = 9$ ) and MDTs ( $n = 2$ ), in a

variety of care settings. The majority were in people aged >65 years ( $n = 17$ ). Nutritional interventions included nutritional advice and counselling ( $n = 10$ ), mealtime feeding assistance ( $n = 9$ ), and changes to dietary intake ( $n = 1$ ). Mixed results were found for changes in energy, protein, and food intake (Table). Studies varied in outcomes reported, measurement methods (e.g. screening tool used), duration (one month–3 years) and study quality.

	Energy Intake	Protein Intake	Food Intake	Weight change	Nutrition Risk Status
Nurses	2(1) <sup>a</sup>	2(1)	3(2)	1(1)	2(2)
Volunteers	3(0)	3(1)	0	0	1(1)
MDTs	1(1)	1(1)	0	0	1(0)

<sup>a</sup>Numbers represent the number of studies (number of studies with a statistically significant benefit in the intervention group).

**Conclusions:** These results suggest improvements in dietary intake, weight change, and nutritional risk in some studies where nurses delivered the intervention. Further research is needed to evaluate which interventions are most effective and the impact of nursing interventions on other patient outcomes e.g. quality of life and functional outcomes. There are insufficient data to evaluate the effectiveness of interventions delivered by volunteers or MDTs.

**Disclosure of Interest:** None declared.

**MON-PO337****REVIEW OF NUTRITIONAL CARE PROVIDED TO OLDER ADULTS IN THE COMMUNITY**

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**Rationale:** Nutritionally vulnerable patients are frequently not recognised early. The number of routine healthcare interactions and the amount and nature of nutritional information provided is not known among these patients. This study aimed to explore interactions between older people and healthcare professionals and to identify the nature of any nutritional care provided.

**Methods:** 99 participants (mean age  $74.5 \pm 8.6$ ) were recruited from different GP settings and information was collected on nutritional risk status. Data were collected from the electronic healthcare records system of three hospitals within one NHS Trust in the UK on participant contact with hospital departments and staff, and documentation of nutritional care for a one-year period. Data were imported into SPSS and summarised using descriptive statistics.

**Results:** At baseline mean BMI was  $26.4 \pm 6.0$  kg/m<sup>2</sup> with seven (7%) of the participants being underweight and ten (10%) reporting weight loss. 71 (72%) had no comorbidities recorded and 11 (11%) were described as frail. Among the 14 (14%) participants who were underweight or reported weight loss ('at risk'), 88% ( $n = 93$ ) of visits were outpatient and 12% ( $n = 13$ ) were inpatient visits at any one of the three hospitals. These participants were seen mainly by physicians ( $n = 58$  times), nurses ( $n = 18$  times), and physiotherapists ( $n = 15$  times). No dietitian contacts were recorded. Of those participants who were at risk ( $n = 14$ ), seven (50%) had no input regarding nutrition documented, four (28%) had BMI recorded, of which majority were during inpatient visits. One (7%) participant was screened using MUST during an inpatient visit by a nurse, four (28%) were assessed nutritionally by a physician and three (21%) were referred to a dietitian. All documentation was provided by non-dietetic professionals (physician or nurse).

**Conclusions:** Despite numerous healthcare contacts, malnutrition remains undetected in the community with numerous missed opportunities during routine healthcare appointments for timely identification and management of malnutrition of at-risk patients. Future research will review nutritional documentation during General Practice visits.

**Disclosure of Interest:** None declared.

#### MON-PO338

##### CT-GUIDED PERCUTANEOUS GASTROSTOMY FOR ELDERLY PATIENTS: A RETROSPECTIVE EVALUATION IN 75 PATIENTS

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**Rationale:** Elderly patients often suffer from dysphagia, painful swallowing, or cough caused by the age-related diseases such as dementia, stroke, Parkinson's syndrome and tumor. Although percutaneous endoscopic gastrostomy (PEG) is the most common method for patients with long-term enteral feeding, it has obvious limitations for patients with severe stenosis of the pharynx or esophagus, and for elderly people at high risk for anesthesia. Then computed tomography (CT)-guided percutaneous gastrostomy may be a safe and effective alternative. The purpose of this study was to assess the effectiveness, complications and quality of life associated with CT-guided percutaneous gastrostomy for elderly patients.

**Methods:** This retrospective study included elderly patients who had undergone CT-guided percutaneous gastrostomy between March 2007 and December 2018. The elderly patients who underwent PEG during the same period were selected as the control group. Information regarding the patients' backgrounds, NRS-2002 scores, Charlson Comorbidity Index, CT-guided percutaneous gastrostomy techniques, technical success rate, and complication were obtained from the medical records. The body mass index (BMI) and laboratory evaluations including albumin and prealbumin were determined before operation and 2 months after operation. The physiological function, psychological health and social function were compared between pre-operation and post-operation using SF-36 quality of life scale.

**Results:** There were 75 elderly patients underwent CT-guided percutaneous gastrostomy, and 86 elderly patients underwent PEG with the success rate of 100% and 96.51%, respectively ( $P > 0.05$ ). In the CT-guided percutaneous gastrostomy group, the average age of patients and Charlson Comorbidity Index were higher than PEG group ( $P < 0.05$ ). There were no significant differences based on BMI, albumin, prealbumin and SF-36 scores between CT-guided percutaneous gastrostomy and PEG group. The overall mean procedure time of CT-guided percutaneous gastrostomy was 40.3 min. No Major complications were observed in those patients underwent CT-guided percutaneous gastrostomy. Minor complications occurred in 5 patients (6.7%), which included peristomal leakage ( $n = 2$ ), irritation ( $n = 1$ ), inadvertent removal ( $n = 1$ ), and peristomal hemorrhage ( $n = 1$ ). BMI, hemoglobin and albumin were significantly improved after operation ( $P < 0.05$ ). Physiological function, psychological health and social function were also significantly improved after operation ( $P < 0.05$ ).

**Conclusions:** Our study suggests that CT-guided percutaneous gastrostomy is a feasible and safe alternative for elderly patients who are unsuitable for PEG.

**Disclosure of Interest:** None declared.

#### MON-PO339

##### SKELETAL MUSCLE ULTRASONOGRAPHY: A NEW DIAGNOSTIC TOOL FOR SARCOPENIC OBESITY?

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**Rationale:** Although different definitions have been proposed, there is no definitive diagnosis of sarcopenic obesity yet. The aim of our study is to evaluate sarcopenic obesity by different diagnostic tools.

**Methods:** Seventy six patients, aged over 65 years, whose body mass index (BMI) was 30 and over were included in the study. All patients underwent comprehensive geriatric assessment, including hand grip strength (HGS) and bioimpedance analysis (BIA). In six different types of muscle [gastrocnemius medialis (GM), rectus femoris (RF), rectus abdominis (RA), external abdominal oblique (EAO), internal abdominal oblique (IAO), transversus abdominis (TA)] ultra-sonographic evaluation of the patients was carried out. The diagnosis of sarcopenic obesity was based on functional sarcopenic obesity definition consisting of both low HGS (Male  $< 27$  kg, Female  $< 16$  kg) and high BMI ( $\geq 30$  kg/m<sup>2</sup>).

**Results:** The median age of the patients was 71 (65–85) years, 80.3% was female and 26.3% ( $n = 20$ ) of the patients were sarcopenic obese. Gender rate was similar between sarcopenic obese and non-sarcopenic obese groups. There was no difference in BIA-derived skeletal muscle mass index (SMI) between two groups ( $p = 0.596$ ). RF and IAO muscle thickness was found to be lower, RF cross sectional area (CSA) smaller and GM fascicle length shorter in sarcopenic obese patients compared to non-sarcopenic obese group ( $p = 0.042$ ,  $p = 0.019$ ,  $p = 0.004$ ,  $p = 0.039$ , respectively). Receiver operating characteristic (ROC) analysis suggested that optimum cut-off point of RF CSA for sarcopenic obesity was  $\leq 4.22$  cm<sup>2</sup> with 76.92% sensitivity, 68.18% specificity, 41.7% positive predictive value and 90.9% negative predictive value (AUC: 0.734,  $p = 0.001$ ).

**Conclusions:** This study demonstrated that ultra-sonographic evaluation of skeletal muscle mass, especially RF CSA, may be more accurate than BIA-derived SMI assessment for the diagnosis of sarcopenic obesity.

**Disclosure of Interest:** None declared.

#### MON-PO340

##### EFFECT OF EARLY GLUCOSE INFUSION ON PLASMA MINERAL LEVELS IN VERY OLD PATIENTS

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**Rationale:** An intake of carbohydrates can stimulate cellular anabolism that leads to transport of electrolytes into the cells and decrease plasma levels – refeeding syndrome. The aim of our study was to assess the glucose effect on plasma mineral changes in acutely ill geriatric patients.

**Methods:** Forty patients (78+ years old) acutely accepted to hospital were subsequently randomised into two groups. Control group received standard rehydration crystalloid therapy, the second group (GLUC) received intravenously 200 g of glucose per day together with rehydration therapy. The patients were carefully monitored and plasma mineral levels were measured during 72 hours. This project

was approved by the local ethical committee and data were analysed statistically.

**Results:** The groups were comparable regarding to number of chronic diagnoses and age ( $86 \pm 4$  years). We observed significant drops in plasma potassium and phosphate levels over first 72 hours of rehydration:

Day	Potassium [mmol/L]		Phosphate [mmol/L]		Magnesium [mmol/L]	
	Control	Gluc	Control	Gluc	Control	Gluc
1	$4.06 \pm 0.45$	$4.12 \pm 0.65$	$0.91 \pm 0.14$	$0.98 \pm 0.25$	$0.71 \pm 0.11$	$0.83 \pm 0.12$
2	$4.17 \pm 0.29$	$3.86 \pm 0.49$	$0.97 \pm 0.13$	$0.86 \pm 0.27$	$0.84 \pm 0.11$	$0.85 \pm 0.09$
3	$4.04 \pm 0.46$	$3.81 \pm 0.34$	$0.96 \pm 0.27$	$0.79 \pm 0.21$	$0.85 \pm 0.07$	$0.89 \pm 0.08$
4	$4.01 \pm 0.41$	$3.8 \pm 0.47$	$0.96 \pm 0.38$	$0.72 \pm 0.19$	$0.79 \pm 0.09$	$0.86 \pm 0.12$

**Conclusions:** Administration of glucose can cause mineral changes that are typical for refeeding syndrome in acutely ill very old patients in early stage of disease. Careful re-alimentation with mineral monitoring is important in this group of patients.

**Acknowledgements:** PROGRESS Q40/12

**Disclosure of Interest:** None declared.

#### MON-PO341

#### FRAIL SCALE AS A NUTRITIONAL SCREENING TOOL IN A COMMUNITY PHARMACY CONTEXT

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**Rationale:** In Portugal, the life expectancy has increased over the years, being nowadays higher than 80 years old. Older age is a risk factor for malnutrition and the evidence also indicates that the sarcopenia and fragility prevalences are higher in people over 65 y.o. The nutritional status and frailty's evaluation are essential to establish preventive and therapeutic measures.

The present study aims to:

- Evaluate the prevalence of frailty risk in people over 65 y.o. who participated in the nutritional screening, conducted in community pharmacies;
- Identify situations of pre-frailty and frailty.

**Methods:** A cross-sectional observational study was carried out for elderly people (age  $\geq 65$  yo) through a nutritional screening conducted in 55 community pharmacies.

Weight and Body Mass Index (BMI) were measured using Omron BF511<sup>®</sup> scale and registered with patient informed consent. The frailty was evaluated with the FRAIL questionnaire screening tool that consider 5 categories: fatigue, resistance, locomotion, illnesses and weight loss.

**Results:** Between October and December 2018, 243 elderly people, with a mean age of  $75.1 \pm 6.6$  were evaluated, the majority of which were female (75.3% (n = 183)). The prevalences of low weight (IMC < 22 Kg/m<sup>2</sup>) and overweight (IMC > 27 Kg/m<sup>2</sup>) were 10.7% (n = 26) and 53.5% (n = 130) respectively. Both prevalences were higher in women [80.8% (n = 21) presented underweight and 77.7% (n = 101) were overweight].

Regarding the FRAIL questionnaire, 35.4% (n = 86) of participants reported feeling fatigue, 29.6% (n = 72) were unable to climb a flight of stairs and 17.7% (n = 43) were unable to walk a block. 24.3% (n = 59) of the participants had more than 5 diseases diagnosed and 15.2% (n = 37) showed a percentage of weight loss higher than 5% in the last 6

months. In the final score, more than 50% of participants presented a risk of pre-frailty and frailty [39.5% (n = 96); 18.5% (n = 45), respectively].

Category	Question	Points	Total
Fatigue	Are you fatigue?	0	64,6%
		1	35,4%
Resistance	Cannot walk up 1 flight of stairs.	0	70,4%
		1	29,6%
Locomotion	Cannot walk 1 block.	0	82,3%
		1	17,7%
Illnesses	Do you have more than 5 diseases?	0	75,7%
		1	24,3%
Weight loss	Had you lost more than 5% of your weight in the past 6 months?	0	84,8%
		1	15,2%
FINAL SCORE			
	Male	Female	Total
Pre-Frail (1–2 points)	740% (n = 71)	26,0% (n = 25)	39,5%
Frail ( $\geq 3$ points)	82,2% (n = 37)	17,8% (n = 8)	18,5%

**Conclusions:** It was verified that more than half of the sample presented a risk of pre-frailty and frailty, mainly affecting women.

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**Disclosure of Interest:** None declared.

#### MON-PO342

#### RELATION BETWEEN RAMADAN FASTING AND SARCOPENIA

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**Rationale:** Ramadan fasting is a unique model that is associated with the restriction of food and fluid intake. The purpose of this study was to evaluate the physiological effects of Ramadan fasting on loss of muscle mass in the elderly.

**Methods:** Healthy elderly aged 60 years and older were included in the study. Measurements were taken both before and after Ramadan fasting. Body mass index (BMI) was calculated by dividing weight (in kilograms) by height. Walking speed was expressed in meters per second (m/s). Muscle strength was assessed by hand grip strength (HGS) with a dynamometer. A Bioelectrical impedance analysis (BIA) device (BodystatQuadScan 1500, UK) was used for the evaluation of body composition and muscle mass. Dietary data of the patients during Ramadan were obtained by a 43-item Food Frequency Questionnaire (FFQ).

**Results:** Thirty subjects fasted  $\geq 30$  days. The mean age (Standard Deviation (SD)) of the elderly was 66.7(4.7) years of age and 50% were females. There were no significant changes in body weight, sarcopenia, or body composition in either the females or males between, before, or after Ramadan fasting. The mean SMI, mean (SD) kg/m<sup>2</sup>, values of females and males with adequate milk and yogurt consumption before and after Ramadan fasting were 8.03 (0.75) kg/m<sup>2</sup> and 8.43(1.03) kg/m<sup>2</sup> for females (p = 0.133) and 10.11 (0.79) kg/m<sup>2</sup> and 10.35 (0.93) kg/m<sup>2</sup> for males (p = 0.059), respectively. The mean SMI, mean (SD) kg/m<sup>2</sup>, values of females and males with inadequate milk and yogurt consumption before and after Ramadan fasting were 8.01(0.93) kg/m<sup>2</sup>



and 7.79 (0.82) kg/m<sup>2</sup> for females (p = 0.242) and 9.82 (1.16) kg/m<sup>2</sup> and 9.29(0.76)kg/m<sup>2</sup> for males (p = 0.105), respectively.

**Conclusions:** Ramadan fasting supplied no risk for loss of muscle mass and muscle strength in the elderly sample population. Elderly who consumed enough milk and yoghurt in Ramadan, had no loss of muscle mass.

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#### MON-PO343

##### SARCOPENIA AND ITS ASSOCIATION WITH DYSPHAGIA: INSIGHTS FROM THE VICIOUS CYCLE

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**Rationale:** Nutritional deficits are known to cause sarcopenia (1). There is also evidence that sarcopenia itself may cause dysphagia, and swallowing problems are among the reasons for patients to have nutritional deficits (2). This study aims to evaluate the prevalence of nutritional deficits and dysphagia in patients with or without sarcopenia.

Med (min-max) or n (%).

	No sarcopenia (n:64)	Probable sarcopenia (n:42)	Sarkopenia (n:22)	p
Dysphagia	10(%15,6)	10(%24,4)	9(%39,1)	0,026**
EAT-10	0(0–6)	0(0–13)	1(0–35)	0,0001*.,***
SARCF	2(0–9)	8(4–10)	8(4–10)	0,0001*.,**
Walking velocity (m/sn)	5,4(0–12,1)	0(0–25,7)	0(0–8,1)	0,0001,**
Grip strength (right)	18,9(0–46,3)	9,2(0–45,7)	0(0–25,4)	0,0001*.,**
Grip strength (left)	15,5(0–41,1)	7(0–26,9)	5,6(0–24)	0,0001*.,**
Beck depression score	9,5(0–29)	14(0–31)	14(0–40)	0,104
MDA global score	4(2–5)	4(2–5)	4(2–5)	0,778
MDA physical score	36(5–40)	34(22–40)	32(17–40)	0,918
MDA functional score	21(16–40)	21(18–25)	20(10–25)	0,532
MDA emotional score	29(16–33)	26(19–32)	25(14–40)	0,026
MDA toplam skor	91(62–100)	85(65–100)	85(48–100)	0,399
Malnutrition screening point	13(3–14)	10(3–14)	9(0–13)	0,0001*.,***
Malnutrition index	26(8,5–29)	22,5(10–28,5)	19,5(10–26,5)	0,0001*.,***

\*Difference present between no sarcopenia and probable sarcopenia.

\*\*Difference present between no sarcopenia and sarcopenia.

\*\*\*Difference present between probable sarcopenia and sarcopenia.

**Methods:** 128 patients residing in a rehabilitational clinic are evaluated with EAT10, MD Anderson Dysphagia Inventory, Functional Oral Intake Status scale, Mini Nutritional Assessment and Beck Depression Index. All patients were then classified according to

SARC-F scores as well as latest sarcopenia classification proposed by EWGSOP in 2018 (3). Muscle strength and mass were assessed using a hand dynamometer and measuring calf circumference, respectively. Walking velocity was assessed using 4 meters walk test. Patients belonging to sarcopenia, presarcopenia and non sarcopenia groups were then compared using relevant statistical methods to show whether there are differences in outcomes mentioned as well as demographical and clinical status.

**Results:** Demographical and clinical properties of the patients from 3 groups.

Presence of orophageal dysphagia risk was only found between sarcopenic and non sarcopenic individuals (p = 0,026) other comparisons being insignificant. EAT-10 scores seemed to be significantly worse for presarcopenic and sarcopenic individuals, and their in between comparison also showed sarcopenics were worse than presarcopenics (p = 0,001). While gait velocity only differed between individuals with sarcopenia and not sarcopenic ones, grip strength were deteriorated for both sarcopenic and presarcopenic individuals when compared to non-sarcopenics. MNA scores were still significantly worse for presarcopenics and sarcopenics, latter being even worse than the other two (p = 0,0001).

**Conclusions:** Dysphagia and nutritional impairments may be seen in the course of sarcopenia, and this also applies for the condition of presarcopenia. Further evidence from prospective studies utilizing more objective ways for assessing dysphagia or sarcopenia in different sarcopenic patients with distinct comorbidities are required.

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#### MON-PO344

##### DIFFERENTIAL EVOLUTION OF RESTING ENERGY EXPENDITURE IN SARCOPENIC ALDERY SUBJECTS

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**Rationale:** Sarcopenia is a muscle disorder that is associated with adverse outcome and mortality. The European Working Group on Sarcopenia in Older People (EWGSOP) updated recently the algorithm for sarcopenia diagnosis, defining new cut-off points for sarcopenia tests. Based on the main cut-off points of the appendicular skeletal muscle (ASM) and ASM adjusted for height squared (ASM/h<sup>2</sup>), we assessed the evolution over three years of resting energy expenditure (REE) adjusted for lean body mass (LBM) in alderly subjects.

**Methods:** Community subjects underwent measurements at baseline (T0) of REE by indirect calorimetry and LBM by dual-energy x-ray absorptiometry. Measurements were repeated 3 years later (T3) in most subjects. Data were expressed as means±SD and statistical comparisons were performed using t-tests.

**Table 1** (abstract: MON-PO344).

	Women				Men			
	Sarcopenic		Non sarcopenic		Sarcopenic		Non sarcopenic	
	T0 n = 20	T3 n = 18	T0 n = 37	T3 n = 34	T0 n = 18	T3 n = 18	T0 n = 48	T3 n = 36
REE(Kcal)	1136.4 ± 61	1012.1 ± 90	1323.6 ± 164.7 <sup>†</sup>	1249.2 ± 118 <sup>†</sup>	1282.6 ± 92	1261 ± 135.4	1524.5 ± 141 <sup>†</sup>	1489.2 ± 1 <sup>†</sup>
REE/LBM (Kcal/kg)	30.2 ± 1.0	27.7 ± 1.6*	29.3 ± 2.2	28.2 ± 1.9	26.0 ± 1.5	25.6 ± 2.1	25.9 ± 2.1	25.3 ± 2.1

\*p &lt; 0.05 T3 vs T0.

<sup>†</sup>p < 0.05 Non sarcopenia vs sarcopenia.

**Results:** During the follow-up, REE were significantly higher in non sarcopenic than sarcopenic subjects in both genders (Table 1). The REE values in women tended to decrease during the follow-up. When the REE values were normalized to LBM, the REE/LBM values significantly decreased in sarcopenic women during the follow-up. By contrast the REE/LBM values did not change in both non sarcopenic and sarcopenic men subjects during the follow-up.

**Conclusions:** The decrease of REE with aging in sarcopenic women is not related only to the decrease of the lean component. By contrast, the REE seems to be directly related to lean component in aging men.

**Disclosure of Interest:** None declared.

#### MON-PO345

##### 2 + 2 (+2) = 4: A NEW APPROACH FOR APPENDICULAR MUSCLE MASS ASSESSMENT BY ULTRASOUND

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**Rationale:** Ultrasound (US) might be a useful appendicular skeletal muscle mass (ASM) assessment tool in the sarcopenia context, but neither normative data or prediction equations are currently available for Latin Americans. We aimed to develop new ASM prediction models from an elderly South American sample.

**Methods:** Cross-sectional evaluation of 190 community-dwelling subjects ≥60 y from *COMO VAI?*, a population-based Brazilian study. ASM was measured by dual-energy X-ray absorptiometry (DEXA). US muscle thickness (MT) was assessed on the anterior aspect of both upper and lower limbs from supine subjects, and, along with anthropometric data, used to develop ASM prediction models through backward stepwise regression analysis. The best performing models were assessed for biases using Bland-Altman analysis, and their simulated validity was assessed by bootstrap.

**Results:** The selected models were:

**Equation 1:**  $ASM = (3.27 * sex) + 16 * h + (0.2 * AL) + (0.09 * DACirc) + (0.04 * DTcirc) + (1.25 * DAMT) + (0.72 * DTMT) - 24.9$

**Equation 2 (without circumferences, in the presence of edema):**  $ASM = (2.39 * sex) + (15.14 * h) + (0.29 * AL) + (1.93 * DAMT) + (0.87 * DTMT) - 23.78$

[ASM (kg); sex: female 0, male 1; h: height (m); AL: arm length (cm); DACirc: dominant arm circumference (cm); DTcirc: dominant thigh circumference (cm); DAMT: dominant arm MT (cm); DTMT: dominant thigh MT (cm)]

Adjusted R<sup>2</sup>, root mean square error and limits of agreement for each model were, respectively: 0.90, 1.23 kg, (-2.36, 2.36 kg); 0.89, 1.30 kg,

(-2.51, 2.51 kg). ASM estimates were unbiased and not significantly different from DEXA measurements. Both models' validity was favorably suggested by bootstrap.

**Conclusions:** From only two US MT assessments and a few anthropometric measurements – hence, *two US sites + two lengths (+ two circumferences, in the absence of edema) = four limbs' muscle mass* – the proposed models represent a practical new approach for muscle assessment in the elderly.

**Disclosure of Interest:** None declared.

#### MON-PO346

##### FUNCTIONAL TEETH IMPROVE NUTRITIONAL STATUS AND SELF-CARE ACTIVITY IN ELDERLY PEOPLE

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**Rationale:** Good oral function is essential to live in a healthy life especially for elderly people. The Japanese Ministry of Health, Labor and Welfare advocates to keep more than twenty teeth even after eighty years old (called 8020 Campaign). The significance of residual teeth and denture in nutritional status and self-care activity was investigated.

**Methods:** Eighty-nine elderly people (23 males, 66 females, mean age, 84 ± 4 years) who are long-term admitted to a geriatric health care services facility in a stable state were subjected. The association of remaining teeth with nutritional status evaluated by serum albumin and self-care activity evaluated by Barthel Index (BI) was investigated. Then the significance of functional teeth supported by denture was examined.

**Results:** The correlation coefficients of residual teeth with serum albumin and BI were  $r = 0.053$  ( $p = 0.607$ ) and  $r = -0.048$  ( $p = 0.657$ ), respectively. Those of functional teeth, were  $r = 0.189$  ( $p = 0.080$ ) and  $r = 0.327$  ( $p = 0.00175$ ), respectively. The number of residual teeth was not associated with serum albumin or BI at all, meanwhile that of functional teeth was associated with BI. The correlation coefficients of BI with serum albumin was  $r = 0.399$  ( $p = 0.00011$ ), then the functional teeth might be somehow associated with serum albumin. The subjects were classified into two groups, Group A and Group B according to the number of residual teeth of 0 to 19 and 20–28. They were also divided into groups C and D according to the number of functional teeth of 0–19 and 20–28. Serum albumin was 3.45 ± 0.53 g/dl in Group A and 3.55 ± 0.55 g/dl in Group B ( $p = 0.24$ ). BI was 49.3 ± 29.5 in Group A and 45.0 ± 31.1 in Group B ( $p = 0.29$ ). Serum albumin was 3.35 ± 0.43 g/dl in Group C and 3.53 ± 0.57 g/dl in Group D ( $p = 0.082$ ). BI was 36.6 ± 31.9 and 54.1 ± 27.2, respectively ( $p = 0.0042$ ). In the comparison of Group C and Group E of number of functional teeth 28, the serum albumin was 3.59 ± 0.56 g/dl ( $p = 0.0398$ ) and BI was 58.8 ± 24.9 ( $p = 0.0011$ ) in

Group E. There were 34 people with full denture and three people with residual teeth in Group E.

**Conclusions:** The residual teeth were not associated with serum albumin or BI at all. However, the full denture was significantly associated with serum albumin and BI. The full denture seems to work well for better nutritional status and self-care activity. It is very important to get foods orally by using full denture, if necessary, for elderly people.

**Disclosure of Interest:** None declared.

#### MON-PO347

##### A NUTRITIONAL TELECARE SYSTEM: THE CULTURAL IMPACT ON STAFF

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**Rationale:** A new and specialist telecare system, eViSuS, has been in use in the Clinical Nutrition Service of S. Lazzaro Hospital (Alba, Italy) since August 2016, for the management of malnourished patients in Nursing Home (NH), through remote video-visits. From August 2016 to December 2018 386 video-visits were performed on 97 patients. The target of the study is to assess healthcare staff satisfaction.

**Methods:** A validated survey was submitted anonymously to the hospital and NH healthcare professionals who use eViSuS. Questions covered different subjects, including ease of use, audio-video quality, perceived quality of the relationship with the patient and overall satisfaction.

**Results:** 26 surveys were completed. eViSuS was easy to use (92% score) and made it possible to carry out a greater number of specialist visits on NH patients (88% score). Despite the system being equipped with high-performance cameras and microphones, the perceived audio-video quality of the system was not always optimal due to its reliance on the speed of the internet connection. Telecare fit well in the staff work plans (77% score), allowing them to carry out more activities during the working day. eViSuS improved the relationship with the patient (80% score) and increased the ability to communicate (100% score). Staff confirmed to be able to respond to patient's needs through telecare (73% score). 93% of healthcare professionals were overall satisfied with eViSuS, however only 19% preferred a video-visit to a face-to-face visit.

**Conclusions:** The staff was satisfied and considered eViSuS a user-friendly and valid tool, however the traditional face-to-face visit was preferred over the video-visit. The cultural impact is still one of the main barriers to the spread of telemedicine: despite its huge potential in terms of efficiency and greater access to care, acceptance of this assistance procedure is essential to enable its diffusion and implementation.

**Disclosure of Interest:** None declared.

#### MON-PO348

##### PREVALENCE AND RISK FACTORS OF AGE-RELATED SARCOPENIA IN THAI COMMUNITY-DWELLING ELDERLY

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**Rationale:** Sarcopenia is one of the most important causes of dependence and mortality in elderly. Few studies have investigated

prevalence and risk factors of age-related sarcopenia in Asian community-dwelling elders.

**Methods:** This cross-sectional study was performed in 330 people aged over 60 years in community-based setting from October 2017 to July 2018. Participants were evaluated for muscle strength by handheld dynamometer, muscle performance by 6-meter gait speed, and muscle mass by bioelectrical impedance analysis (BIA). Sarcopenia was diagnosed by Asian Working Group for Sarcopenia (AWGS) criteria. The prevalence of sarcopenia was calculated. Risk factors associated with sarcopenia were analyzed using univariable and multivariable logistic regression analysis.

**Results:** The prevalence of sarcopenia and sarcopenic obesity was 10% and 3.3%, respectively. In multivariable logistic regression analysis, age was an independent risk factor of sarcopenia, with an odds ratio of 6.87 (95% confidence interval (CI): 1.63 – 28.88;  $p < 0.001$ ) in middle old group (age 70–79 years), and 13.71 (95% CI: 3.66–51.41;  $p = 0.009$ ) in very old group (age  $\geq 80$  years). Pre frailty was a significant risk factor of sarcopenia (odds ratio 4.75, 95% CI: 1.90–11.89;  $p < 0.001$ ). Low physical activity significantly increased risk of sarcopenia, with an odds ratio of 15.35 (95% CI: 1.69–139.47;  $p = 0.015$ ) in the moderate physical activity group (1401–2800 kcal/week) and an odds ratio of 17.99 (95% CI: 1.95–165.73;  $p = 0.011$ ) in the lowest physical activity group ( $\leq 1400$  kcal/week). Other factors, including gender, body mass index, nutrition status, and protein intake, were not significantly associated with sarcopenia.

**Conclusions:** Age-related sarcopenia was found in one-tenth of Thai community-based elderly. Age, prefrailty, and low physical activity were independent risk factors associated with sarcopenia.

**Disclosure of Interest:** None declared.

## Liver and gastrointestinal tract II

#### MON-PO349

##### AGREEMENT BETWEEN BIOELECTRICAL IMPEDANCE AND DUAL-ENERGY X-RAY ABSORPTIOMETRY FOR ASSESSING SKELETAL MUSCLE MASS LOSS IN PATIENTS WITH CHRONIC HEPATITIS C

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**Rationale:** Skeletal muscle mass loss (SMML) has been reported to frequently occur in chronic liver diseases and can be identified in 30.0%–70.0% of cirrhotic patients.<sup>1</sup> Given the potential relevance of SMML in hepatic diseases, a practical screening tool for earlier detection of SMML is of utmost significance. We assessed the degree of agreement between the two methods bioelectrical impedance analysis (BIA) and energy X-ray absorptiometry (DXA) for SMML estimation.

**Methods:** Prospectively, we analysed DXA and BIA measures in 104 CHC patients followed in a viral hepatitis outpatients clinic. Body composition was assessed under standardized conditions by DXA (Hologic, Inc., Bedford, MA) and BIA (RJL Systems Quantum, Clinton Township, MI). The cut-off points for SMML, for women and men assessed by BIA were  $<15.0$  kg/m<sup>2</sup> and  $<17.4$  kg/m<sup>2</sup> and by DXA were  $<5.45$  and  $<7.26$  kg/m<sup>2</sup>, respectively.<sup>2</sup> Agreement between the devices was calculated by using the Kappa statistic.

**Results:** The baseline characteristics of the CHC patients were: mean age,  $50.5 \pm 11.2$  years; 25.0% females; 67.3% noncirrhotic and 32.7% compensated cirrhotic patients; 43.3% hypertensive patients; 21.2% diabetic patients. SMML, assessed by BIA and DXA, was observed in



16.5% and 14.4% patients, respectively. For CHC patients, the Kappa result [(All CHC patients,  $n = 104$ ), Kappa = 0.87;  $P \leq 0.001$ ; (female CHC patients,  $n = 26$ ), Kappa = 0.92;  $P \leq 0.001$ ; (male CHC patients,  $n = 78$ ), Kappa = 0.85;  $P \leq 0.001$ ].

**Conclusions:** BIA appears to have potential for assessing SMML in CHC patients, as obtained using DXA. Overall, these findings reinforce the potential of BIA to be widely applied by healthcare professionals in caring for patients with CHC in clinical routine practice.

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**Disclosure of Interest:** None declared.

#### MON-PO350

##### IS THERE ANY CORRELATION BETWEEN CRITICAL AGGREGATION NUMBER AND LIVER PARAMETERS IN PATIENTS ON LONG-TERM PARENTERAL NUTRITION?

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**Rationale:** Critical Aggregation Number (CAN) is a parameter describing the stability of lipid emulsions (LE) in parenteral nutrition (PN) admixtures. It reflects the concentration of all cations in PN – the higher the concentration of the cations the higher their destabilisation force on the lipids which in turn is detrimental for the liver. A value of 600 is considered a cut-off: below that PN admixtures are safe. However, this value is controversial and often a clinical situation requires a higher content of cations, leading to a higher CAN. The aim of the study was to compare liver parameters and relate the influence of CAN below and above 600 on liver parameters of patients receiving PN.

**Methods:** Fifty three PN regimes were enrolled into the observation: 23 PN regimes with CAN >600 and 30 with CAN ≤ 600. The patients received PN for average 23 months (range 3–60). Patients were aged 26–91 years and they did not have any concomitant liver problems. Alanine aminotransferase (AlaAT), aspartate aminotransferase (AspAT) and gamma glutamyl transpeptidase (GGTP) were measured during the whole observation period and the averages were compared to CAN. The values of liver enzymes between the two groups (CAN below and above 600) were analysed using nonparametric Mann-Whitney U test.

**Results:** None of the liver enzymes differed between the two CAN groups.

CAN	AlaAT (U/L)	AspAT (U/L)	GGTP (U/L)
>600	67 (14–224)	44 (15–199)	112 (17–812)
≤600	73 (15–389)	44 (14–242)	112 (16–343)
p	0.779	0.865	0.293

**Conclusions:** Based on these observations, CAN should not be used as a limiting factor while designing PN formulas. However, these results must be considered preliminary; there is a need to a study with more

patients and using physical examination of the lipid particles in the PN formulation.

**Disclosure of Interest:** None declared.

#### MON-PO351

##### PATIENT CHARACTERISTICS AND CLINICAL OUTCOMES IN A SPECIALISED INTESTINAL FAILURE UNIT: AN OBSERVATIONAL COHORT STUDY

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**Rationale:** Intestinal failure (IF) is defined by a need for intravenous (IV) supplementation. Patients may present with multiple morbidities, and IV treatments carry a risk for catheter-related complications. Few studies described patient characteristics and clinical outcomes according to type of IF.

**Methods:** We consecutively included patients who were admitted to a newly established inpatient IF unit (IFU) from 2013 through 2017. We evaluated patient characteristics and clinical outcomes of all patients' first admission. Outcomes included IF classification, length of stay, central line-associated blood stream infection (CLABSI), and discharge on home parenteral support (HPS). Follow-up was conducted six months after discharge for mortality and the continued need for HPS.

**Results:** A total of 236 patients were evaluated, including 39 (17%) with type 1 IF, 123 (52%) with type 2 IF, and 74 (31%) with type 3 IF. Of 91 who had a central venous catheter (CVC) on admission, CLABSI was present in 11 (12%). The CLABSI occurrence during admission was 2 (1%) of 173 patients with a CVC. Mean length of stay declined from mean 33 days (95% confidence interval (CI): 26.2–42.5) in 2013 to 15 days (95% CI: 12.2–17.7) in 2017 ( $p < 0.0001$ ). Undiagnosed comorbidity was revealed in 165 patients (70%) with unchanged frequency during the study period ( $p = 0.8$ ). Sixty-seven (28%) patients were discharged with HPS.

**Conclusions:** Inpatients with IF present with multiple morbidities. CLABSI should be investigated on admission. A low inpatient CLABSI rate may be achieved through the implementation of a specialised IFU.

**Disclosure of Interest:** None declared.

#### MON-PO352

##### CLINICAL EFFICACY OF A DURUM WHEAT VARIETY-BASED (SENATORE CAPPELLI) PASTA IN PATIENTS WITH NON-CELIAC GLUTEN SENSITIVITY: A DOUBLE-BLIND RANDOMIZED CROSS-OVER TRIAL

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**Rationale:** To compare the effects of an organic durum wheat variety ('Senatore Cappelli,' SC) pasta with standard commercial wheat pasta in patients with diagnosed non-celiac gluten sensitivity (NCGS).

**Methods:** A double-blind, randomized trial was performed Between April 2018 and July 2018, at the Fondazione Policlinico Gemelli IRCCS in Rome, on patients with NCGS. Patients were randomly assigned to a two-week diet with SC wheat variety pasta or a two-week diet with standard commercial pasta. After a two-week washout period (gluten-free diet), each patient crossed over to the other treatment group. Symptoms were assessed through a modified version of the Gastrointestinal Symptom Rating Scale (GSRS), tailored on NCGS. Wilcoxon signed-rank test was used to compare nonparametric data. The Bonferroni correction for multiple comparisons was applied. Two-tailed p values <0.05 were considered significant.

**Results:** Forty-two patients were enrolled. Patients reported lower overall GSRS when in SC pasta group than standard pasta (p=0.03). Significantly lower scores were reported in several specific gastrointestinal (bloating, abdominal distention, eructation, flatus, and feeling of incomplete evacuation) (p<0.05) and extra-intestinal symptoms (dermatitis and limb numbness) (p<0.05) in SC group.

**Conclusions:** Patients with NCGS experienced lower gastrointestinal and extra-intestinal symptom scores eating SC wheat variety pasta compared to standard commercial wheat pasta. If confirmed in larger studies, this evidence could pave the way to new alternative approaches to NCGS.

**Disclosure of Interest:** None declared.

#### MON-PO353

##### EQUAL EFFICACY OF GASTRIC AND JEJUNAL TUBE FEEDING IN LIVER CIRRHOSIS AND/OR ALCOHOLIC HEPATITIS – A RANDOMISED CONTROLLED TRIAL

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**Rationale:** Malnutrition is a frequent complication in decompensated liver cirrhosis and alcoholic hepatitis.

Hospitalized patients who don't meet nutritional requirements are recommended to be enteral or parenteral fed. No guidelines recommend a specific type of tube. We hypothesized that jejunal tube feeding increases delivery of food in the intestine.

**Methods:** 40 inpatients with liver cirrhosis or alcoholic hepatitis and a daily energy intake <75% of the calculated requirements were included consecutively and randomised 1:1 to: 1) Nasogastric (NG) feeding or 2) Nasojejunal (NJ) feeding. All received Peptamen AF<sup>®</sup> as enteral supplement to their oral intake. Participants were fed for 7 days, or followed until discharge or death. The total amount of calories and proteins delivered (tube feeding or eaten by the patient) was calculated. Patients with hepatic encephalopathy grade 3 or 4 were excluded. Descriptive statistics were used in the calculation.

**Results:** Of 146 patients screened, 40 were randomized (40% males, mean age 58 years, 70% cirrhosis, 10% alcoholic hepatitis, 20% both. 30% were Child-Pugh (CP)-B, 70% CP-C. A total of 33 patients fulfilled 7 days. Mean daily energy intake for 7 days were 6400 kJ (NG) vs. 5900 kJ (NJ) (p=0.53). CP-B & NG: 6100 kJ; CP-B & NJ: 5415 kJ; CP-C & NG:

5935 kJ; CP-C & NJ: 5520 kJ. Calculated caloric requirement was not acquired in either group. Tubes were accidentally removed by the patients: once 36; twice 22; three times 10, no differences between NG and NJ.

**Conclusions:** NJ feeding was not superior to NG feeding in alcoholic hepatitis with or without cirrhosis. NG tube was more efficacious in both Child-Pugh B and C patients. Nutritional needs remained unmet in both groups. The number of accidental tube displacements was not related to the type of tube. Based on this study, the use of the more difficult to install jejunal tube is not justified.

**Disclosure of Interest:** None declared.

#### MON-PO354

##### IMPACT OF POSTOPERATIVE ADMINISTRATION OF HMB-RICH NUTRIENTS WITH REHABILITATION ON SARCOPENIA AND OUTCOMES AFTER LIVER TRANSPLANTATION: A PILOT RANDOMIZED CONTROLLED TRIAL

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**Rationale:** Most patients undergoing liver transplantation (LT) are associated with low skeletal muscle mass, malnutrition, and low activity. These comorbidities prevent early recovery after surgery due to various causes including low activity and infection. Therefore, we performed a pilot randomized controlled trial examining the impact of -hydroxy- -methylbutyrate (HMB), leucine metabolite with promoting synthesis and suppressing proteolysis, with post-operative rehabilitation on sarcopenia and outcomes after adult living donor LT (LDLT).

**Methods:** Between March 2017 and October 2018, patients who underwent adult LDLT were randomly assigned to HMB group and control group using pre-stratification allocation method according to factors including sex, age, and preoperative muscle mass. Patients in the HMB group were administered HMB-rich nutrients orally or enterally from postoperative day (POD) 1–30 with postoperative rehabilitation. Excluding some cases who could not undergo post-operative rehabilitation enough, 12 patients in HMB group and 11 in control group were assessed for the following (on treatment analysis); 1) background, 2) incidence of postoperative bacteremia, blood biochemical data, and postoperative hospital stay, 3) ratio for preoperative value of skeletal muscle mass index and grip strength at 1 and 2 months after LDLT.

**Results:** Regarding patients and surgical characteristics, there were no significant differences between 2 groups. In the HMB group, incidence of postoperative bacteremia was significantly lower (P=0.043), WBC level at POD 21 was significantly lower (P=0.005), and postoperative hospital stay was significantly shorter (P=0.028) compared with the control group. Ratio for preoperative value of skeletal muscle mass index showed higher tendency in the HMB group. Grip strength was significantly higher in the HMB group than the control group (1 month, P=0.003; 2 month, P=0.005).

**Conclusions:** Administration of HMB-rich nutrients with rehabilitation after LDLT significantly increased grip strength, decreased posttransplant bacteremia and shortened postoperative hospital stay.

**Disclosure of Interest:** None declared.

**MON-PO355**  
**INTESTINAL PERMEABILITY MARKER ZONULIN IN SERUM DECREASES WITH FATTY LIVER DISEASE DURING WEIGHT LOSS IN OBESITY, WITH NO CORRELATION TO BODY COMPOSITION.**

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**Rationale:** Studies point to an altered intestinal permeability (IP) in obesity and its role in non-alcoholic fatty liver disease (NAFLD). A Western style diet might lead to increased IP with microbial translocation, which in turn causes inflammation and thus may contribute to NAFLD. Metabolic endotoxemia can initiate insulin resistance (IR), a risk factor for NAFLD, but is also associated with sarcopenic obesity (SO).

**Methods:** We retrospectively investigated whether weight loss (WL) leads to an improvement in IP. We also analyzed connections between altered IP, NAFLD and body composition (BodC). NAFLD was estimated by ultrasound and BodC by body impedance analysis. Zonulin in serum (SZ), a modulator of tight junctions and marker of paracellular permeability was measured by enzyme-linked immunosorbent assay, the urinary lactulose/mannitol ratio (r-l/m) was used to determine transcellular as well as paracellular permeability. Data of 25 subjects undergoing a structured 52-week multidisciplinary weight loss intervention were analyzed by Wilcoxon test. Differences between subgroups were analyzed by Mann-Whitney U test; correlations by Spearman's rho.

**Results:** A mean WL of 21.2 kg between baseline and week 52 leads to a reduction in SZ ( $19.8 \pm 5.7$ – $16.3 \pm 5.0$  ng/ml,  $p = 0.015$ ), r-l/m ( $0.050 \pm 0.010$ – $0.017 \pm 0.005$ ,  $p = 0.001$ ) and NAFLD prevalence (80% to 40%,  $p = 0.006$ ). Compared to obese subjects without NAFLD, those with NAFLD showed a higher r-l/m ( $0.022 \pm 0.013$  vs.  $0.033 \pm 0.010$ ,  $p = 0.005$ ) and SZ ( $16.2 \pm 4.7$  vs.  $18.70 \pm 4.7$  ng/ml,  $p = 0.032$ ). SZ and r-l/m also increased with severity of steatosis, and were higher in patients with moderate to severe steatosis than in those with mild steatosis (SZ:  $p < 0.05$  and r-l/m:  $p < 0.001$ ) or without steatosis (SZ:  $p < 0.01$  and r-l/m:  $p < 0.001$ ). Obese subjects with IR showed higher SZ levels than those without IR ( $18.8 \pm 4.6$  vs.  $14.4 \pm 5.0$ ,  $p = 0.001$ ). R-l/m was higher when metabolic syndrome (MetS) was present compared to no MetS ( $0.035 \pm 0.018$  vs.  $0.024 \pm 0.012$ ,  $p = 0.009$ ). There was neither a correlation between SZ and BodC measures nor between SZ and r-l/m.

**Conclusions:** These results indicate that IP, both via tight junctions and the transcellular path, improves with WL accompanied by an improvement in NAFLD. The data suggest associations between impaired IP and NAFLD, IR as well as MetS. No association was found between SO and IP nor between NAFLD and BodC, yet it should be subject of further research.

**Disclosure of Interest:** None declared.

**MON-PO356**  
**A HUMAN GUT BACTERIUM TRIGGERS OBESITY AND NON-ALCOHOLIC FATTY LIVER DISEASE IN GERM-FREE MICE THROUGH LPS-DEPENDENT MECHANISM**

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**Rationale:** Several lines of evidence suggest a link between the gut microbiota and the etiology of obesity and NAFLD. Among the

potential mediators of this association, lipopolysaccharides from the gut may play a key role in this pathogenesis. However, the causative responsibility of endotoxin producers in human NAFLD remains to be identified.

**Methods:** Germ-free mice were colonized by *Enterobacter* spp. B29, a bacterial strain isolated from a morbidly obese volunteer's gut. Mice were administered a control or a high-fat diet. Development of obesity, metabolic disorders and NAFLD was assessed and compared with germ-free mice (not colonized) administered the same diets.

**Results:** We first demonstrated that *Enterobacter* spp. B29 induced obesity and NAFLD in germ-free (GF) mice. While GF mice did not develop obesity or steatosis whatever the diet, massive adiposity and hepatic steatosis were observed in mice mono-associated with B29 on high-fat diet but not on normal chow diet. Moreover, mice associated with B29 developed liver inflammation both on a high fat or a standard diet. This was associated with an increased expression of genes involved in lipogenesis and inflammation pathways in the liver of these mice.

Then, we constructed a B29-mutant by deletion of the *waaG* gene involved in LPS synthetic pathway. Markedly, the *E. cloacae* B29 *waaG* mutant lost the capacity to trigger obesity, insulin resistance, steatosis and liver inflammation in germ-free mice suggesting that endotoxin is the main molecular mechanism responsible for.

**Conclusions:** The approach described should be useful for defining the critical mechanisms of gut bacteria for the development of obesity and NAFLD and spawn new approaches of therapeutic interventions for modifying the structure of gut microbiota to control the development of metabolic diseases.

**Disclosure of Interest:** None declared.

**MON-PO357**  
**RESTING ENERGY EXPENDITURE MEASURED BY INDIRECT CALORIMETRY AND ESTIMATED BY PREDICTIVE EQUATIONS IN GALLBLADDER DISEASE PATIENTS**

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**Rationale:** Pathologic conditions that affect the gallbladder include cholelithiasis and associated complications such as acute and chronic cholecystitis, choledocholithiasis, gallstone pancreatitis, and cancer. In this prospective study, we investigated the impact of illness on resting energy expenditure (REE) and to compare REE measured by indirect calorimetry (IC) predicted by equation values.

**Methods:** Gallbladder disease patients (82) were evaluated from June 2015 to December 2016 during hospital stays at Surgery unit at Hospitalar Center São João, Portugal. Indirect calorimeter was used to measure REE (Cosmed k4 b2) and data was compared with energy expenditure estimated by Harris-Benedict, Mifflin-St.Jeor, Ireton-Jones and Schofield equations.

**Results:** Resting energy expenditure measured by indirect calorimetry didn't show correlation with estimated energy by formulas (Harris-Benedict, Schofield and Ireton-Jones). Accurate was poor and most all equations tested underestimated energy expenditure values. It suggests the need to develop specific formulas for this population.



**Table** (abstract: MON-PO357):

	REE	Estimated REE	Accurate prediction <sup>1</sup>	Underprediction <sup>2</sup>	Overprediction <sup>3</sup>
Equations	(kcal)	(kcal/kg)	(%)	(%)	(%)
REE-IC	1,734.7 ± 667.5	24.8 ± 9.7			
Harris-Benedict	1,413.6 ± 251.3 <sup>a</sup>	20.1 ± 2.2 <sup>a</sup>	26	54	21
Schofield	1,551.5 ± 277.9 <sup>a</sup>	21.6 ± 3.2 <sup>a</sup>	24	50	26
Ireton-Jones	1,541.1 ± 411.7 <sup>a</sup>	22.0 ± 5.1 <sup>a</sup>	20	46	34
Mifflin-St.Jeor	1,339.9 ± 251.9 <sup>a</sup>	19.1 ± 2.5 <sup>a</sup>	23	61	16

<sup>a</sup>Wilcoxon signed-rank test  $p < 0.05$ , compared with REE-IC (Resting energy expenditure measured by indirect calorimetry) distribution. <sup>1,2,3</sup>The percentage of subjects predicted by this predictive equation within 10%, under and over respectively of the measured value.

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**Disclosure of Interest:** None declared.

## MON-PO358

### Ω-3 FATTY ACID-BASED PARENTERAL NUTRITION SHORTENS HOSPITAL STAY IN ACUTE VARICEAL BLEEDING CIRRHOTIC PATIENTS

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**Rationale:** Acute variceal bleeding, a crucial complication of liver cirrhosis associated with high mortality, requires high energy expenditures but gastrointestinal bleeding limits enteral feeding in the acute stage. We investigated the safety and efficacy of ω-3 fatty acid-based parenteral nutrition in acute variceal bleeding patients with cirrhosis.

**Methods:** A total of 208 cirrhotic patients with acute variceal bleeding who underwent parenteral nutrition in the absence of enteral nutrition between January 2013 and December 2017 were enrolled. Among the patients, 86 patients had parenteral nutrition containing ω-3 fatty acid while 122 patients had parenteral nutrition devoid of ω-3 fatty acid. The primary endpoint was to evaluate the presence of clinical complications of liver cirrhosis and the duration of hospital stay.

**Results:** The mean age of the patients enrolled was 54.9 years-old and 185 patients (88.9%) were male. The cause of liver cirrhosis, grade of Child-Pugh score and comorbidities were statistically not different in patients with or without ω-3 fatty-acid in the parenteral nutrition. Compared to the patients without ω-3, patients with ω-3 containing parenteral nutrition had a significantly lower systolic blood pressure (101.6 ± 23.3 vs. 93.5 ± 23.1 mm Hg,  $p = 0.013$ ) and total bilirubin levels (3.8 ± 5.4 vs. 2.4 ± 2.9 mg/dL,  $p = 0.023$ ). The difference in the in-hospital mortality ( $p = 0.813$ ) or rate of complications ( $p = 0.880$ ) was not statistically significant between the two groups. The duration of hospital stay was significantly shorter in the patients who underwent ω-3 fatty acid-based parenteral nutrition (10.7 ± 7.3 vs. 7.9 ± 4.2 days,  $p = 0.001$ ).

**Conclusions:** In liver cirrhosis patients with acute variceal bleeding, ω-3 fatty acid-based parenteral nutrition significantly decreased the length of hospital stay.

**Disclosure of Interest:** None declared.

## MON-PO360

### INFLUENCE OF INPATIENT DIETARY RESTRICTION ON RECOVERY FROM AND REOCCURRENCE OF ACUTE, UNCOMPLICATED DIVERTICULITIS.

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**Rationale:** Recent literature suggests that a liberalised diet (i.e. no dietary restrictions) is safe for the inpatient management of acute, uncomplicated diverticulitis; however, physicians internationally continue to prescribe restricted diets (i.e., nil per os or fluid-only diets for >48 hours). This study aims to assess the impact of restricted versus liberalised inpatient dietary prescription on recovery and reoccurrence in adults with acute, uncomplicated diverticulitis.

**Methods:** Prospective observational study of adult patients admitted to two metropolitan hospitals in Queensland, Australia from 2016 to 2019. Hierarchical multiple linear regression was used to determine the impact of restricted versus liberalised diets on length of hospital stay (i.e., time to recovery). Stepwise binomial logistic regression was used to determine the impact of restricted versus liberalised diets on 30-day reoccurrence of diverticulitis.

**Results:** Of the 82 participants, 39 (64% female, mean age 57.6 ± 13.3 years, mean BMI 27.0 ± 4.3 kg/m<sup>2</sup>) were prescribed a restricted diet and 41 (49% female, mean age 58.1 ± 14.6 years, mean BMI 28.7 ± 4.8 kg/m<sup>2</sup>) were prescribed a liberalised diet. In the adjusted models, a liberalised diet decreased length of stay by 1.1 days (95%CI: -1.8 to -0.4;  $p = 0.004$ ). At 30-days post-discharge, there were no dietary, gastrointestinal symptom, demographic, or medical characteristics which predicted reoccurrence.

**Conclusions:** This study found that a liberalised diet for the management of acute, uncomplicated diverticulitis was associated with a shorter length of hospital stay compared to a restricted diet, and was not associated with diverticulitis reoccurrence. This study suggests a liberalised diet is safe, reduces burden on both the patient and the health care system, and may promote recovery from acute, uncomplicated diverticulitis.

**Disclosure of Interest:** None declared.

### MON-PO361 RESULTS OF A MULTICENTRIC RETROLECTIVE STUDY OF TEDUGLUTIDE TREATMENT IN BENIGN SHORT BOWEL SYNDROME IN GERMANY

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**Rationale:** Teduglutide (TED) is a medical treatment for intestinal functional rehabilitation of short bowel syndrome (SBS) patients with chronic intestinal failure (cIF). Its application and effectivity is routinely monitored in a structured home care service program by a multicentric approach in Germany. From these prospectively documented data, a retrolective data base was generated in order to study treatment characteristics and outcome parameters in a clinical routine setting of TED-treated cIF-patients.

**Methods:** For the present interim analysis, prospectively collected clinical data until December 2018 were retrolectively analyzed. Statistical analyses were performed with SPSS using repeated measures ANOVA and Friedman-Test with subsequent Bonferroni-adjusted post-hoc analyses for TED treatment characteristics up to one year.

**Results:** So far, 29 patients (f:17/m:12, median age 52 years) were included in this interim analysis. Causes of SBS included vascular (n = 12) and inflammatory diseases (n = 6), ileus (n = 4), injury (n = 4) and others (n = 3). Median time on parenteral support (PS) before TED was 30 months. At TED start, 72% of patients (21/29) received individually compounded parenteral nutrition (PN); the remaining 28% received standardized PN. PS was administered by patients themselves (n = 15), by relatives (n = 3), by nurses (n = 8) or others (n = 3). TED treatment resulted in a significant reduction in PN calories and volume requirements as well as reduced infusion days per week and shortened infusion times (see Table 1). The reduction of infusion time was positively correlated with the reduction of PN volume (p < 0.001; r = 0.75) and calories (p = 0.003; r = 0.59) after one year of TED treatment. After one year, 22 of 29 (76%) patients were considered responders to TED treatment (with a minimum of 20% i.v.-volume reduction).

**Table 1**  
Changes in parenteral support characteristics on teduglutide treatment.

	i.v. Volume per Week [L] (±SD)	i.v. Energy per Week [kcal] (±SD)	Infusion Time [h] (±SD)	PN days per week (±SD)
Baseline	13.2 (±7.9)	7.450 (±4.232)	11.0 (±3.0)	5.3 (±2.2)
Week 12 ± 1	11.3 (±7.7)*	6.301 (±4.241)	10.8 (±3.0)	4.5 (±2.2)**
Week 23 ± 2	10.3 (±7.3)**	5.176 (±4.123)*	9.8 (±4.2)	3.8 (±2.4)***
Week 49 ± 5	8.4 (±6.7)**	4.611 (±4.311)***	7.4 (±5.6)*	3.2 (±2.6)***

n = 24; p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001 vs. baseline; PN = parenteral nutrition.

**Conclusions:** In this multicentric real-world analysis of severely PS-dependent SBS/cIF-patients, TED displays effectivity with regards to improvement of intestinal absorptive function as indicated by significantly reduced weekly i.v.-volume and calorie requirements. In addition, the findings demonstrate a reduction of effective infusion days and times, which both importantly affect patients' wellbeing. These data indicate the effectivity of TED treatment in a national routine treatment setting in concordance with clinical trial data and guideline recommendations.

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### MON-PO362 VITAMIN D AND LIVER STEATOSIS IN PATIENTS WITH CHRONIC INTESTINAL FAILURE ON HOME PARENTERAL NUTRITION

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**Rationale:** The aim of the study was to determine the potential correlation between the serum vitamin D levels and the degree of liver steatosis in patients with chronic intestinal failure (CIF) on home parenteral nutrition (HPN). According to cross-sectional studies vitamin D deficiency seems to affect the development of non-alcoholic steatohepatitis (NASH), suggesting the potential effect of vitamin D in the development of non-alcoholic fatty liver disease (NAFLD) (1).

**Methods:** From January 2017 until December 2018 we were prospectively collecting data from medical records of patients with CIF (including serum vitamin D levels), who are on HPN therapy. Liver steatosis was diagnosed with magnetic resonance imaging. The association between vitamin D and liver steatosis was tested by univariate logistic regression. P value < 0.05 was considered statistically significant.

**Results:** We have collected data from 63 patients, 29 men (46%) and 34 women (54%), the median age was 65 years (min. 23 years, max. 81 years). The prevalence of liver steatosis was 28,6% (18 patients). Mean (SD) value of vitamin D was 41.3 (13.9) nmol/L, 41.9 (15.4) in patients with no liver steatosis and 39.8 (9.1) nmol/L in patients with liver steatosis. The P-value was 0,586; therefore no statistically significant association between vitamin D and liver steatosis was found.

**Conclusions:** We hypothesized that the presence of liver steatosis in intestinal failure associated liver disease (IFALD) is associated with low serum vitamin D levels through a similar pathophysiological mechanism as liver steatosis in NAFLD. In our group of CIF patients, no such correlation was found. However, mean vitamin D levels were relatively low in both groups of patients, mainly due to insufficient intestinal absorption. The limitation of our study is a relatively small sample size since liver steatosis is a relatively rare complication of an already small group of patients diagnosed with CIF and treated with HPN.

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**Disclosure of Interest:** None declared.

### MON-PO363 BIOIMPEDANCE-DERIVED PHASE ANGLE AND MORTALITY IN LIVER DISEASES

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**Rationale:** Bioimpedance-derived phase angle was reported to reflect cell membrane integrity, cell size and/or distribution of intra- vs. extracellular water. It has been shown to predict outcomes, such as mortality, functional status, quality of life and length of hospital in several chronic diseases. This study aims to investigate whether phase angle predicts mortality in mixed liver diseases.

**Methods:** We considered all patients with alcoholic and non-alcoholic liver disease, who participate in our cohort study. From our computer database, we retrieved the last body composition assessment (50-kHz bioelectrical impedance analysis (Nutrigoard<sup>®</sup>, Data Input), and mid arm muscle circumference (MAMC)), the MELD score (marker of liver insufficiency) and the mortality. Phase angle was standardized (PhAst) for sex, age, and body mass index (BMI), and categorized as < or ≥ -2.12, the median value. Univariate and multivariate Cox regressions evaluated whether PhAst predicted mortality.

**Results:** The analysis included 132 (26% women) participants among whom 42 died (29% women; 32 patients with a PhAst < median value). Median time between measurement and death was 85 days (range 1–707). A PhAst < the median value predicts mortality (HR :4.225, 95% CI 2.074–8.606, p < 0.001). This prediction remains significant when adjusting for MAMC (HR :3.2, 95% CI 1.457–7.011, p < 0.004), but not when adjusting for MAMC and the MELD score (HR :2.144, 95% CI 0.946–4.862, p = 0.068), suggesting that the MELD score captures the cell integrity measured with the PhAst.

**Conclusions:** This study demonstrated that 50 kHz phase angle is a valuable prognostic indicator of mortality in liver diseases, independently of age, sex, BMI and anthropometric measurements but not of MELD score.

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**Disclosure of Interest:** None declared.

### MON-PO364 PROTEOME CHARACTERISTICS OF LIVER TISSUE IN PATIENTS WITH LIVER DISEASE INDUCED BY LONG TERM TOTAL PARENTERAL NUTRITION

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**Rationale:** Parenteral nutrition (PN) associated liver disease (PNALD) is common and life-threatening complication for patients receiving PN. However, the definitive etiology of PNALD is not clear. We aimed to investigate the potential molecular mechanism of PNALD.

**Methods:** Liver tissue was derived and compared between selected patients with (n = 3) /without (n = 4) PNALD via isobaric Tag for Relative and Absolute Quantitation (iTRAQ)-based quantitative proteomics. The key different proteins between two groups were explored and verified by Western-blot. Bioinformatics analysis was performed using Gene Ontology (GO) and Kyoto Encyclopedia of Genes and Genomes (KEGG) databases to explore the mechanisms of PNALD.

**Results:** A total of 112 proteins were found to be differentially expressed. 73 proteins were down-regulated, and 39 proteins were up-regulated in PNALD group. Bioinformatics analysis showed that the differentially expressed proteins (DEPs) were associated with mitochondrion, and involved in mitochondrial electron transport, mitochondrial respiratory chain complex I assembly, oxidation reduction process, response to oxidative stress and oxidative phosphorylation.

**Conclusions:** The results indicated that the energy metabolism dysfunction initiated by abnormal oxidative phosphorylation was one of the essential mechanisms of PNALD, and mitochondria-initiated oxidative stress may play an important role in this process.

**Disclosure of Interest:** None declared.

### MON-PO365 INCLUDING BODY COMPOSITION IN MELD SCORES IMPROVES MORTALITY PREDICTION AMONG PATIENTS AWAITING LIVER TRANSPLANTATION

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**Rationale:** The Model for End-stage Liver Diseases (MELD) is widely accepted for prioritizing candidates awaiting liver transplantation (LT). However, MELD scores do not reflect the severity of the nutritional or functional status of patients with cirrhosis.

**Methods:** This retrospective study analyzed data from 173 patients who were waitlisted for LT at our institution between April 2006 and December 2016. By including skeletal muscle mass, muscle quality and visceral adiposity evaluated using plain computed tomography imaging in MELD scores, we developed body composition-MELD (BC-MELD), and investigated its impact on the prediction of mortality among patients awaiting LT.

**Results:** The equation generated using Cox regression analysis was as follows:

BC-MELD = MELD score + 3.59 × low SMI + 5.42 × high IMAC + 2.06 × high VSR. (IMAC, intramuscular adipose tissue content; SMI, skeletal muscle mass index; VSR, visceral-to-subcutaneous adipose tissue area ratio). Waitlist mortality in patients with high BC-MELD was significantly higher in all tested cohorts ( $P < 0.001$ ) and among patients with lower conventional MELD scores ( $< 15$ ) ( $P < 0.001$ ). The discriminatory power was significantly better for BC-MELD than MELD scores ( $P = 0.001$  for 3-month,  $P = 0.002$  for 6-month,  $P < 0.001$  for 12-month,  $P = 0.014$  for overall mortality).

**Conclusions:** BC-MELD is the first to include not only muscularity but also visceral adiposity. It predicted waitlist mortality more accurately than the conventional MELD score. A new allocation system based on BC-MELD might lead to better outcomes for patients with cirrhosis awaiting LT.

**Disclosure of Interest:** None declared.



## Nutrition and cancer II

### MON-PO366

#### NUTRITIONAL SCREENING IN PATIENTS ADMITTED TO A ONCOHEMATOLOGIC UNIT

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**Rationale:** The PREDYCES study in Spain identified the impact of malnutrition related to disease, with a prevalence of malnutrition of 36% in oncohematological patients. In our hospital, until the beginning of this study, no nutritional screening had been performed in these patients. Our Unit of Clinical Nutrition and Dietetics attended patients on demand of their doctors when malnutrition was suspected. The goal of our study was to identify patients with nutritional risk at hospital admission in a Oncohematologic Unit and to assess the benefit of universal screening in this group of patients.

**Methods:** Prospective, longitudinal study. All patients older than 16 years with oncohematological diagnosis who entered from July 2018 to February 2019 (8 months) in the Hematology Service Plant of the M. Valdecilla Hospital were included in the study. Terminal patients were excluded. The Malnutrition Screening Tool (MST) tool was used for nutritional screening. In patients identified with nutritional risk, a complete nutritional assessment was carried out.

**Results:** 152 patients were included in the study. The median age of the patients was 61,49 years (range 16–96 y). 46.8% of the patients were women and 53,2% were men. MST identified 71 patients at nutritional risk (46.71%). A statistically significant difference was found between the body mass index (BMI) of the patients with nutritional risk (BMI 23,9 kg/m<sup>2</sup>) versus the patients without nutritional risk (BMI 27,2 kg/m<sup>2</sup>) ( $p < 0,05$ ). In the 8 months prior to the implementation of screening, only 35 patients were attended by our Nutritional Unit in the Hematology Service.

Hematologic malignancies in each group.

	Leukemia	Lymphoma	Multiple Myeloma	Others
NO RISK (81)	24	23	17	17
AT RISK (71)	19	26	11	15

**Conclusions:** Almost half of the patients admitted with oncohematological diseases were at nutritional risk using the MST as a screening tool. The type of hematologic malignancy did not predict the nutritional risk. Systematical nutritional screening detects double oncohematological patients at risk of malnutrition than on demand and justifies the implementation of this program. Identification of these patients allows an early nutritional intervention.

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**Disclosure of Interest:** None declared.

### MON-PO367

#### RELEVANCE OF BASELINE NUTRITIONAL STATUS ON THE EFFICACY OF A FAST-TRACK NUTRITIONAL CIRCUIT IN HEAD AND NECK CANCER PATIENTS UNDERGOING RADIOTHERAPY: THE SOONER THE BETTER

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**Rationale:** Head and neck cancer (HNC) patients undergoing radiotherapy (RT) have a high risk of malnutrition. The aim of this study was to evaluate the influence of baseline nutritional status on the efficacy of the fast-track circuit.

**Methods:** HNC patients referred to the fast track circuit (before RT) from 2014 to 2018 were included. Those with nasogastric tube previous to RT were excluded.

Baseline nutritional status was evaluated following Spanish nutrition society criteria (SENPE-SEDOM). Clinical evolution up to 3 months after finishing RT was compared between well-nourished and malnourished groups.

**Results:** 177 patients (83% men), mean age 61.9 years. 68.4% of subjects had advanced tumour state (IV) and 76.3% received concomitant chemotherapy. Table 1 shows baseline characteristics and evolution of both groups.

	Well-nourished (n = 120)	Malnourished (n = 57)	P
Baseline			
BMI (kg/m <sup>2</sup> )	26.4 ± 5.0	23.6 ± 3.8	0.0001*
Anorexia (%)	12.5	49.1	0.0001*
Dysphagia (%)	39.2	68.4	0.0001*
Daily intake:			
• Kcal:	2009	1629	0.0001*
• Protein (g):	81	66	0.004*
Oral supplements (%)	32.5	71.9	0.0001*
3-month follow up			
BMI (kg/m <sup>2</sup> )	24.3 ± 4.2	22.4 ± 4.9	0.036*
Weight loss (%)	-7.0 ± 8.6	-3.2 ± 9.0	0.018*
Oral supplements (%)	65.8	71.9	0.479
Nasogastric tube (%)	12.5	12.3	0.961
Death (%)	4.3	17.1	0.014*

\*Statistical significance:  $p < 0.05$ .

The Hazard ratio of death is 3.937 (95% CI 1.319–11.750).

**Conclusions:** The well-nourished group had a better evolution suggesting that malnutrition attenuates the benefits of the fast-track. Despite receiving an early and intense nutritional support (with more use of oral supplements at baseline and less weight loss during RT), malnourished patients had almost 4 times more mortality. Nutritional surveillance should be encouraged as soon as the HNC diagnose is suspected, to ensure that all patients start RT in the best possible nutritional status.

**Disclosure of Interest:** None declared.

### MON-PO368 NUTRITIONAL STATUS AND IMMUNONUTRITION IN PATIENTS INTERVENED FOR TOTAL LARYNGECTOMY FOR CANCER

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**Rationale:** In addition to administering the necessary nutritional requirements, immunonutrition aims to improve the immune status in order to minimize the response to surgical aggression.

**Objectives:** To assess the nutritional status in the perioperative period of laryngectomy in cancer patients and to analyze the possible repercussion of the immunomodulatory enteral diet in postoperative complications.

**Methods:** Retrospective study of patients undergoing total laryngectomy (2016–2018) in our hospital. Statistical analysis SPSS v.22.0.

**Results:** 40 subjects, 95% men, mean age 66.3 ± 11.48 years, 32.5% diabetics. All the patients had total enteral nutrition by nasogastric tube after surgery; 45% immunomodulatory formula.

Anthropometric-biochemical parameters before and after surgery: weight 79.1 ± 19.2 vs 75.2 ± 15.4 kg ( $p=0.033$ ), BMI 28.9 ± 6.8 vs 27.5 ± 5.5 kg/m<sup>2</sup> ( $p=0.034$ ), hemoglobin 14.0 ± 1.6 vs 11.3 ± 1.8 g/dl ( $p<0.001$ ), lymphocytes 1835.6 ± 928.8 vs 1432.3 ± 756.6/mm<sup>3</sup> ( $p<0.001$ ), proteins 7.1 ± 0.6 vs 6.1 ± 0.4 g/dl ( $p<0.001$ ), albumin 3.9 ± 0.4 vs 3.4 ± 0.7 g/dl, prealbumin 17.5 ± 12.0 vs 18.5 ± 2.1 mg/dl and transferrin 230 ± 50.4 vs 196 ± 30.4 mg/dl ( $p=NS$  in the last 3 parameters). The use of immunomodulatory formula is associated with higher levels of post-surgery pre-albumin (25.8 ± 10.9 vs 17.9 ± 7.6 mg/dl,  $p=0.012$ ), without differences in the rest.

The most common complication after surgery is pharyngocutaneous fistula (30%). The appearance of complications and mortality are not associated with enteral nutrition formula. Hospital stay is greater in cases with complications (31.2 ± 12.2 vs 17.7 ± 3.8 days,  $p<0.001$ ).

**Conclusions:** A worsening of nutritional status is experienced by most patients after surgery. In our series, the use of the immunomodulatory formula seems to be associated with higher levels of prealbumin compared to the standard formula, without differences in other parameters.

**Disclosure of Interest:** None declared.

### MON-PO369 THE EFFECT OF NUTRITIONAL COUNSELING ON MUSCLE MASS AND TREATMENT OUTCOMES IN PATIENTS WITH METASTATIC COLORECTAL CANCER UNDERGOING CHEMOTHERAPY: A RANDOMIZED CONTROLLED TRIAL

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**Rationale:** A low muscle mass and loss of muscle mass during chemotherapy is related to adverse outcomes in patients with cancer. In this randomized controlled trial, the effect of nutritional counseling on change in muscle mass and treatment outcomes in patients with

metastatic colorectal cancer during first-line chemotherapy was studied.

**Methods:** Patients scheduled for first-line chemotherapy ( $n=107$ ) were randomly assigned to individualized nutritional counseling by a dietitian (NC) or usual care (UC). NC was aimed at sufficient protein- and energy intake, supported by oral supplements or enteral feeding in indicated. Furthermore, physical activity was encouraged. Outcomes were assessed at baseline (T0) and the time of the first (T1) and second (T2) regular follow-up computed tomography scans. The proportion of patients with a clinically relevant decrease in skeletal muscle area of  $\geq 6.0$  cm<sup>2</sup>, measured by computed tomography, was the primary outcome. Secondary outcomes included body weight, quality of life, treatment toxicity and progression free and overall survival.

**Results:** Between 2013 and 2018, 107 patients were randomly assigned to NC ( $n=52$ ) or UC ( $n=55$ ). The proportion of patients with  $\geq 6.0$  cm<sup>2</sup> decrease in skeletal muscle area of did not differ (NC 30% versus UC 31%,  $p=0.467$ ). NC compared with UC had a significant positive effect on body weight (B coefficient 1.7,  $p=0.045$ ), progression free survival ( $p=0.039$ ) and overall survival ( $p=0.046$ ).

**Conclusions:** NC of patients undergoing chemotherapy for metastatic colorectal cancer did not have an effect on muscle mass. However, we found that NC may increase body weight and may improve progression free survival and overall survival compared to UC in this group of patients. Future trials powered on survival should confirm the beneficial effect of NC and will have to investigate the mechanism whereby survival may be improved.

**Disclosure of Interest:** None declared.

### MON-PO370 PLASMA LEVEL CITRULLINE UNDERGOING HEMATOPOIETIC STEM CELL TRANSPLANTATION

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**Rationale:** Plasma citrulline has been proposed as a marker of intestinal epithelial damage following myeloablative therapy ( $\leq 20$   $\mu\text{mol/L}$ : intestinal insufficiency and  $\leq 10$   $\mu\text{mol/L}$ : villus atrophy).<sup>(1)</sup> Furthermore, levels  $\leq 26$   $\mu\text{mol/L}$  before hematopoietic stem cell transplantation (HCT) was associated with acute graft vs host-disease and non-relapse mortality.<sup>(2)</sup>

Our objective was to analyse plasma citrulline levels during HCT in our centre.

**Methods:** Prospective observational study of patients undergoing HCT during 2015–2018. Data (age, gender, transplant type, diagnosis, citrulline and blood samples) were collected at days (–7)(+7)(+14) and 2 weeks after discharge (AD) of the HCT. Patients received nutritional treatment according to usual clinical practice of our centre. Plasma citrulline levels were assessed using liquid chromatography combined with mass spectrometry (normal levels 40 ± 10  $\mu\text{mol/L}$ ). The results are expressed in median [interquartile range] and frequencies. Wilcoxon test using IBM-SPSS21.0<sup>®</sup>

**Results:** We studied 39 patients (51% men; median age 52[42–63] years) who underwent HCT (65.8% allogeneic). The median stay was: 32[28–39] days. Citrulline levels varied significantly during the study (even adjusted by gender, transplant type, diagnosis, PCR and kidney failure) (Table 1). At admission, 40.5% of the patients had citrulline levels  $\leq 26$   $\mu\text{mol/L}$ .

**Table 1**  
Plasma citrulline levels during the study.

	-7	+7	+14	AD	p
Median	26.7	10.3	12.4	18.1	<0.001
[interquartile range]	[22.9–33.2]	[8.3–15.9]	[9.9–17.4]	[16.4–24]	
N° with Cit ≤ 10 μmol/L (%)	2(5%)	15(43%)	9(26%)	0	0.001
N° with Cit ≤ 20 μmol/L (%)	5(13%)	32(91%)	27(79%)	19(61%)	<0.001

**Conclusions:** In our series, patients undergoing HCT had citrulline levels at admission below normal range, and almost in half of them citrulline levels were ≤26 μmol/L. This has been associated with an increased risk of complications.

Minimum levels were reached one week after transplant (43% in the range of villous atrophy) and remained low even after two weeks of hospital discharge. These data should be considered when managing patient's nutritional treatment.

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**Disclosure of Interest:** None declared.

#### MON-PO371 ASSOCIATION BETWEEN FTO GENE POLYMORPHISMS AND BREAST CANCER: A SYSTEMATIC REVIEW

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**Rationale:** It has recently been reported that the fat mass and obesity-associated (FTO) gene is associated with cancer risk. The aim of the current research is to systematically investigate the conducted research studies on the association between FTO gene polymorphisms and breast cancer.

**Methods:** In this study all of the case-control studies associated with cancer and FTO gene polymorphisms were gathered from Pubmed, Science Direct, Scopus, and Cochran databases and assessed independently by 2 researchers. Key words such as breast cancer and/or FTO and/or polymorphism were used in order to identify related articles. Exclusion criteria included studies unrelated to the FTO gene and unrelated to the outcome of breast cancer

**Results:** In accordance with our criteria, 12 studies were included into this systematic review. Of these studies, 7 investigated the association between rs99396096 polymorphism and breast cancer, 4 studies investigated the association between rs1477196 polymorphism and breast cancer, 3 studies investigated the association between rs11075995 polymorphism and breast cancer, and 2 studies investigated the association between rs17817449 polymorphism and breast cancer. The association between FTO gene polymorphisms and cancer were significantly different between different studies.

**Conclusions:** FTO genotype may play an important role in breast cancer. The association between FTO gene polymorphisms and cancer differs from one study to another, which may be due to the complexity of the subject matter and the impact of various factors on it.

**Disclosure of Interest:** None declared.

#### MON-PO372 THE EFFECTS OF GENE POLYMORPHISMS OF METABOLIC ENZYMES ON THE ASSOCIATION BETWEEN RED AND PROCESSED MEAT CONSUMPTION AND THE DEVELOPMENT OF COLON CANCER; A LITERATURE REVIEW

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**Rationale:** The role of environmental factors and genetic susceptibility in the development of colon cancer (CC) has been already proven, but the role of gene polymorphisms in modifying the risk of environmental factors such as nutritional factors is still unknown

**Methods:** This review study was carried out using keywords such as polymorphism and/or protein and/or red meat and/or processed meat and/or colon cancer PubMed and Science Direct Databases were used to collect all related articles published from 2001 to 2017.

**Results:** The presence of single-nucleotide polymorphisms in the coding genes of proteins involved in metabolism of nutrients could play significant roles in the extent of the effects of nutrition in the development of CC. The effect of dietary proteins greatly depends on the polymorphisms in the metabolizing genes of these substances. Gene polymorphisms may have a role in CRC risk, especially in people with high meat intake. and this leads to a difference in the effects of meat consumption in different individuals.

**Conclusions:** Dietary recommendations for the prevention and control of CC should be modified based on genotype in different individuals. Increasing our knowledge on this field of nutritional genomics can lead to personalized preventive and therapeutic recommendations for CC patients

**Disclosure of Interest:** None declared.

#### MON-PO373 ANOREXIA OVERCOMING IN PATIENTS WITH CYTOSTATIC THERAPY AND HEMATOPOIETIC STEM CELL TRANSPLANTATION

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**Rationale:** Cytostatic therapy and hematopoietic stem cell transplantation (HSCT) is often associated with gastrointestinal toxicity, including anorexia, which leads to protein-energy malnutrition and ultimately cachexia – factor associated with high mortality. We evaluated clinical efficacy of existing appetite stimulants in cytostatic therapy and HSCT.

**Methods:** Since 2014, 99 patients with malignancy (n = 83) and other diseases (n = 16) treated with allogeneic HSCT (n = 75), cytostatic therapy (n = 24) were enrolled to the prospective study. Median age was 20.6 years (0.2–76 years). Appetite stimulant therapy was carried out in 58 patients – megestrol acetate (Megace, Bristol-Myers Squibb, USA) 40–320 mg/day (0.8–13.3 mg/kg) orally; 19 patients – levocarnitine (Elkar, PEAK-Pharma, Russia) – 0.3–0.9 g/day orally. Patients in control group (n = 22) received prednisolone 1–2 mg/kg/day as part of graft-versus-host disease (GvHD) therapy, for whom appetite elevation is a common side-effect. Clinical effectiveness was evaluated 1 month after therapy was started.

**Results:** Appetite stimulants had provoked appetite in 79.3% (n = 46) patients in megestrol acetate group, p = 0.0001; 63.6%



(n = 14) – prednisolone, p = 0.0001; 22.2% (n = 4) – levocarnitine. Body mass increase was observed in 81% (n = 47) of patients with megestrol acetate (p = 0.05) and in 50% (n = 11) with prednisolone (p = 0.05), levocarnitine – 15.8% (n = 3). Initial nutritional status, GvHD didn't affect appetite stimulants effectiveness, p = 0.3, respectively. Prednisolone treatment was associated with more frequent rate of complications – 31.8% (n = 7), p = 0.0001; megestrol acetate (n = 1) and levocarnitine (n = 1).

**Conclusions:** Low-dose megestrol acetate is a safe and effective option for anorexia treatment in patients after HSCT and cytostatic therapy. Prednisolone was less effective, moreover it was accompanied with metabolic alterations.

**Disclosure of Interest:** None declared.

#### MON-PO374

##### A COMPARISON OF EARLY ENTERAL FEEDING VIA NASOJEJUNAL VERSUS NASOGASTRIC TUBES IN ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANTATION – RESULTS OF A TWO-CENTER NUTRITIONAL INTERVENTION TRIAL

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**Rationale:** Allogeneic hematopoietic stem cell transplantation (allo-HSCT) is associated with inadequate oral food intake. Enteral nutrition (EN) is more appropriate in comparison with total parenteral nutrition, but is difficult to provide due to gastrointestinal toxicity and graft versus-host-disease. The aim of the study was to compare nasojejunal (NJ) versus nasogastric (NG) tube feeding in recipients of allo-HSCT.

**Methods:** Allo-HSCT recipients (n = 69) with myeloablative conditioning (MAC) were enrolled in a randomized controlled trial comparing optimized energy and protein intake with routine hospital nutritional support. A NJ tube (Flocare Bengmark Ch8, Nutricia or Freka Endolumina 10 Fr, Fresenius Kabi) (Norwegian arm) and a NG tube (Flocare Pure Ch8) (Russian arm) were inserted within 5 days after allo-HSCT. A semi-elemental formula (Nutrison Advanced Peptisorb, Nutricia) was started at 15 ml/h and increased to maximum 100 ml/h.

**Results:**

Tube type tolerance and outcome			
	Nasojejunal	Nasogastric	P-value
Variables	(n = 55)	(n = 14)	
Days in position, median, range	7 (1–34)	5 (1–14)	0.05
Maximum infusion rate, ml/h	53 (20–100)*	27 (20–50)	0.001
Reduced infusion rate due to:			
nausea	13 (27.1)*	2 (14.3)	0.48
diarrhea	6 (12.5)*	1 (7.1)	1.00
bloating	7 (14.6)*	-	-
Gastric residual volume, ml	-	80 (31–187)	-
Removed adequate oral energy intake	7 (12.7)	-	-
Poorly tolerated	16 (29.1)	8 (44.4)	0.05
Vomited tube	19 (34.5)	2 (14.3)	0.20
Fall out	8 (14.5)	-	-
Others	5 (9.1)	-	-

Values are numbers (%) unless otherwise stated, \*NJ feeding was started in 48/55 (87.3%) patients.

**Conclusions:** NJ feeding was better tolerated compared to NG feeding, but was associated with high risk of tube loss. Semi-elemental formula was well-tolerated and could be recommended for patients with high risk of gastrointestinal toxicity in allo-HSCT after MAC.

**Disclosure of Interest:** None declared.

#### MON-PO375

##### THE RELATIONSHIP BETWEEN PARENTERAL NUTRITION AT HOME AND QUALITY OF LIFE AND CATHETER INFECTIONS

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**Rationale:** Indications for treatment of parenteral nutrition (PN) at home remain controversial. High rates of infection are reported in patients receiving PN support at home. The aim of the present study was to investigate the effect of home PN application on catheter-related infection rates with the support of an experienced home nurse.

**Methods:** The PN indication at home was determined according to the European Society for Clinical Nutrition and Metabolism guideline. Patients >18 years old were included in the study. Before PN support was given at home, complying with asepsis rules for 2–5 days, the patients and their relatives were trained on the preparation and insertion of the feeding bag, catheter care, complications that may occur. The visits were made by an experienced nurse 2 days/week at home. Short form Health Survey-36 and Karnofsky quality of life tests were applied to all patients and patients were evaluated for catheter infection and other complications.

**Results:** Seventeen (nine male and eight female) patients were included in the study. The median age of the patients was 61 (40–80) years. Fourteen patients had PN support due to malignancy, and two patients had short bowel syndrome. The median body mass index was 20.7 (13–30) kg/m<sup>2</sup>, whereas the median Nutritional Risk Screening-2002 score was 4 (3–6). The median follow-up period was 47 (0–155) days. Of the 17 patients, 3 died after the first home visit after being discharged from the hospital. One patient was excluded from the study because she did not want to come home after her basal evaluation was made. At the end of the study, 15 patients died. PN support was discontinued in two patients who started to take it orally. One patient was hospitalized on day 63 of PN administration at home due to catheter-related infection. One patient had port obstruction due to PN support. In total, PN support with catheter was found as 811 days. The rate of catheter infection was 1.23 in 1000 catheter days.

**Conclusions:** In our study, the rate of infection was found to be significantly low in patients who were followed up with PN support at home with the help of an experienced nurse.

**Disclosure of Interest:** None declared.

#### MON-PO376

##### THE USE OF BIOLOGICALLY-BASED COMPLEMENTARY MEDICINES IN PATIENTS WITH NEUROENDOCRINE TUMOURS

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**Rationale:** Biologically-based complementary medicines (BB-CMs) are popular in patients with cancer. However, there are only limited data for BB-CMs in patients with neuroendocrine tumors (NET). We

aimed to identify the prevalence and type of BB-CM use and the association to the nutritional risk score (NRS-2002) in NET patients.

**Methods:** We performed a cross-sectional questionnaire study in NET outpatients at the department of Hepatology and Gastroenterology at Aarhus University Hospital. The nutritional risk was determined by the NRS-2002.

**Results:** We included 186 patients (51% women, median age 66 years). Sixty-six percent were regular BB-CM users. Forty-two percent used at least two supplements. The most popular BB-CMs were vitamin and mineral supplements (47%), calcium and vitamin D (34%). One-third used non-vitamin non-mineral supplements like fish oil, herbs, Ginger, Q-10, garlic and probiotics. The use of BB-CMs was associated with female gender (48% vs 37%,  $p < 0.05$ ). Intake was significantly more frequent among patients with an NRS score  $\geq 3$ , (60% vs 76%) and in patients with impaired level of function (58% vs 76%), ( $p < 0.05$ , all). Patients reporting dietary changes used BB-CMs more frequently than patients without dietary changes (61% vs 77%), ( $p < 0.05$ ).

**Conclusions:** In our study, 66% percent of NET patients use BB-CM and 42% used two or more supplements. Vitamins with and without herbal ingredients, minerals, calcium, vitamin D and fish oil were the most popular supplements. The use of BB-CMs was associated with an NRS score  $\geq 3$ , change in food intake, female gender and impaired level of function.

**Disclosure of Interest:** None declared.

#### MON-PO377

##### ARE BODY COMPOSITION PARAMETERS ASSOCIATED WITH THE CLINICAL OUTCOME OF PATIENTS WITH ADVANCED PANCREATIC CANCER RECEIVING FLUOROPYRIMIDINE-BASED CHEMOTHERAPY?

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**Rationale:** Pancreatic cancer (PC) is one of the most aggressive cancer with 80% metastatic disease at diagnosis and a high 5 year-mortality rate (95%). Fluoropyrimidin based chemotherapy is one of standard treatment with the best efficiency but also with more toxicity. Impact of body composition (BC), including impaired muscle mass, specifically in advanced PC is still debated. The aim of our study was to determine impact of different BC parameters on PC prognosis and Folfirinox toxicity.

**Methods:** All patients treated by Folfirinox as a metastatic first line for advanced PC between 2007 and 2015 at a French Cancer Center were retrospectively analysed. BC was assessed by CT scan at the third lumbar level. Images from CT scan were analysed with ImageJ software (National Institutes of Health, Bethesda, MD, USA). Impaired muscle mass was defined using skeletal muscle index (SMI) ( $< 52.4 \text{ cm}^2/\text{m}^2$  for males and  $38.5 \text{ cm}^2/\text{m}^2$  for females). Psoas muscle (PMI), visceral adipose tissue (VAI), subcutaneous adipose tissue (SAI), intramuscular fat index were collected. Kaplan Meier analyses and the cox proportional hazard ratio were used to compare effect of BC on overall survival (OS) and progression free survival (PFS). Chi-square or Fisher exact test were used to compare chemotherapy toxicity.

**Results:** Data from 137 patients with PC were enrolled. Among them 91 had a baseline CT scan available and were included in analyses. Mean age was  $60.7 \pm 9.2$  years old. Cancer was locally advanced in 42% of cases and metastatic in 58%. Mean SMI was  $48.6 \pm 7.03 \text{ cm}^2/\text{m}^2$  for males and  $36.9 \pm 6.0 \text{ cm}^2/\text{m}^2$  for females. Impaired muscle mass was observed in 64% ( $n = 58$ ) of patients. Neither impaired muscle mass nor other BC parameters (except for intrapsoas fat index) were significantly associated with OS or PFS. However, performance status (HR = 0.42 [0.20;0.85],  $p = 0.015$ ), first intent surgery (HR = 0.55 [0.32;0.93],  $p = 0.03$ ), liver metastasis (HR = 2.62 [1.59; 4.32],  $p < 0.001$ )

and intrapsoas fat index (HR = 0.52 [0.29; 0.95],  $p = 0.03$ ) were independent predictive factors of mortality. The lower quartile of SMI was associated with more vomiting:  $n = 12/22$  (54.5%) vs  $n = 15/62$  (24.2%),  $p = 0.016$ . Patients with the highest quartiles of SAI or VAI had significantly more grade 3 haematological toxicity than the lowest (35% vs 4.8%,  $p = 0.009$ ; 34% vs 9%,  $p = 0.028$ , respectively).

**Conclusions:** In this study, there is no relation between BC parameters including muscle mass and prognosis in locally advanced or metastatic PC. Nevertheless, a low SMI, a high SAI or VAI is associated with more severe toxicity of chemotherapy. Other studies should be performed to evaluate whether a targeted nutritional care could improve tolerance of chemotherapy.

**Disclosure of Interest:** None declared.

#### MON-PO378

##### DOES ENTERAL FEEDING IMPROVE OUTCOME OF MICE WITH CARCINOMATOUS PERITONITIS?

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**Rationale:** Cancer causes systemic inflammation and malnutrition. Particularly, at the end stage of cancer, the amount of oral food intake may be markedly reduced. Although avoidance of malnutrition is essential for the maintenance of host immunity against hostile microbes and cancer cells, parenteral feeding under such condition is not recommended in clinical guidelines. On the other hand, because enteral nutrition may enhance host immunity, tube feeding might improve outcome of animals with advanced cancer when oral intake is diminished.

**Methods:** Male C57BL/6J mice ( $n = 21$ ) underwent gastrostomy and were inoculated PancO2 cancer cells ( $1 \times 10^6/\text{body}$ ) i.p. on day 8 after the operation. Then, all mice were fed normal chow and water *ad libitum* until day 29. Because our previous study showed body weight loss and oral intake reduction from day 29, we randomly divided the mice into 2 groups: (CHOW ( $n = 10$ ) and SED ( $n = 11$ )) on day 29. The CHOW group was allowed to take the chow and water *ad libitum* throughout the study period, whereas the SED group received continuous tube feeding of a standard enteral diet at the rate of 0.48 kcal/h without oral food intake from day 29. Survival was observed until day 43 and survival time was analyzed using log rank test.

**Results:** Autopsy of the dead mice revealed progression of cancer peritonitis in the 2 groups. Obstruction of GI tract due to cancer peritonitis was not observed. Survival time was  $33.2 \pm 1.6$  in the CHOW and  $28.3 \pm 1.2$  in the SED group (days, mean  $\pm$  SE group,  $p = 0.03$ ).

**Conclusions:** Aggressive enteral feeding may be disadvantageous in the advanced cancer peritonitis.

**Disclosure of Interest:** None declared.

#### MON-PO379

##### IMPACT OF BODY MASS INDEX ON SURVIVAL IN ADULT PATIENTS WITH B CELL PRECURSOR ACUTE LYMPHOBLASTIC LEUKEMIA

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**Rationale:** To identify the association of body mass index on survival in adult patients with B Cell Precursor Acute Lymphoblastic Leukemia.

**Methods:** A retrospective, observational study was performed in patients with acute lymphoblastic leukemia of lineage B Ph + (-). All cases with genetic alterations of poor prognosis or with adverse phenotypic alterations (ALL-MyL) were excluded. BMI was calculated at the time of diagnosis. We studied the association of the different clinical risk factors (leukocyte count, age, risk) with BMI. Survival curves were performed using the Kaplan-Meier method; the differences between the groups were identified by the log-rank test. The impact of the variables on the forecast was identified by the Cox regression analysis.

**Results:** A total of 128 patients with diagnosis of de novo lymphoblastic leukemia who initiated induction chemotherapy protocol for remission were studied. The mean age was 32 years (16–68 years), being higher for females (36 years and 28 years), this difference being statistically significant ( $p = 0.000$ , 95% CI). When classifying the cases according to age, most of the patients were under 35 years old ( $n = 84$ , 65.6%), being mostly male cases (74.7% and 52.8%). BMI was obtained at the diagnosis, they were classified with a normal weight 34.4%, overweight, 18.8% obesity grade I, and 3.9% obesity grade III. The mean follow-up was 393 days (10–1216 days), with an average survival of 57.8% at 600 days of follow-up. In the multivariate analysis of the clinical variables (age, leukocytes and global risk), only age showed a significant impact on both overall survival ( $p = 0.045$ , 95% CI) and for disease-free survival ( $p = 0.054$ ), 95% CI). When analyzing the BMI, overweight (25–29.9 kg/m<sup>2</sup>) and obesity ( $\geq 30$  kg/m<sup>2</sup>) on overall survival, we found no direct no association between this variable on overall survival ( $p = 0.640$ , 95% CI) as in disease-free survival ( $p = 0.527$ , 95% CI).

**Conclusions:** Body mass index was not associated on overall survival and a disease-free survival in patients with b-cell precursor Acute Lymphoblastic Leukemia. Further studies analyzing body composition are recommended.

**Disclosure of Interest:** None declared.

#### MON-PO380 SCREENING FOR NUTRITIONAL STATUS IN RADIATION ONCOLOGY OUTPATIENTS

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**Rationale:** This cross-sectional study, aimed to determine nutritional status among oncology outpatients, was conducted in collaboration with Turkish Society of Radiation Oncology as an awareness-raising project within the context of World Nutrition Day.

**Methods:** A total of 394 oncology outpatients were screened for nutritional status via NRS 2002 during their admission to 12 radiation oncology centers across Turkey in October 2018. Patients with NRS 2002 scores  $\geq 3$  were considered to be at risk of malnutrition necessitating the provision of nutritional intervention.

**Results:** The most common diagnosis was head and neck carcinoma (23.4%), as followed by gastrointestinal (20.8%), breast (14.0%), prostate (12.4%) and lung (12.2%) cancer. Overall, 78.9% of patients were newly diagnosed. NRS 2002 assessment (scores  $\geq 3$ ) revealed 133(33.8%)

patients to be at risk for malnutrition. Highest rates for malnutrition risk were noted for patients with lung cancer (43.8%), head and neck cancer (43.5%), gastrointestinal tumors (42.7%), and gynecologic cancer (33.3%). Poor nutritional status was evident in 36.0% and 25.3% of newly diagnosed and formerly diagnosed patients, respectively.

**Conclusions:** This screening study revealed malnutrition risk and need for nutritional intervention in 33.8% of cancer patients, including 36.0% of newly diagnosed patients. Our findings emphasize that nutritional intervention should be implemented in two out of every five patients with newly diagnosed cancer, particularly for those with lung cancer, head and neck cancer and gastrointestinal tumors. Accordingly, screening for nutritional risk in every cancer patient during the early treatment period seems crucial, given the likelihood of being already at risk of malnutrition at the time of initial diagnosis and the role of appropriate multimodal nutritional intervention prior to anti-cancer therapy in the long-term success.

**Disclosure of Interest:** None declared.

#### MON-PO381 COMPARISON OF NUTRITIONAL ASSESSMENT TESTS IN ONCOLOGY PATIENTS

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**Rationale:** Malnutrition is very common for among the cancer patients. Treatment modalities that are used to management of disease can cause worsening of malnutrition. This can affect the success of treatment. In this regard, it is very critical to assess nutritional status of the patients properly and start early nutritional support to high risk group for achievement of treatment. Nutritional status can be evaluated by different tests. Still, there is no consensus for that. However, subjective global assessment (SGA) and nutritional risk scanning (NRS-2002) are generally preferred by most of the physicians. We aimed to compare the effectiveness of SGA and NRS-2002 to predict to malnutrition risk for lung cancer patients.

**Methods:** 37 patients were evaluated with both SGA and NRS-2002 tests by same physician before beginning of definitive treatment for lung cancer or head and neck cancer in Radiation Oncology Departments. Prediction values for malnutrition for both tests statistically compared with chi-square test. Cohen's kappa value is used to assess compatibility of two tests.

**Results:** Median age was 58.5 years old. SGA test detected malnutrition risk for 18 patients (%48.6), while NRS-2002 had detected for only 9 patients (%24.3) at same group. There is a statistically significant difference between two tests for detection of malnutrition ( $p = 0.005$ ). Cohen's kappa value showed low level compatibility (0.397). When we assumed that SGA is the reference test, sensitivity and specificity ratios for NRS-2002 calculated as %94 and %11 respectively. Negative predictive value (NPV) was %50 and positive predictive value (PPD) was %67 according to assumption.

Cohen's kappa value calculated as 0.56, which means intermediate level compatibility between two tests, when patients older than 65 years old evaluated among themselves. There is no statistically significant difference for these two tests in patients that are older than 65 years old ( $p = 0.25$ ).

**Conclusions:** There is a statistically significant difference between NRS2002 and SGA tests for detection of malnutrition. But there is no statistically significant difference for these two tests in patients that are older than 65 years old. Further attention should be given to detect malnutrition in oncology group.

**Disclosure of Interest:** None declared.



### MON-PO382 NEW POSTOPERATIVE DIET STRATEGY TO PREVENT MALNUTRITION IN PANCREATECTOMIZED CANCER PATIENTS

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**Rationale:** Due to the metabolic and pathophysiological changes that accompany cancer, post-pancreatectomy cancer patients often exhibit a high risk of malnutrition, mainly caused by weight loss and trouble eating (decreased appetite, indigestion, or early satiety). This study proposes a new postoperative diet strategy developed to address these issues.

**Methods:** A retrospective analysis study was conducted on 25 patients who underwent pancreatectomy from November 2016 to May 2018 at Severance Hospital in Seoul. Subjects were categorized into two groups, 15 individuals in the 'Regular Diet Group' and 10 individuals in the 'Experimental Diet Group.'

The 'Regular Diet Group' abstained from food or drink (NPO) prior to surgery and followed a clear liquid diet (520 kcal/1300 ml), full liquid diet (1200 kcal/1900 ml), then soft diet (1600 kcal/2600 ml) following the procedure.

The 'Experimental Diet Group' followed a shortened NPO period by consuming a carbohydrate-rich drink both before and after surgery. Post-surgery, the period for patients following a low-calorie liquid diet (350 kcal/710 ml), with which patients exhibit a lack of compliance, was limited to a day or less. Instead, their soft diet was separated into step 1 (1100 kcal/1300 ml) and step 2 (1600 kcal/2100 ml), with caloric density increased using high calorie and high protein foods and oral nutritional supplements. Furthermore, snacks were provided in between meals a total of three times to promote frequent, light consumption of calories.

Caloric intake was recorded everyday and weight data were collected through EMR records. CAN.pro 4.0 was used for nutritional analysis and SPSS ver.23 was used for statistical analysis.

**Results:** There were no significant differences in age, gender, weight pre- or post-operation or pre-operation BMI between the two groups. The 'Regular Diet Group' consumed 27% of the calories provided, while the 'Experimental Diet Group' consumed 49%. The 'Experimental Diet Group' showed a significant increase in caloric intake ( $p = .007$ ). The 'Regular Diet Group' consumed 43% of the required calories per patient, while the 'Experimental Diet Group' consumed 57%, but there was no statistically significant difference between the two groups ( $p = .161$ ). The 'Regular Diet Group' showed a significant ( $p = 0.04$ ) decrease of  $-3.2\%$  in weight. The 'Experimental Diet Group' showed a decrease of  $-2.8\%$  in weight, which was not significant ( $p = .097$ ).

**Conclusions:** The 'Experimental Diet Group' exhibited an increase in caloric intake and a low rate of weight loss, which demonstrates functional significance of this diet in improving the nutritional status of post-pancreatectomy cancer patients.

**Disclosure of Interest:** None declared.

### MON-PO383 A COLLABORATIVE PROJECT TO CO-DESIGN A PREHABILITATION PROGRAM FOR PEOPLE WITH GASTROINTESTINAL CANCER RECEIVING CHEMOTHERAPY

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**Rationale:** Prehabilitation originates in surgery where its use can reduce morbidity and improve health outcomes.<sup>1</sup> It is now evolving as an intervention to minimise the deconditioning experienced during chemotherapy. Personalisation and patient experience are key factors to adherence to interventions and its success. Improving experience through co-design may be the key to designing an optimal service.<sup>2</sup>

**Methods:** A single-site service evaluation was undertaken using an experience-based co-design approach.

Eligible participants:

- Adults with gastrointestinal cancer who received chemotherapy, along with their carers, if they had seen one more therapists (dietitian, occupational therapist, physiotherapist, psychological support) between 01.04.16–31.03.17
- Staff with three months experience working in the service.

#### Objectives:

1. Explore staff and patient experiences of the current ad-hoc service and their recommendations for improvement
2. Co-design a prehabilitation intervention to improve the experience of people starting chemotherapy.

**Results:** Eleven interviews were filmed and twelve interviews transcribed. Thematic analysis was undertaken and a film and staff experience presentation were shared at a joint event.

#### Experience of ad-hoc service:

Staffs' specialist knowledge, friendliness and compassion was valued but they struggled to remember their roles. It was important to have time and space to ask questions. People wanted seamless care and an opportunity to interact and share their experiences.

Supporting people to self-manage was a key priority. Staff wanted to offer holistic care and address service inequalities, particularly access. Therapists felt their roles were poorly understood.

The work was prioritised together and nutrition, physical activity and emotional well-being co-design groups were formed.

#### Co-design recommendations for a new prehabilitation service:

- Ensure people understand its importance
- Use as non-medical environment as possible
- Offer groups for peer support and reciprocal learning
- A personalised plan is needed
- Critical points for support, especially emotionally, are diagnosis and discharge
- Minimise hospital visits

**Conclusions:** Experience-based co-design is an innovative framework. It facilitates the uncovering of experience and design of interventions that meet the needs of people with cancer and staff, thereby improving quality. This prehabilitation model has been used for business planning and the novel ideas, e.g. app use, for research for patient benefit applications.

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**Disclosure of Interest:** None declared.

### MON-PO384 ADMINISTRATION OF PARENTERAL NUTRITION TO TERMINALLY ILL CANCER PATIENTS. PRELIMINARY DATA FROM ONE YEAR'S REVIEW OF CLINICAL PRACTICE IN A HOSPITAL CLINIC OF INTERNAL MEDICINE.

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**Rationale:** Given the bibliographic controversy regarding the use of total parenteral nutrition (TPN) in end stage cancer patients, the aim of the present retrospective study is to review the clinical practice in a hospital clinic of internal medicine, where these patients were admitted for supportive care.

**Methods:** Data concerning patients hospitalized during 2018, with a diagnoses of end stage cancer, were analyzed anonymously by excel and spss, and in total accordance with current legislation derived from General Data Protection Regulation (GDPR).

**Results:** 98 adult patients of an average age of 62 years old were admitted in the hospital clinic for supportive care. The average length of stay (ALOS) was 31 days, while death was the hospitalization's outcome in the majority of cases. 30 patients out of 98 were regularly administered TPN, 12 with a malignancy located in the gastrointestinal tract. 10 of these were already being administered TPN at the time of their admission. Disconnection of TPN occurred in 3 cases due to complications. Only 5 out of 30 patients under TPN, survived more than 2 months.

**Conclusions:** Data analysis shows that there has not been an exaggeration concerning TPN's administration in that group of patients, even if they were characterized by extremely limited autonomy and physical activity. Once a decision for TPN administration has been made, a consequent disconnection is difficult to occur, unless a severe clinical complication happens. No difference was observed regarding the type of tumor and the need of TPN use.

**Disclosure of Interest:** None declared.

#### MON-PO385

##### CAN PHASE ANGLE BE CONSIDERED A MARKER OF MUSCLE STRENGTH IN COLORECTAL CANCER PATIENTS?

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**Rationale:** Phase angle (PA) is a well-known marker of muscle mass, but only recently it has been also considered a marker of muscle quality. Its applicability as a marker of muscle quality in patients with cancer has not yet been investigated. Therefore, we aimed to investigate the association between muscle function with measures of skeletal muscle mass and muscle quality from computed tomography (CT) and PA in colorectal cancer patients.

**Methods:** The skeletal muscle mass and quality were estimated as skeletal muscle index (SMI) measured by CT at the third lumbar vertebra and by muscle attenuation (MA), respectively. PA was obtained from the raw measurements of resistance and reactance from bioelectrical impedance analysis. Muscle strength was evaluated as handgrip strength (HGS) using dynamometer. Body mass index (BMI) and patient-generated subjective global assessment (PG-SGA) were also assessed. Multiple linear regression models were constructed to investigate the association between HGS (log transformation) and measures of skeletal muscle mass (SMI), muscle quality (MA and PA), BMI, age and sex using backwards stepwise regression.

**Results:** This study included 190 colorectal cancer patients, with a mean age of  $60 \pm 11$  years, 62% were overweight/obese and 69% were well-nourished by the PG-SGA. Sex explained more than half of the variability of HGS ( $R^2 = 0.51$ ), PA explained 25% ( $R^2 = 0.25$ ), SMI 22% ( $R^2 = 0.22$ ), MA 17% ( $R^2 = 0.17$ ) and age 5% ( $R^2 = 0.05$ ) ( $P \leq 0.001$ ). Multivariate regression analysis revealed that, after adjustment for sex, only PA was independently associated with HGS and augments in 12% the expected value of HGS ( $R^2 = 0.62$ ;  $P < 0.001$ ).

**Conclusions:** After adjustment for sex, as a confounder variable, only PA stayed independently associated with HGS. These results may suggest that PA could be a marker of muscle quality and strength in this subset of patients.

**Disclosure of Interest:** None declared.

#### MON-PO386

##### FISH OIL SUPPLEMENTATION IN CANCER PATIENTS. CAPSULES OR NUTRITIONAL DRINK SUPPLEMENTS? A CONTROLLED STUDY OF COMPLIANCE.

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**Rationale:** Fish-oil, rich in n-3 LC PUFAs may in high doses inhibit the development or progression of cancer cachexia. However, poor compliance may limit positive effects and lead to inconsistent results. We aimed to investigate acceptability and compliance to a nutritional drink with fish-oil or an equivalent dose of fish-oil administrated as capsules in patients receiving chemotherapy for GI tract cancers. In addition, if one type of supplement was superior with respect to nutritional status and side effects and, if n-3 LC PUFAs affect leukocyte and platelet counts, markers of dose-limiting toxicities of chemotherapy.

**Methods:** We consecutively included 41 patients with advanced cancer in the controlled study. Patients were advised to take either 10 capsules/day for four weeks. 400 mL/day of a nutritional drink was used for comparison. Compliance was assessed by daily self-registered product consumption and n-3 LC PUFAs in whole blood. Side effects were assessed using 10 cm visual analogue scales.

**Results:** Compliance and daily consumption of n-3 LC PUFAs were 96.4% (94.1–99.3) and 4.8 (4.7–4.9) g/day in the capsule group and 80.8 (55.4–93.6) % and 4.0 (2.8–4.7) g/day in the juice group, respectively ( $p \leq 0.02$ ). We found no differences between the groups with respect to changes in weight, nutritional status, acceptability or side effects. However, in the capsule group the whole blood n-3 LC PUFAs correlated negatively with the increase in nausea ( $r_s = -0.39$ ,  $p = 0.05$ ). Nausea, reduced appetite and loose stools were of great importance in deviations from recommended daily doses. Product evaluations showed that the number of capsules had a negative impact on acceptability and compliance, whereas this was mainly related to taste and consistency in the nutritional drink group. No changes in median thrombocyte or leukocyte blood counts were observed.

**Conclusions:** Fish oil in capsules improves compliance compared to a nutritional drink with an equivalent dose of n-3 LC PUFAs. Capsules, however, were not superior to the drink with respect to the effect on nutritional status or side effects. Our data did not suggest any effect of n-3 LC PUFAs on leukocyte and platelet counts during chemotherapy.

**References: Acknowledgements:** Smartfish is acknowledged for supplementing Nutrifriend Cachexia<sup>®</sup> and Orkla care Denmark for capsules Möllers Omega 3 Ekstra Sterk<sup>®</sup>.

**Disclosure of Interest:** None declared.

**MON-PO387****HIGH PREVALENCE OF MALNUTRITION AND NUTRITION IMPACT SYMPTOMS IN OLDER PATIENTS WITH CANCER: RESULTS OF A BRAZILIAN MULTICENTER STUDY**

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**Rationale:** Prevalence of malnutrition in hospitalized cancer patients is high. It is unclear whether in Brazil prevalence of malnutrition and nutrition impact symptoms is higher in older patients with cancer. In this study, we aimed to assess prevalence of malnutrition across different age groups in Brazilian hospitalized patients with cancer, and to identify associations with nutrition impact symptoms.

**Methods:** From August to November 2012, 4,783 patients with cancer aged  $\geq 20$  years and admitted to 45 public hospitals in Brazil were included in this observational, cross-sectional, multicenter study.

The Patient-Generated Subjective Global Assessment was used to evaluate presence of nutrition impact symptoms and to categorize patients according to nutritional status: Stage A = Well nourished, Stage B = Moderate/suspected malnutrition, Stage C = Severely malnourished.

**Results:** Of all participants, 26% were  $\geq 65$  years. Prevalence of moderate/suspected malnutrition was 45.3% and severe malnutrition 11.8%. In participants aged  $\geq 65$  years, the prevalence of moderate/suspected and severe malnutrition was 55% in total, while 36% in participants aged  $\leq 50$  years, and 45% in those aged 51–64 years. Nutrition impact symptoms more frequently present in participants aged  $\geq 65$  years (compared to those aged  $\leq 50$  years) were: no appetite (OR 1.90, 95% CI: 1.62–2.22,  $p < 0.05$ ) and dry mouth (OR 1.40, 95% CI: 1.18–1.67  $p < 0.05$ ). Nutrition impact symptoms more frequently present in participants aged 51–64 years were: no appetite (OR 1.45, 95% CI 1.23–1.69  $p < 0.05$ ), dry mouth (OR 1.22 95% CI, 1.02–1.45  $p < 0.05$ ).

**Conclusions:** The prevalence of malnutrition and nutrition impact symptoms is high in older ( $\geq 65$  years) Brazilian hospitalized cancer patients. The population aged over 50 years, chances of having at least one nutrition impact symptom no appetite and dry mouth are higher. Nutritional screening and assessment should be performed immediately after hospitalization, in order to enable early diagnosis and multidisciplinary intervention.

**Disclosure of Interest:** None declared.

**MON-PO389****THE EFFECT OF NUTRITIONAL STATUS ON THE DISEASE PROGRESSION IN PAEDIATRIC PATIENTS WITH SOLID TUMOURS**

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**Rationale:** Cancer is a leading cause of death for children, however, appropriate nutritional status can positively affect the outcome of the disease. The aim of this study was to determine whether intensified

nutrition support had an effect on the disease progression in paediatric patients with solid tumours.

**Methods:** Data of 148 patients with solid tumour, undergoing chemotherapy and treated at Semmelweis University 2<sup>nd</sup> Department of Paediatrics, was collected and analysed. The characteristics and treatment scheme of the underlying disease were identical. Two 3-year periods (2009–2011 and 2012–2014) were compared regarding several factors, including total time elapsed from diagnosis to completion of treatment, length of hospital stay, nutritional risk at diagnosis, number of patients receiving nutrition therapy, length of nutrition therapy and 2-year survival following the end of treatment. In 2012 the nutritional team was established and our own screening tool was used since no specialised tool for childhood cancer had been available then. BMI, weight-for-height, height-for-age and weight-for-age were interpreted using the Z-score classification system. For statistical analysis logistic regression, Fischer test and general linear model were used.

**Results:** Detected differences between the two groups (Group 1 without and Group 2 with intensified nutrition therapy): the number of patients at risk of malnutrition at diagnosis ( $n=6$  vs.  $n=47$ ;  $p < 0,005$ ) and the number of nutrition therapy days (22 vs. 54 days) have increased. Mortality rate decreased (from 58.5% to 23.5%) and the survival rate improved significantly during the second period (2012–2014: 54 patients (75%); 2009–2011: 44 patients (60%) survived ( $p < 0,005$ )). In addition, due to intensified nutrition support the time elapsed from diagnosis to the completion of treatment also reduced remarkably ( $512 \pm 39$  days; previously  $788 \pm 57$  days ( $p < 0,001$ )) in the first period.

**Conclusions:** Our data suggests that survival was better in the second period. The recognized nutritional risk, early nutrition therapy and regular monitoring seem to have positive effects on patient survival and the outcome of the disease.

**Disclosure of Interest:** None declared.

**MON-PO390****HOME ENTERAL NUTRITION IN CANCER PATIENTS WITH JEJUNAL ACCESS.**

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**Rationale:** Jejunal feeding is a treatment of choice for patients requiring artificial nutrition, not feasible for gastric or oral route, which is common in patients with upper gastrointestinal tract cancers and history of surgical treatment in this region. It is said to be less tolerated and connected with higher number of complications when compared to gastrostomy, however literature data are limited and often conflicting. The aim of this study was to assess the safety and tolerance of jejunal feeding in cancer patients requiring home enteral nutrition.

**Methods:** All consecutive patients qualified for home enteral nutrition at a single center in Gdańsk, Poland were later followed up by the same surgical oncological team until exclusion or death. Follow up visits were performed every 3 months, or earlier if needed or problems occurred. Patients' demographic and nutritional measures were assessed on initiation of treatment. Body weight and BMI, tolerance of enteral feeding and compliance, as well as complications' occurrence were recorded on follow up visits.

**Results:** A total of 65 patients, 47 men (72.3%), comprising 11480 patient-days of enteral nutrition were included in the study. Most patients ( $n=50$ , 76.9%) suffered from esophageal and gastric cancer, with initial body weight loss of 19% and palliative intent in 87.6%. The mean time of home nutrition was 177 days (min 8, max 594). Response to the treatment was good, with 90% tolerance after 3 months and 89%



compliance, however mean weight change at the end of treatment was –2.4 kg. Complications were noted  $n=18$  times and were mainly connected with the jejunal catheter (72.2%). Side effects were recorded  $n=16$  times.

**Conclusions:** Observations of our group prove, that jejunal feeding can be safe and effective way of home enteral nutrition for cancer patients, which stays in conflict with some literature results. Therefore, we see the need for further multicenter studies on larger groups of patients.

**Disclosure of Interest:** None declared.

#### MON-PO391

##### IDENTIFICATION AND IMPACT OF SARCOPENIA IN OVERWEIGHT AND OBESE PATIENTS WITH LOCALIZED RENAL CELL CARCINOMA

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**Rationale:** Sarcopenia is known in patient with normal weight and localized renal cell cancer (RCC). It has been shown that sarcopenic obesity may have a negative prognostic role in the management of cancer. We investigated sarcopenia at the initial diagnosis only in patients with excess of body weight.

**Methods:** Patients with overweight (25 BMI 29.9 kg/m<sup>2</sup>) or obesity (BMI  $\geq 30$  kg/m<sup>2</sup>) and localized RCC were retrospectively included. The total skeletal muscle and fat tissue areas were evaluated by CT-scan, used for disease staging. Patients were assigned to either a sarcopenia or non-sarcopenia group based on their skeletal muscle index (SMI) (cut-off 41.0 cm<sup>2</sup>/m<sup>2</sup> in females, 53.0 cm<sup>2</sup>/m<sup>2</sup> in males). Skeletal Muscle Density (SMD) was also studied. The association of these parameters and prognosis were analyzed.

**Results:** Among 100 patients included 46% were obese and 42% were sarcopenic before any treatment. Median follow-up was 24.9 months. Patients with sarcopenia were in more often men, with overweight and were older than the other patients ( $p < 0.05$ ). SMI had no impact on morbidity (infections, length of hospital stay), on overall survival (OS) or progression free survival (PFS). In the overweight group, low SMD (31 Hounsfield Units) had a negative effect on OS (42.6 months vs 111.3 months, HR = 4.3, 95% CI [1.01–18.0],  $p = 0.03$ ).

**Conclusions:** Sarcopenia exists and is not insignificant in patients with excess of body weight and localized-RCC. Low SMD has a negative impact on the OS of patients who are overweight. Their assessments, quick and simple, can be done on baseline CT-scan and broader evaluation of the findings may improve therapeutic care.

**Disclosure of Interest:** None declared.

#### MON-PO392

##### THE CONTRIBUTORY ROLE OF PROTEIN INTAKE ON MAINTAINING MUSCLE MASS IN PATIENTS WITH NON-SMALL CELL LUNG CANCER

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**Rationale:** Muscle wasting in cancer patients is prevalent and the role of protein intake in muscle maintenance remains unknown. The aim of the current study was to explore protein intake in relation to muscle

mass during anti-neoplastic treatment in patients with non-small cell lung cancer (NSCLC).

**Methods:** A longitudinal observation study was conducted in 52 NSCLC patients during the first three cycles of anti-neoplastic treatment. Nutrient intake was assessed by a 24-hour recall at the 1<sup>st</sup> and 2<sup>nd</sup> cycle of treatment. Absolute changes in muscle mass were calculated by routine thoraco-abdominal CT scans (baseline and after 3 cycles of treatment) at landmark lumbar 3<sup>rd</sup> vertebra (VikingSlice software). Independent t-tests and chi-square test were conducted to assess differences in protein intake in muscle maintainers ( $\pm 5.9$  cm<sup>2</sup>) and muscle wasters ( $> 6$  cm<sup>2</sup> loss). Univariate and multivariate linear regression analyses were performed.

**Results:** Most patients had stage IV disease and received palliative anti-neoplastic treatment. Twenty-seven out of 52 patients maintained muscle mass and had a significantly higher total protein intake (1.2 vs. 1.0 g protein/kg body weight/d,  $p = 0.023$ ) as well as a higher protein intake per meal (1.1 vs. 0.7 g protein/kg body weight/meal,  $p = 0.038$ ) compared to muscle wasters ( $n = 25$ ). The protein intake explained 9.2% of the variation in muscle mass which increased to 14.4% when the inflammatory score was added in the model ( $p < 0.05$ ).

**Conclusions:** Total protein intake and protein quantity per meal was higher in muscle maintainers compared to muscle wasters. Muscle wasting occurred frequently and early in the treatment trajectory. Muscle wasting should be diagnosed and effective interventions need to be identified.

**Disclosure of Interest:** None declared.

#### MON-PO393

##### CLINICAL EFFECTS OF CURRENT PARENTERAL NUTRITION TREATMENT IN PATIENTS WITH ADVANCED CANCER, A SYSTEMATIC REVIEW

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**Rationale:** The aim of this review was to evaluate the effects of current parenteral nutrition (PN) treatment on health-related quality of life (HRQoL), physical function, nutritional status, survival, tolerance to antineoplastic treatment and adverse events exclusively in patients with advanced cancer.

**Methods:** This review was conducted according to the PRIMSA guidelines (PROSPERO ID: 4201707915).

**Results:** Two underpowered randomized controlled trials and six observational studies were retrieved ( $n = 894$ ). HRQoL and physical function improved during anti-neoplastic treatment in patients unable to feed enterally (+4 to +24 score in overall QoL and +4 to +17 points in physical function, EORTC QLQ-C30,  $p < 0.05$ ); however, in patients able to feed per os PN was not superior to dietary counselling. Nutritional status improved in patients regardless of anti-neoplastic treatment and gastrointestinal function ( $\Delta 6.4$  kg fat free mass,  $p < 0.05$ ; +1.5 to +4.6 kg body weight,  $p < 0.05$ ). PN treatment was neither superior to fluid in terminal patients nor to dietary counselling in patients able to feed enterally in regards to survival. The total incidence of adverse events was low (3.6–9.0%; 0.33 per 1000 catheter days); however, a lack of systematic reporting was observed.

**Conclusions:** Current PN treatment in patients with advanced cancer is understudied and the evidence of the existing studies is weak. Further RCTs with sufficient number of patients of clinically homogenous subgroups are urgently needed.

**Disclosure of Interest:** None declared.

**MON-PO394****DEVELOPMENT OF A PROTOCOL FOR INSERTION OF NASOGASTRIC TUBES IN AN OUTPATIENT SETTING FOR PATIENTS UNDERGOING CHEMO ± RADIOTHERAPY TREATMENT FOR HEAD AND NECK CANCER IN A TERTIARY CARE CENTRE: A DIETETIC LED CLINIC AND PROTOCOL**

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**Rationale:** A protocol was developed for the insertion of naso gastric tubes (NGTs) in an outpatient setting for patients with head and neck cancer undergoing radiotherapy, ± chemotherapy. The aim of this protocol was to reduce hospital admissions, increase patient safety, prevent malnutrition and as a response to the increasing number of patients requiring hospital admission for 'reactively' placed NGT's within this patient group.

**Methods:** Dietetic input into this patient group was increased from 0.4 wte to 1.0 wte. If patients required a NGT after dietetic assessment an outpatient appointment was arranged with a nutrition nurse/qualified dietitian, for insertion of a NGT.

The dietitian underwent training to insert NGT's and completed competencies to be able to insert and train patients on NGT education. The patient was educated on how to use the NGT and necessary equipment themselves. The patient was provided with a NGT care plan booklet containing trouble shooting advice, pH on placement and measurement of the NGT at the nose. Position of the tube was checked using a pH of less than 5. A chest x-ray was not required unless the pH > 5.

Dietitians provided trouble shooting advice for patients at their outpatient appointment or over the phone.

Data was collected over a year on the number of patients who had a NGT inserted as an outpatient, compared with the number of patients who were admitted to hospital for NGT placement the year before. Length of hospital stay for patients admitted for NGT's was taken into consideration.

**Results:** This protocol prevented 24 hospital admissions and saved 168 bed days producing a cost saving of £30 912.

There was a 14.8% reduction in weight loss from a mean 8.1 kg–6.9 kg. The number of x-rays required to check the placement of the NGT were significantly reduced.

**Conclusions:** A dietetic led protocol provides a safe and effective way to insert NGT's in an outpatient setting, prevents hospital admissions and provides a cost saving to the NHS. There are plans to expand this to other service users.

**Disclosure of Interest:** None declared.

**MON-PO395****NUTRITIONAL CHANGES IN BORDERLINE RESECTABLE PANCREATIC CANCER PATIENTS ALONG THE ONCOLOGICAL TREATMENT**

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**Rationale:** Pancreatic ductal adenocarcinoma (PDAC) is a major cause of death, with a high rate of malnutrition at diagnosis. Neoadjuvant treatment (NAT) in borderline resectable (BR) PDAC is used to improve

resectability and outcomes, but just few patients could benefit due to toxicity or disease progression. The aim of our study is to assess pretreatment nutritional status and the changes that occur during NAT for BR PDAC.

**Methods:** From 2010 to 2018 all consecutive BR PDAC patients from our institution were included. All patients had an active nutritional support along the NAT. Demographic, oncological, surgical and nutritional parameters (body mass index (BMI), % weight (wt), serum albumin level, exocrine pancreatic insufficiency (EPI), nutritional assessment (PG-SGA) and nutritional intervention) were recorded at baseline and during the treatment.

**Results:** 81 BR PDAC patients (pts). **Baseline data:** mean age: 67 y (42–84), 64% men. Mean BMI: 24.8 kg/m<sup>2</sup>. EPI: 42% of pts. 93% pts had moderate or severe malnutrition (B or C), 52% of them with ≥10% wt loss for the last 6 m. Serum albumin was at normal ranges in all patients. 71% pts required oral nutrition supplementation. **During NAT,** 79% of pts needed to reduce dose of NAT due to toxicity. 46% of pts had their weight stabilized and 12% of them improved their nutritional status along de treatment. **After NAT,** surgery was performed in 44% of pts. Patients with weight loss and with severe malnutrition (C) during NAT were less operated (p = 0.05 and p = 0.044, respectively). Those patients without wt loss and/or with 'A' nutritional status after NAT had better overall survival (OR 3.03 p = 0.036) and progression free survival (OR 3.17 p = 0.0006).

**Conclusions:** A high prevalence of malnutrition and exocrine pancreatic insufficiency was observe at baseline and along the treatment in borderline resectable pancreatic ductal adenocarcinoma patients. Persistence of severe malnutrition and weight loss during neoadjuvant treatment despite nutritional intervention has a negative impact on clinical outcomes.

**Disclosure of Interest:** None declared.

**MON-PO396****BODY WEIGHT CHANGES AND HEPATOBILIARY EFFECTS ASSOCIATED WITH PARENTERAL NUTRITION IN PATIENTS WITH ACUTE MYELOID LEUKEMIA DURING REMISSION INDUCTION TREATMENT**

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**Rationale:** Malnutrition is an independent risk factor for adverse outcomes in patients with acute myeloid leukemia (AML) and parenteral nutrition (PN) is often used to prevent deterioration of nutritional status. This study investigated the influence of PN versus no or minimal intervention with PN on body weight changes and serum liver test levels in AML patients during intensive remission induction (RI) chemotherapy.

**Methods:** AML patients who underwent at least one RI chemotherapy cycle in one of three Dutch hospitals between 2004 and 2015 were included. Data on age, sex, chemotherapy regimen, dietary interventions, complications, and length of hospital stay were retrieved from medical records and from the Netherlands Cancer Registry. Body weight and serum concentrations of total bilirubin (TBILI) and liver enzymes (ALAT, ASAT, AP and GGT), expressed as 'times upper limit of normal' (xULN), were registered weekly between start of RI cycles and discharge. Body weight changes (%) were compared between patients treated in one of two hospitals where PN is frequently administered

(PN hospitals) and patients treated in the hospital where PN is only used in exceptional cases (no-PN hospital) using a repeated-measures mixed model analysis. Differences in severity of serum liver test elevations, according to the Common Terminology Criteria for Adverse Events (CTCAE) version 4.0, were assessed in patients who received PN (PN group) versus those who did not receive PN (no-PN group) using logistic regression analysis.

**Results:** In total 213 AML patients (no-PN hospital n = 111; PN hospitals n = 102), 46% female, with a mean ( $\pm$  SD) age of  $57.4 \pm 13.2$  years were included. Patients of the no-PN hospital experienced more body weight loss during RI treatment than patients of the PN hospitals (between-group difference 7.7%, 95% CI: 4.1–11.2%). Among patients who received only one RI cycle (n = 85), severe body weight loss of >10% occurred in 7% of patients of the PN hospitals versus 39% of patients of the no-PN hospital ( $P = 0.006$ ). For patients receiving two RI cycles (n = 128) this was 17% versus 70%, respectively ( $P < 0.0001$ ). Explorative analysis among the total study population with multivariate linear regression models showed body weight loss to be significantly associated with longer duration of hospitalization. Median serum concentrations of TBIL remained below the ULN in both the PN- and no-PN group. However, PN was associated with transient mild elevations of serum ALAT-, ASAT- and AP levels (median values  $\leq 2.0 \times$  ULN), with moderately elevated GGT levels (median values  $\leq 4.0 \times$  ULN), and with higher odds for CTCAE-grade 3–4 GGT levels during the first RI cycle (OR: 3.4, 95% CI: 1.3–8.5).

**Conclusions:** Compared to no or minimal intervention with PN, the nutrition support strategy, including frequent administration of PN, better preserved body weight in AML patients during intensive RI chemotherapy without severe adverse hepatobiliary effects of PN.

**Disclosure of Interest:** None declared.

#### MON-PO397

##### PARENTERAL NUTRITION THERAPY IN PATIENTS WITH INCURABLE CANCER: A RETROSPECTIVE MEDICAL CHART REVIEW OF CURRENT PRACTICE

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**Rationale:** Indication for use, dose and duration of parenteral nutrition (PN) in patients with incurable cancer is understudied. The aim of the study was to describe current practice of PN treatment in adult

patients with incurable cancer at St. Olavs University Hospital, Trondheim, Norway.

**Methods:** A retrospective medical chart review of patients with incurable cancer receiving PN between 2011 and 2017 was conducted. Of 271 identified patients, data from the first 78 patients was included in this preliminary analysis. Medical information was collected from start of PN until patients' death.

**Results:** The mean (SD) age was 63.5 (12.9) years, 41 women and 37 men. All patients received PN concomitant with anti-cancer treatment at some point in time. The most common indications for PN were 'insufficient oral or enteral intake' (n = 67) or 'gastrointestinal malfunction' (n = 17). At start of PN, there were no differences between subgroups in s-albumin, C-reactive protein level, metastatic disease, or ascites. The main reason for discontinuation of PN was imminently dying patient (n = 36), patient preferences (n = 19), and complications (n = 12).

The table presents available data on PN treatment and survival in subgroups defined by duration of PN treatment. Data presented as number (n) or median (Q1–Q3).

**Conclusions:** To our knowledge, this is the first study describing clinical practice with respect to dose, duration and termination of PN in incurable cancer patients. Preliminary data suggest that the use of PN was dynamic and differentiated. Termination of PN was based on expected patient survival, patient preferences, and treatment complications.

**Disclosure of Interest:** None declared.

#### MON-PO398

##### EXAMINATION OF IMMUNE-NUTRITIONAL INDEX BEFORE AND AFTER SURGERY AND PROGNOSIS FOR COLON CANCER PATIENTS: POSSIBILITY TO NUTRITIONAL PRECISION MEDICINE

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**Rationale:** National Comprehensive Cancer Network (NCCN) guideline for colon cancer indicated that adjuvant chemotherapy is not recommended for Stage II and is recommended for Stage III for half an year. In other words, it is possible that chemotherapy is not available for Stage II patients who require it and chemotherapy is performed for Stage III patients who don't require it. In addition, it has been reported that neutrophil lymphocyte ratio (NLR) are useful as prognostic factors in various cancer types including colon cancer. We examined the relationship between immune-nutritional indexes before and after surgery and the outcome of colon cancer patients in our hospital.

**Methods:** We retrospectively analyzed 119 patients of Stage II and III colon cancer who underwent curative surgery in our institution

**Table** (abstract: MON-PO397).

	Variables	<2 weeks	2 weeks -1 month	1 month - 2 months	>2 months	P <sup>1</sup>	n
PN treatment	Patients (n)	14	20	16	16		66
	Highest received PN dose, kcal	1100 (612–1600)#,□	1600 (1100–2200)#	1600 (1100–1600)	1750 (1450–2200)□	0.001	62
	Received dose (percentage of estimated energy need)	73 (43–73)	78 (62–101)	69 (50–94)	97 (73–118)	0.03	52
	Documented oral food intake, n	9	16	15	15	0.09	55
Survival	From start of PN, days	19 (13–74)&	39 (26–384)	61 (43–115)	168 (88–295)&	0.001	66
	From PN termination, days	10 (4–70)	16 (5–358)§	4.5 (1–70)	2 (1–7)§	0.016	66

<sup>1</sup>Kruskal-Wallis test, Dunn's Post Hoc test; #  $P = 0.04$ , □  $p = 0.003$ , &  $P = 0.001$ , §  $P = 0.02$ ; n indicates number.



between 2007 and 2013 (II:68, III:51). NLR and PLR were calculated from the numbers of neutrophils and lymphocytes of peripheral blood before surgery and in the postoperative stable period. As the Cut-off value, a value calculated using ROC curve (NLR: 2.0) and values based on literature (NLR: 4.0) were used.  $\Delta$ NLR as the change rate (preoperative NLR value/postoperative NLR value) was calculated. And Then, we analyzed statistically the relationship these immune-nutritional indexes, overall survival (OS) as prognosis, and clinicopathological findings.

**Results:** The median of preoperative NLR was 2.706 (2.068–3.810). Assuming the cut-off value of NLR was 4.0, 92 cases in the low NLR group and 27 cases in the high NLR group were obtained (no differences in clinicopathological background), and the 5-year OS showed significant difference in survival rate at 85.0/64.7% in the low preoperative NLR/high preoperative NLR group respectively ( $p = 0.0004$ ). The median value of  $\Delta$ NLR was 1.306 (1.040–1851), and 90 patients (76.9%) had lower postoperative NLR than before surgery. Assuming the cut-off value of NLR was 1.287 calculated from the ROC curve, 56 cases in the low  $\Delta$ NLR group and 61 cases in the high  $\Delta$ NLR group, and the 5-year OS showed a significant difference in survival rate at 74.6/87.5% ( $p = 0.0374$ ). In univariate analysis, gender, T factor, preoperative NLR, and  $\Delta$ NLR showed dominant differences between OS and clinicopathological factors ( $P < 0.05$ ). In multivariate analysis, preoperative NLR and T factor became independent factors. Moreover, low  $\Delta$ NLR patients showed poor survival in high preoperative NLR group.

**Conclusions:** It is suggested the higher the rate of decrease in NLR, the better the prognosis in malnutrition patient. And it may be useful for Nutritional precise medicine.

**Disclosure of Interest:** None declared.

#### MON-PO399

##### NUTRITIONAL CARE PATHWAYS OF PATIENTS WITH MALIGNANT BOWEL OBSTRUCTION: PRELIMINARY FINDINGS FROM 8 UK CENTRES

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**Rationale:** Variations in access to parenteral nutrition (PN) in advanced cancer patients with malignant bowel obstruction (MBO) and intestinal failure exist due to differing practice, beliefs and resource access. We aimed to examine nutritional care pathways of MBO patients at 8 UK Tertiary-Referral Centres.

**Methods:** A retrospective cohort study of MBO adults admitted to hospitals between 1.1.16–31.12.16 and any readmissions up to 31.12.17. Demographic, nutritional and medical data were analysed by comparing patients referred (R) or not referred (NR) for PN. Differences between groups tested by Kruskal-Wallis and Chi-Squared tests and survival by Kaplan Meier Curves and Cox regression.

**Results:** 197 patients with 371 MBO admissions (median 66 yr, range 32–97 yrs, 30% male), with 2 admissions/patient (1–8) were identified. 56/197 patients were referred (R group). Gynaecological and gastrointestinal cancers predominated (72%). 79% of patients had

metastases. 66% of admissions presented with subacute BO, 60% with single-, 35% with multi-level BO in either complete (45%) or partial BO (55%).

Admission malnutrition screening, MDT PN discussion and dietetic contact were more likely to occur in the R group-103/371 admissions (R vs. NR group: 96% vs. 84%,  $P < 0.01$ ; 54% vs. 1%,  $P < 0.0001$ ; 27% vs 17%,  $P < 0.0001$ ). Median admission weight loss was 5.9% (–45% to 26.2%). No difference was observed in weight or BMI at start of PN (R vs. NR: 56 vs. 58 kg, BMI 21.2 vs. 21.7 kg/m<sup>2</sup>) or weight at follow-up (0–3 months) (R vs. NR 54 vs. 57 kg). 44/103 R group admissions received inpatient PN only, with 47 patients discharged or already established on HPN.

Survival was 158 days (131–271) with no difference between PN groups.

**Conclusions:** Nutritional screening and knowledge of potential palliative HPN appear to significantly influence referral and outcomes, but further comparison of disease severity and other prognostic markers between groups would be required to determine this.

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#### MON-PO400

##### PARENTERAL NUTRITION IN PATIENTS WITH MALIGNANT BOWEL OBSTRUCTION: PRELIMINARY FINDINGS FROM 8 UK CENTRES: ARE ALL PATIENTS REFERRED APPROPRIATELY?

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**Rationale:** There is variation in access to parenteral nutrition (PN) in patients with malignant bowel obstruction (MBO) and intestinal failure. We aimed to examine outcomes of patients with MBO, across 8 UK tertiary centres, who were not referred to the nutrition team that may have required PN.

**Methods:** A retrospective cohort study of adults with MBO, admitted to hospitals between 1.1.16–31.12.16 and any readmissions up to 31.12.17. Demographic, nutritional and medical data were analysed by comparing patients who were not referred to the nutrition team ( $n = 141$ ) and who we speculate may have required PN (RPN) (based on patients initial admission presenting with complete BO that was not resolved on discharge from hospital) versus those discharged on HPN. Differences between groups tested by Kruskal-Wallis and Chi-Squared tests and survival by Kaplan Meier Curves and Cox regression.

**Results:** 141/197 patients were not referred to nutrition team (median age: 67 yrs, range: 32–97, 72% female). Gynaecological and

gastrointestinal cancers predominated (78%) and 82% presenting with metastases, mostly subdiaphragmatically.

RPN (n = 18/141) vs HPN (n = 47) group were more likely to be conservatively managed (100 vs 66%,  $P < 0.01$ ), higher BMI (24.8 vs 21.7 kg/m<sup>2</sup>,  $P = 0.01$  but with higher weight loss (−20 vs. −6%,  $P = 0.02$ ), shorter median survival (34 vs 317 days,  $P < 0.0001$ ), higher CRP (105 vs 26 mg/L,  $P = 0.01$ ) and less likely to have dietetic input (33 vs 89%,  $P < 0.0001$ ), length of stay (8 vs 26 days,  $P = 0.003$ ), and no. of readmissions (1 vs 3,  $P < 0.01$ ).

**Conclusions:** Within the limitations of the study, our findings suggest that some patients may be missed for the initiation of PN. The HPN group had a longer survival and lower weight loss (which is a function of QoL), though it is associated with longer stay in hospital and readmissions.

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#### MON-PO401

##### NUTRITIONAL CARE PATHWAYS OF PATIENTS WITH MALIGNANT BOWEL OBSTRUCTION: EXPERIENCE FROM A UK TERTIARY-REFERRAL CENTRE

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**Rationale:** Emerging evidence is gathering for the use of parenteral nutrition (PN) in patients with malignant bowel obstruction (MBO) who have lost nutritional autonomy and developed Intestinal Failure (IF). However, there is limited evidence describing the outcomes for MBO patients who are not referred for PN. We aimed to examine nutritional care pathways of MBO patients by referral for PN and appropriateness of referral/non-referral for PN.

**Methods:** Retrospective cohort study of adults ( $\geq 18$  yrs) admitted to University College London Hospital, admitted with MBO between 1.1.16–31.12.16 with any readmissions up to 31.12.17. Data were analysed by comparing patients who were referred (R) and not referred (NR) for PN.

**Results:** We identified 72 patients with 117 MBO admissions (mean  $\pm$ SD age: 63.1  $\pm$  13.1 yrs, 79% female), with median no. of admissions/patient as 1 (range: 1–6). 24/72 patients were in R group. Predominant primary malignancies were gynaecological and gastrointestinal cancers (76%). 83% of MBO patients had metastases and 61% were located subdiaphragmatically. All patients were at high risk of malnutrition using UCLH nutrition screening tool (score of 8, a score of  $\geq 7$  indicates high risk of malnutrition) and mean weight loss on admission was 7%. Discussion of PN at MDT (21% vs. 4%,  $P = 0.02$ ) and dietetic contact (94% vs 41%,  $P < 0.0001$ ) were more likely to occur in the R group. In 13/69 MBO admissions in NR group, the reasons for non-referral to the Nutrition team are unclear. Conservative management of cancer was more likely to occur in NR group (94% vs. 77%). Chemotherapy and surgery for BO were more likely to occur in the R group. There was no significant difference in modified Glasgow Prognostic Score in the 2 groups. 20/24 referred patients received inpatient PN (4 did not start: 1 declined, 3 were advised to optimise

enteral nutrition following assessment), and 10 patients went home with PN. The remaining patients did not go home on PN as BO resolved or they were approaching the end of life. There were no differences in weight or BMI by PN referral groups. In all patients, median weight on admission was 55 kg (range: 38–100 kg), and 55–55.8 kg at 0-3- and 3-6- months follow-up. Overall survival was 4.7 (1.4–15.2) months, with no differences by referral groups

**Conclusions:** All patients with MBO presented with high risk of malnutrition on admission. Less than half were referred to the Nutrition team. Interestingly, patients who received a dietetic review and when PN was discussed at MDT were more likely to be referred for PN. It was unclear in some cases why patients were not referred for PN. Timing of referral and integration of nutritional care, not only PN, into clinical management discussion at MDT is crucial. Not all patients referred to the Nutrition team were discharged on HPN based on judicious review of each case.

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#### MON-PO402

##### SYSTEMIC ANTI-CANCER THERAPIES IMPAIR THE NUTRITIONAL STATUS OF NEUROENDOCRINE TUMOR PATIENTS – A PILOT STUDY

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**Rationale:** Neuroendocrine tumors (NETs) are rare tumors and treatment plans comprise various treatment options. In NET-patients, malnutrition is a clinically relevant problem independently influencing overall survival, particularly in patients undergoing chemotherapy (CTx).<sup>1</sup> So far, therapy-related influence on comprehensive nutritional status has not been studied prospectively.

**Methods:** Comprehensive nutritional assessment was performed, including Subjective Global Assessment (SGA), anthropometry parameters, indirect calorimetry, bioelectrical impedance analysis and food diary before and during therapy.

**Results:** Twenty-six NET patients were analyzed (CTx n = 6, targeted therapies (tTx) n = 7, biotherapeutics n = 13). At baseline, 9/24 patients were hypermetabolic and according to SGA, 9/25 patients were moderately or severely malnourished (SGA-B: 6, SGA-C: 3), although BMI was within or above the normal range in almost all patients (BMI  $\geq 18.5$ : n = 25 pts, BMI  $< 18.5$ : n = 1). Survival analysis showed reduced survival in those graded SGA B+C at baseline (n = 25;  $p = 0.003$ ). After 38  $\pm$  7 weeks of treatment (n = 14), bodyweight and BMI were significantly reduced (−3 kg,  $p = 0.021$  and −1 kg/m<sup>2</sup>,  $p = 0.028$ ; resp.), appetite was decreased ( $p = 0.035$ ) and SGA worsened in 5 patients. Subgroup analysis of patients on tTx (i.e. everolimus, n = 5) showed a significant increase in energy expenditure (REE) per metabolically active body cell mass (60.3 vs. 68.6 kcal/kg BCM;  $p = 0.022$ ), a trend towards body weight reduction (−5.7 kg, n = 5,  $p = 0.068$ ) despite at least constant oral intake (2818 vs. 3017 kcal;  $p = 0.336$ ) and 2 of 5 patients became hypermetabolic.

**Conclusions:** Anti-cancer therapies bear the risk of worsening nutritional status (i.e. by increasing REE) in NET G1/G2 patients who are already prone to malnutrition. Close nutritional monitoring – beyond BMI examination – is advised.

#### Reference

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#### MON-PO403

##### PREVALENCE OF SARCOPENIA IN OLD PATIENTS WITH A GASTRO-INTESTINAL CANCER TREATED WITH ADJUVANT CHEMOTHERAPY

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**Rationale:** Loss of muscle mass is associated with poor survival and loss of autonomy in gastro-intestinal cancers and might be influenced by age, cancer treatment, nutritional status and presence of cachexia. We aimed to assess the evolution of sarcopenia according to EWGSOP criteria 2010 and 2018 in old patients with a gastro-intestinal cancer treated with adjuvant chemotherapy.

**Methods:** 50 patients aged 65+ with treatment-naïve gastro-intestinal cancers were included. Muscle mass was assessed by L3-centered CT scan, muscle strength by handgrip dynamometer and physical performance by a 4-meter walking test. Sarcopenia was defined according to EWGSOP criteria 2010 and 2018, frailty status according to Fried criteria, nutritional status according to MNA-sf and cachexia stages according to Vignano criteria. We analyzed data at baseline, and after 6 months and 12 months. We also analyzed 1 year-mortality rate and baseline factors associated with mortality.

**Results:** At 0, 6 and 12 months, the prevalence of sarcopenia according to EWGSOP-2010 was respectively 28%, 36% and 39%, and according to EWGSOP-2018 was 8%, 19% and 32%. 1 year-mortality rate was 15(29%). The only factor associated with mortality in multiple regression was cachexia (OR 2.84 (CI95% 1.30–6.18 – p=0.009). Age, cancer stage, sarcopenia, frailty status, and nutritional status were not associated with mortality in multiple regression.

**Conclusions:** The prevalence of sarcopenia in old digestive cancer patients treated with adjuvant chemotherapy rises with time according to both EWGSOP definitions. Cachexia is the only prognostic factor of mortality. Further studies are needed to assess if adequate physical activity and nutritional counseling before initiation of treatment could improve outcomes of these patients.

**Disclosure of Interest:** None declared.

#### MON-PO404

##### L-GLUTAMINE DOES NOT INFLUENCE THE SURVIVAL OUTCOMES IN PATIENTS WITH LOCALLY ADVANCED HEAD AND NECK CANCER RECEIVING CHEMORADIOTHERAPY

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**Rationale:** We have reported that L-glutamine decreases the severity of chemoradiotherapy (CRT)-induced mucositis in patients with head and neck cancer (HNC) in a double-blind, randomized, and placebo-controlled study. However, whether glutamine promotes tumor growth and interferes with anticancer effect of CRT remains controversial. The present study aimed to investigate whether L-glutamine negatively impacted survival outcomes in these patients.

**Methods:** Forty patients with squamous cell carcinoma of the nasopharynx, oropharynx, hypopharynx, or larynx were enrolled in the study. All patients received 66 or 70 Gy of total radiation at the rate of 2 Gy per fraction daily and five fractions per week. Cisplatin (20 mg/m<sup>2</sup>) and docetaxel (10 mg/m<sup>2</sup>) were intravenously co-administered once a week for 6 weeks. Patients were randomized to orally receive either glutamine (group G, n = 20) or placebo (group P, n = 20) at a dose of 10 g three times a day throughout the CRT course, and the severity of mucositis were compared between the 2 groups. After 10 weeks of treatment, tumor response was evaluated using PET-CT and histopathological examination of biopsy specimens. We compared the overall survival (OS) and the progression free survival (PFS) between the two groups. The follow-up time was 5 years. QOL was evaluated using the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30 ver.3.0) and QOL Module for Head and Neck Cancer (EORTC QLQ-H&N35 ver.3.0) for Japanese patients.

**Results:** After 10 weeks of CRT completion, the tumor responses in group G were as follows: complete response (CR) 65%, partial response (PR) 25%, stable disease (SD) 10%, and progressive disease (PD) 0%. Those in group P were as follows: CR 60%, PR 25%, SD 0%, PD 10%, and unknown 5%. No significant difference in the response rate after 10 weeks of CRT completion was observed between the groups (group G: 90%, group P: 85%; p = 0.390). Thirty patients (75%) were survived at the 5-year follow-up (16 in group G vs. 14 in group P). There was no significant difference in survival time between the groups (group G: 46.0 ± 2.3 months, group P: 31.8 ± 2.5 months; p = 0.434). Twenty-seven patients were free of disease progression (14 in group G vs. 13 in group P). There was no significant difference in progression free survival time between the groups (group G: 49.8 ± 4.4 months, group P: 14.3 ± 1.1 months; p = 0.620). There were no significant differences in those QOL scores between group G and group P.

**Conclusions:** L-glutamine did not influence the survival outcomes in patients with locally advanced head and neck cancer receiving CRT.

**Disclosure of Interest:** None declared.

#### MON-PO405

##### PROLONGING FACTORS OF THE DURATION OF PARENTERAL NUTRITION IN PATIENTS TREATED WITH HEMATOPOIETIC STEM CELL TRANSPLANTATION

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**Rationale:** Nutritional management is strongly required to improve the survival and QOL of the hematopoietic stem cell transplantation (HSCT) patients. Although several guidelines indicate the strategy of nutritional management of HSCT patients, we often encounter complicated cases of nutrition management in clinical settings. In this study, we investigated the relationship between patient factors and the duration of both total parenteral nutrition (TPN) and parenteral nutrition (PN).

**Methods:** Sixty-one patients who underwent HSCT in the Department of Hematology in Shiga University of Medical Science Hospital between April 2010 and December 2014 were enrolled. The



relationship between patient factors and the duration of TPN and PN were retrospectively analyzed based on the medical records. Multiple linear regression analyses were performed to identify confounding factors for the duration of TPN and PN.

**Results:** Forty-nine and 53 patients were received TPN and PN. The mean duration of in-hospital TPN and PN was  $20.1 \pm 22.2$  and  $26.1 \pm 23.2$  days, respectively. Administration route was replaced from oral intake to PN with decreasing oral intake. As protein intake derived from meal was insufficient, amino acid intake was significantly increased from injections. In multivariate analysis, body mass index (BMI) was significantly correlated with the duration of TPN ( $\beta = -2.733$ ;  $p < 0.05$ ) and PN ( $\beta = -2.260$ ;  $p < 0.05$ ). In addition, use of the myeloablative conditioning regimen, including busulfan and cyclophosphamide significantly prolonged the duration of PN, compared with the reduced-intensity conditioning regimen ( $\beta = 12.726$ ;  $p < 0.05$ ), generally including melphalan.

**Conclusions:** BMI at admission and the type of conditioning regimen may affect the duration of TPN and PN.

**Disclosure of Interest:** None declared.

#### MON-PO406

##### POSSIBILITY OF DIRECT EFFECT OF ELEMENTAL DIET ELEMENTAL<sup>®</sup> ON CHEMOTHERAPY-INDUCED ORAL MUCOSITIS AND DERMATITIS

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**Rationale:** Elental<sup>®</sup>, an elemental diet (ED) with L-Glutamine has been used in Japan as a treatment for malnourished patient. In addition, Elental<sup>®</sup> has been reported to be useful in the management of chemotherapy-induced mucositis in various cancer patients. Recently, we have also reported that Elental<sup>®</sup> effectively reduced chemotherapy-induced oral mucositis and dermatitis in oral squamous cell carcinoma (OSCC) patients. However, it is still unclear whether or not oral intake of ED can act directly on chemotherapy-induced oral mucositis and/or dermatitis. In the present study, we investigated the direct effect of ED on chemotherapy-induced oral mucositis in OSCC patients.

**Methods:** We evaluated the direct effect of ED on the healing process of 5-fluorouracil (5-FU)-induced dermatitis in nude mice by comparing topical application and oral administration by a gastric tube. Moreover, we examined the effect of ED on the proliferating ability, wound healing ability and migration ability by MTT assay, wound healing assay and migration assay respectively with immortalized human keratinocyte cell line; HaCaT after 5-FU pre-treatment.

**Results:** Oral administration with a gastric tube as well as topical application of ED reduced dermatitis more effectively than dextrin administration of the same caloric value in the animal model. MTT assay revealed the growth-promoting effect of ED on HaCaT after 5-FU pre-treatment. In addition, ED could enhance the wound healing ability and migration ability of HaCaT as observed by wound healing assay and migration assay respectively.

**Conclusions:** These findings suggest that topical application of ED is effective in the treatment of dermatitis, and oral intake of ED might act directly on chemotherapy-induced oral mucositis in patients with OSCC.

**Disclosure of Interest:** None declared.

#### MON-PO407

##### RELATIONSHIP BETWEEN NUTRITIONAL STATUS AND HANDGRIP STRENGTH IN THE ONCOLOGICAL PATIENT

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**Rationale:** Muscle protein depletion is a hallmark of cancer cachexia, severely impinging quality of life and physical function and treatment tolerance. The assessment of malnutrition is crucial for early nutritional interventions in these cases. The handgrip strength is a clinical method for assessing the muscle function and is indicated as a reliability the nutritional status. A cross-sectional study was conducted to evaluate the patient's nutritional status through the application of Patient-Generated Subjective Global Assessment PG-SGA<sup>®</sup>, with a handgrip strength.

**Methods:** The nutritional status of 30 patients with cancer diagnosed were assessed, using a Patient-Generated Subjective Global Assessment (PG-SGA<sup>®</sup>) and handgrip strength, with 3 maximal contractions of the left and right hands. The statistic relationship between PG-SGA<sup>®</sup> and handgrip strength, was performed using SPSS (Statistical Package for the Social Sciences) with Spearman Correlation.

**Results:** According to PG-SGA<sup>®</sup>, 16,7% (n=5) of the patients were moderately undernourished, and 10% (n=3) were severely undernourished. A significant association between nutritional status according to PG-SGA<sup>®</sup> and handgrip strength in the non-dominant hand ( $r = -0.423$ ;  $p = 0.022$ ) was gotten. On the other hand, in the dominant hand a negative result was found, however with non-significant association ( $r = -0.058$ ;  $p = 0.765$ ).

**Conclusions:** There appears to be an inversely proportional relationship between the nutritional status and the noun by the PG-SGA<sup>®</sup> and the handgrip strength percentile. Handgrip dynamometry can be a useful tool to evaluate the functional and nutritional status of the patients with cancer diagnosis.

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**Disclosure of Interest:** None declared.

#### MON-PO408

##### EFFECT OF NUTRITION STATUS ON PATIENT ACTIVITIES OF DAILY LIVING IN DIGESTIVE CANCER PATIENTS

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**Rationale:** The incidence rate of digestive cancer is high and cancer death have been increasing in Japan, based on the national survey of the incidence and mortality data in 2013. However, little is known about the relationship between nutrition status and activities of daily living (ADL) for digestive cancer patients after surgery. The purpose of this retrospective study is to investigate the relationship between nutrition status and ADL in digestive cancer patients.

**Methods:** Ninety-one digestive cancer patient treated with surgery, hospitalized from June 2016 to May 2017, were included. The nutrition status was evaluated based on modified controlling nutritional status

score: albumin (g/dL), total number of lymphocytes (/ $\mu$ l), and hemoglobin (g/dL).<sup>(1)</sup> Barthel index was used to measure the performance in ADL and was examined at the time of hospital discharge and admission. All patients were received rehabilitation during hospitalization. Pearson's correlation coefficient was applied.

**Results:** Correlation between modified CONUT score and Barthel index was detected ( $r = 0.73$ ,  $P < 0.05$ ). The higher modified CONUT score shows lower Barthel index score both at the time of hospital discharge and admission. The higher modified CONUT score was significantly associated with lower improvement of Barthel index score ( $r = 0.59$ ,  $P < 0.05$ ).

**Conclusions:** This study shows that nutrition status is strongly associated with ADL in digestive cancer patients. Patients with malnutrition showed the lower improvement of ADL despite of rehabilitation. Based on our findings, it might be preferable to improve patients' nutrition status before surgery.

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**Disclosure of Interest:** None declared.

#### MON-PO409

##### THE CLINICAL VARIABLES OF COMPLICATIONS IN GASTROINTESTINAL CANCER PATIENTS RECEIVING HOME PARENTERAL NUTRITION

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**Rationale:** Malnutrition or cachexia in the gastrointestinal (GI) cancer patients is a major problem due to advance cancer stage related or GI dysfunction. Home parenteral nutrition (HPN) is a nutrition-supportive therapy to fulfill the nutritional need for these patients who cannot acquire appropriate enteral nutrition. However, long-term use of HPN may also cause various complications from minor central catheter-related mechanical problems to major life-threatening issues such as electrolyte imbalance or catheter-related bloodstream infections (CRBSIs). The aim of this study is to determine the clinical variables of complications acquired from HPN therapy among the GI cancer patients in a single medical center.

**Methods:** This retrospective study was conducted with GI cancer patients who received HPN from April 2004–December 2018. A total of three-hundred and eighty-two patients was enrolled. Univariate analysis and Kaplan Meier survival curves was used for the statistical analysis

**Results:** There were 240 (62.8%) males and 142 (37.2%) females, with a mean age of  $62.16 \pm 13.37$  years. Of 382 patients, 240 (62.8%) patients had colorectal cancer and 142 (37.2%) patients had gastric cancer. Besides, 239 (62.6%) patients had stage IV disease. Median HPN administration period was 43.5 days (range, 4–728 days). The most frequent complication was hyperglycemia and followed by hyperbilirubinemia, electrolyte imbalance, CRBSIs, catheter occlusion, catheter slipping, hypoglycemia and catheter disconnection. When patients having HPN-related complications, they had longer duration of HPN ( $91.07 \pm 103.07$  days vs.  $42.29 \pm 49.29$  days,  $P < 0.001$ ). Besides there was higher proportion of diabetic patients in complicated patients (22.9% vs. 13.7%,  $P = 0.05$ ). The median OS of patients with serum C-reactive protein (CRP) level greater than 50 mg/L was shorter than those not (1 month; 95%CI, 0.343–1.657 vs. 2 months; 95%CI, 1.447–2.553; HR = 1.42; 95%CI, 1.039–1.946;  $P = 0.012$ ).

**Conclusions:** The most frequent complication among the GI cancer patients receiving HPN was hyperglycemia, of which hyperglycemia

occurred more frequently in patient may have a longer duration of HPN. We should pay more attention to diabetic patients receiving HPN therapy and patients having a serum CRP level greater than 50 mg/L.

**Disclosure of Interest:** None declared.

#### MON-PO410

##### OMEGA 3 SUPPLEMENTATION INCREASES SURVIVAL IN HEAD AND NECK CANCER PATIENTS

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**Rationale:** Head and neck cancer patients develop important nutritional alterations due to cancer-cachexia that affect survival. Omega-3 fatty acids, specifically EPA (eicosapentaenoic acid) has shown to be a nutritional an option to maintain nutritional status. Therefore, the research question was: ¿What is the effect of omega 3 fatty acids supplementation during treatment on 5-years survival in head and neck cancer

**Methods:** This is an observational prospective study with a 5-years follow up. We enrolled 64 patients who previously received either a polymeric diet enriched with omega-3 (EPA) Supportan Drink<sup>®</sup> (2 g per day) of a standard polymeric formula with equal amount of energy and protein, during their antineoplastic treatment. We followed up the patients for five years to determine mortality or time of survival. Differences between groups were analyzed with a chi-square test for qualitative variables and student-t test for numerical variables. Survival was calculated by Multivariate COX regression with Log rank test

**Results:** We included a total of 50 patients: 25 (50%) were male and 25 (50%) female. Average age of  $59.9 \pm 13.66$  years old. From the whole sample, 52% of them received the supplement containing 2 gr of EPA (Supportan Drink<sup>®</sup>) and 48% of them the standard supplement. Follow-up showed a mortality of 50% for the supplemented group (2 g of EPA per day) and 58% for the control group ( $p = 0.380$ ). Survival between groups showed non significant differences. However, the differences in survival time between group were 29 (experimental group) versus 23 (control group) months.

**Conclusions:** Supplementation with an omega 3 enriched formula during oncology treatment had no effect in mortality. However, there was a tendency in a longer survival time in the experimental group. Further analysis will be made after 10 years to find out what happened with a longer survival time.

**Disclosure of Interest:** None declared.

#### MON-PO411

##### PREVALENCE OF SARCOPENIC OBESITY AMONG MEXICAN NON METASTATIC BREAST CANCER PATIENTS

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**Rationale:** Breast cancer is the leading oncologic cause of incidence and mortality among women in the world. Due to the higher prevalence of obesity worldwide, combined with the muscular catabolism, sarcopenic obesity has increased among patients with cancer. The aim of this study is to evaluate the prevalence of sarcopenic obesity in mexican patients with non metastatic breast cancer.

**Methods:** We included non metastatic breast cancer patients diagnosed between 2014–2018. All patients were treated with (neo) adjuvant chemotherapy. Before treatment, we assessed the bioelectrical impedance analysis, height and weight. Obesity was defined as fat mass index (FMI) >11.8 kg/m<sup>2</sup> and sarcopenia was defined as fat-free mass index (FFMI) <15.1 kg/m<sup>2</sup>.

**Results:** 237 patients were included. Median age at diagnosis were 49 years old, 20.3% (48) of patients had sarcopenic obesity with no difference with their age (<50 years: 18 and >50 years: 30 patients). The median of FMI were 16.77 kg/m<sup>2</sup>. (4.74–42.32 kg/m<sup>2</sup>) and for FFMI 16.03 kg/m<sup>2</sup> (5.6–22.29 kg/m<sup>2</sup>).

**Conclusions:** To our knowledge this is the first study that evaluates the presence of sarcopenic obesity among Mexican, non metastatic breast cancer. The next step with this information and the growing cases of sarcopenic obesity has to be evaluate the role of this condition in the outcomes (survival and chemotherapy toxicity) for Mexican non metastatic breast cancer patients.

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**Disclosure of Interest:** None declared.

#### MON-PO412

#### PREOPERATIVE WEIGHT LOSS PREDICTS POSTOPERATIVE INFECTIOUS COMPLICATIONS IN ELDERLY PATIENTS WITH GASTRIC CANCER

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**Rationale:** To evaluate the postoperative complications and their risk factors in elderly patients with gastric cancer.

**Methods:** 331 patients (≥70 years) who underwent curative gastrectomy for gastric cancer were retrospectively analyzed. The infectious complications included pulmonary infection, urinary tract infection, pleural or abdominal effusion, wound complications and systemic inflammation response syndrome, but not infections due to anastomosis leakage. The severity of postoperative complications was clarified according to the Clavien-Dindo classification.

**Results:** Of all the patients, male accounted for the majority (252 cases, 76.1%) and age ranged from 70 to 88 (average 74.7) years old. Operative mortality was 1.2% (4 cases) and overall postoperative morbidity was 42.9% (142 cases). Clavien-Dindo class 3 and more was 38 cases (11.5%). There were 65 cases of infectious complications. Multivariable analysis revealed that preoperative weight loss ≥5% (hazard ratio 2.214, 95% confidence interval 1.145–4.279, p=0.018) and Charlson comorbidity score ≥4 (hazard ratio 2.834, 95% confidence interval 1.303–6.163, p=0.009) were independent risk factors for infectious complications.

**Conclusions:** The elderly patients with preoperative weight loss and many comorbidities have more risk of postoperative infectious complications. So fully nutrition support and careful preoperative assessment are needed for these patients.

**Disclosure of Interest:** None declared.

#### MON-PO413

#### PREDICTION OF 1-YEAR SURVIVAL AFTER RADICAL GASTRECTOMY IN GASTRIC CANCER BY CACHEXIA SCORE ASSESSED BY CT

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**Rationale:** The present study showed that the presence of adipopenia and sarcopenia, as determined using baseline CT, can be used to predict 1-year survival after surgery in patients with gastric cancer. Hence, surgeons should pay more attention to the presence of sarcopenia and adipopenia, as this would aid in preparing timely individualized nutrition therapy.

**Methods:** We reviewed 187 patients with gastric cancer who underwent radical gastrectomy. The patients were categorized into three groups as having CS0 (no sarcopenia or adipopenia), CS1 (having sarcopenia only and no adipopenia) and CS2 (having sarcopenia and adipopenia) according to their third lumbar vertebra skeletal muscle index and fat index calculated using abdominal computed tomography. We compared clinicopathological factors, postoperative complications, 1-year survival after radical gastrectomy, and cause of death among the three groups.

**Results:** Totally, 140 patients (74.9%) had CS0, 38 (20.3%) had CS1 and 9 (4.8%) had CS2. The development of postoperative complications did not differ significantly among the groups. Univariate and multivariate analyses showed that no adjuvant chemotherapy (odds ratio [OR]: 3.9; 95% confidence interval [CI]: 1.4–11.1; P=0.01), tumor stage III (OR: 5.1; 95% CI: 1.2–21.9; P=0.028), CS1 (OR: 10.8; 95% CI: 4.0–34.7; P<0.001), and CS2 (OR: 13.2; 95% CI: 2.1–85.1; P<0.001) were independent factors of 1-year mortality after radical gastrectomy. The main cause of death was cancer-related.

**Conclusions:** CS1 and CS2 were strongly associated with a poor 1-year survival for patients with gastric cancer who underwent radical gastrectomy, suggesting that special attention may be required for nutritional support while determining therapeutic strategies.

**Disclosure of Interest:** None declared.

#### MON-PO414

#### EFFECT OF N2-L-ALANYL-GLUTAMINE IN PATIENTS WITH DIGESTIVE CANCER UNDERGOING TO ONCOLOGICAL SURGERY

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**Rationale:** Cancer patients could present malnutrition. In these patients it is important an adequate nutritional support. TPN improved with glutamine could cover the nutritional requirements. We evaluated the effect of N2-l-alanyl-glutamine in patients with digestive cancer undergoing to oncological surgery.

**Methods:** Prospective, interventional, longitudinal study. 40 patients were included and allocated in two groups; supplemented with glutamine (at a dose of 0.4 g per kg per day) and non-supplemented. All patients were prescribed not less than 1.5 g per kg per day of amino acids while receiving TPN. The measurements were performed at day one and at day seven with the TPN. In both times the nutritional status was evaluated, a blood sample was taken to analyze hematic cytometry, protein metabolism and biochemical data.

**Results:**

**Conclusions:** The N2-l-alanyl-glutamine could have positive effects after 7 days, improving lymphocytes, monocytes. Also the patients present less complications and better nutritional status.



**Table 1** (abstract: MON-PO414): Treatment response on biochemical parameters.

	Group 1 (TPN) n = 19			Group 2 (TPN + N2-l-alanyl-glutamine) n = 21		
	Basal	Final	p Value	Basal	Final	p Value
Lymphocytes (X10 <sup>3</sup> /μL)	1.0 (0.25–2.59)	0.67 (0.35–2.34)	0.240	0.67 (0.23–2.56)	0.90 (0.34–4.56)	0.023*
Monocytes (X10 <sup>3</sup> /μL)	0.69 (0.16–1.48)	0.74 (0.33–2.0)	0.055	0.57 (0.11–2.3)	0.72 (0.48–6.92)	0.009*
Neutrophils (X10 <sup>3</sup> /μL)	8.51 (2.31–25.98)	6.63 (0.52–14.81)	0.314	8.14 (1.67–18.58)	6.04 (0.0–47.96)	0.601
Albumin (g/dL)	2.4 (1.2–3.5)	2.4 (1.3–3.10)	0.74	2.3 (1.4–3.6)	2.2 (1.8–3.4)	0.794
Prealbumin (mg/dL)	8.7 (6.5–13.2)	10.1 (6.5–29.8)	1.00	8.4 (4.3–15.6)	10.5 (5.3–38.2)	0.020
Glucose (mg/dL)	140 (43–268)	125 (86–538)	0.629	106 (76–215)	117 (83–261)	0.068
Urea (mg/dL)	44 (18–117)	42 (22–307)	0.629	28 (12–203)	35 (18–96)	0.225
Creatinine (mg/dL)	0.80 (0.4–3.4)	0.60 (0.2–2.6)	0.005	0.5 (0.2–1.4)	0.5 (0.2–2.8)	0.139
BUN (mg/dL)	21 (8–55)	19 (10–143)	0.794	13 (6–34)	16 (8–45)	0.091

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**Disclosure of Interest:** None declared.

## MON-PO415

### POST-OPERATIVE WEIGHT REDUCTION WORSEN SURVIVAL AFTER GASTRIC CANCER SURGERY

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**Rationale:** Body weight reduction is known to occur to some extent after gastric cancer surgery, but little is known about the influence on the prognosis. The degree of weight reduction after gastrectomy on survival was checked and analyzed, retrospectively.

**Methods:** Three hundred and ninety-seven patients with resected gastric cancer were enrolled in this study, who were operated in our institute from June 2009 to December 2017. Body weight was regularly checked before and after surgery on 9 points (at admission, discharge, 3 months, 6 months, and annually up to 5-year after gastrectomy). Then the weight reduction rates compared by pre-operative status were calculated, and the relationship between the rates and the cancer related survival curves were analyzed.

**Results:** Median weight reduction rates on discharge, at 3, 6 and 12 months after surgery were –6.6%, –10.3%, –11.3% and –11.9%, respectively. As lower quantile of 3 months after surgery was –14.0%, patients were divided into two groups as the lower reduction rate group (Group L > –13.9%, n = 253) and the higher reduction rate group (Group H < –14.0%, n = 85). Group L showed better 5-year survival rates both in the relapse free and overall survival when compared to Group H (p < 0.01, Wilcoxon). Weight reduction rates at 3 months after total (n = 113) or non-total gastrectomy were –12.4% and –9.3%,

respectively (p < 0.01) and the curve lines were never come cross nor close up to 5 years after surgery.

**Conclusions:** Almost all post-gastrectomy patients have lost their weight around –10% compared to pre-operative status within a year. At 3 months after surgery, extreme body weight reduction rate (< –14.0%) seemed to worse both 5-year relapse free and overall survivals. Better peri-operative nutritional aids to sustain patients body weight seem to be crucial.

**Disclosure of Interest:** None declared.

## MON-PO416

### EFFECTS OF PREOPERATIVE SKELETAL MUSCLE MASS AND NEUTROPHIL LYMPHOCYTE RATIO ON THE PROGNOSIS OF STAGE II AND III COLORECTAL CANCER

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**Rationale:** Some studies reported that the decrease of skeletal muscle mass worsens the immune-nutritional status, and related to the poor prognosis in colorectal cancer. We examined the relationship between skeletal muscle mass and immune-nutritional parameters, and the outcome of colorectal cancer patients at our hospital.

**Methods:** We retrospectively analyzed 196 patients of Stage II and III colorectal cancer who underwent curative surgery in our institution between 2007 and 2013. The cross-sectional area of the psoas muscle at the level of the third lumbar vertebra on preoperative computed tomography was assessed to calculate the psoas muscle index (PMI). Patients are divided into high PMI group (H group) and low PMI group (L group) with cut off value based on PMI value for Japanese adults' average (6.36 cm<sup>2</sup>/m<sup>2</sup> for males and 3.92 cm<sup>2</sup>/m<sup>2</sup> for females). Evaluation item were patient background, tumor factor, Onodera nutritional index (PNI), as immunity and nutrition index, neutrophil/lymphocyte ratio (NLR), lymphocyte/monocyte ratio (LMR), platelet/lymphocyte ratio (PLR), overall survival (OS), disease free survival (DFS). The immunity and nutrition index used the 25 percentile value for cut-off.

**Results:** There were 119 cases in H group and 77 cases in L group. In patient factor, gender, age, serum Albumin and BMI showed significant differences between two groups. The 5-year survival was significantly different 82.8% in H group and 70.3% in L group ( $p < 0.01$ ). The 5-year recurrence-free survival was 74.0% in the H group, and 68.3% in the L group ( $p = 0.46$ ). Univariate analysis showed that age ( $70 \leq$ ), CEA ( $0.51 \leq$ ), depth of invasion (T4), lymph node metastasis (N1–3), vascular infiltration (V1–3), preoperative low PMI, high NLR, low LMR, and high PNI significantly related to decrease of OS. Multivariate analysis showed that age, high CEA, deep invasion, lymph node metastasis and L group were independent predictors of poor OS. The immunity and nutrition index weren't the candidate of independent predictors. However, OS was decreased significantly at the high NLR in L group, to examine by stratify immunity and nutrition index.

**Conclusions:** Preoperative PMI and NLR suggested to become prognostic factors in stage II and III colorectal cancer.

**Disclosure of Interest:** None declared.

## Nutrition and chronic disease II

### MON-PO417

#### RISK FACTORS FOR GLOMERULAR FILTRATION RATE IN PATIENTS WITH SHORT BOWEL SYNDROME

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**Rationale:** Chronic renal failure (CRF) is a long-term complication in patients with intestinal failure that is mostly caused by short bowel syndrome (SBS) which seriously affects the patient's quality of life. However, risk factors for CRF in patients with SBS are not clear.

**Methods:** We retrospectively identified patients admitted to our General Surgery department during 2007–2017 who were diagnosed with SBS for more than 6 months. The patients' creatinine, cystatin C, hemoglobin, C-reactive protein, and electrolyte level; computed tomography scans among those tested during their last hospitalization; their surgery records and the doctors' notes were collected. Creatinine and cystatin C levels were used to calculate the glomerular filtration rate (GFR) using the GFRscr-cys equation.

**Results:** Of 235 SBS patients meeting eligibility criteria, median (minimum, maximum) GFR, age, and SBS duration were 127.41 (41.45–321.19) mL/min/1.73 m<sup>2</sup>, 46.37 (4–85) y, and 33.44 (1–324) m, respectively. The age ( $P = 0.006$ ), SBS duration ( $P = 0.024$ ), whether patients had the ileocecal valve ( $P = 0.043$ ), and existing kidney stones ( $P = 0.001$ ) were independent risk factors for low GFR. Moreover, the SBS patients' GFR had a linear relationship with the SBS duration (Pearson  $r = 0.33$ ;  $P = 0.0008$ ).

**Conclusions:** Our study showed that the severity of renal function depended on the duration that patients suffered from SBS. If the ileocecal valve is removed, SBS patients are prone to have low GFR

**Disclosure of Interest:** None declared.

### MON-PO418

#### NOT ALL PATIENTS WITH SHORT BOWEL SYNDROME AND COLON IN CONTINUITY HAVE ELEVATED FASTING AND POSTPRANDIAL RESPONSES OF GLP-1 AND GLP-2: A POST HOC ANALYSIS.

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**Rationale:** Enhanced L-cell response has been reported in ileum-resected short bowel syndrome (SBS) patients with colon in continuity resulting in elevated fasting plasma concentrations and postprandial responses of the enteroendocrine hormones glucagon-like peptide (GLP) 1 and 2 compared to healthy controls.<sup>1</sup> This study aimed to evaluate the generalizability of this claim.

**Methods:** As part of a pilot study evaluating the therapeutic potential of sitagliptin, a dipeptidyl peptidase-4 inhibitor, plasma GLP-1 and GLP-2 were measured before treatment with sitagliptin in eight SBS patients with  $\geq 50\%$  of colon in continuity. Blood samples were drawn fasting and at fixed time points after a standardized meal. In a post hoc analysis, fasting values and areas under the curves (AUC) for GLP-1 and GLP-2 were compared to seven SBS patients and to seven healthy controls from a study by Jeppesen *et al.*<sup>1</sup>

**Results:** In the sitagliptin study, no patient had preserved terminal ileum or ileocecal valve (ICV) while two patients had partly preserved ascending colon. In the Jeppesen study, four patients had terminal ileum and ICV while six patients had partly preserved ascending colon. Comparable fasting values and AUC of GLP-1 were observed between the two patient cohorts (Table 1). When compared to the healthy controls, both fasting values and AUC of GLP-1 were significantly higher in the sitagliptin patients. The sitagliptin patients had significantly lower fasting values and AUC of GLP-2 compared to Jeppesen's SBS patients. However, compared to healthy controls only AUC of GLP-2 was significantly lower.

**Conclusions:** The preservation of the terminal ileum, ICV, and ascending colon may be required for elevated L-cell activation and could possibly explain the differences observed in this post hoc analysis.

#### References

- Jeppesen PB, Hartmann B, Thulesen J, Hansen BS, Holst JJ, Poulsen SS, Mortensen PB. Elevated plasma glucagon-like peptide 1 and 2 concentrations in ileum resected short bowel patients with a preserved colon. *Gut*. 2000;47(3):370–6.

**Disclosure of Interest:** None declared.

**Table 1** (abstract: MON-PO418): Fasting and postprandial hormone responses. A Mann-Whitney U test was used for the statistical analyses.  $P < 0.05$  was considered statistically significant. Data are presented as median (min, max).

		Sitagliptin		Jeppesen <i>et al.</i> <sup>1</sup>		SBS sitagliptin vs. SBS Jeppesen <i>et al.</i> <sup>1</sup>		SBS sitagliptin vs. Healthy controls <sup>1</sup>	
		SBS patients n = 8		SBS patients n = 7	Healthy controls n = 7	Difference	P-value	Difference	P-value
GLP-1	Fasting (pmol/L)	10 (4,25)		10 (5,21)	5 (2,9)	0	0.779	5	0.029
	AUC (h × pmol/L)	61 (28,90)		51 (37,191)	38 (18,52)	10	0.779	23	0.029
GLP-2	Fasting (pmol/L)	16 (9,42)		72 (50,177)	23 (16,54)	-56	<0.001	-7	0.054
	AUC (h × pmol/L)	77 (47,118)		314 (178,711)	169 (78,236)	-237	<0.001	-92	0.009

**MON-PO419**  
**BREASTFEEDING ASSOCIATED WITH EATING BEHAVIOR AND BODY MASS INDEX IN CHILEAN SCHOOL CHILDREN**

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**Rationale:** Is there an association between breastfeeding and body mass index and eating behavior in Chilean school children from 6 to 9 grades?

**Methods:** School children were recruited by convenience (n = 132, mean of age 14.1 ± 1.1), were asked with their mothers how many months they had breastfeeding when they were babies. Additionally, they were evaluated current eating behavior through Three Factor Eating Questionnaire (TFEQ-P19) and Child Eating Behavior Questionnaire (CEBQ); also, current BMI was measured. To compare between groups, Mann-Whitney test was used. The study was developed following the Declaration of Helsinki and approved by the Ethics Committee of the Bernardo O'Higgins University.

**Results:** The children presented mean BMI z score of 1.13 ± 0.92 and 0.78 ± 1 for girls and boys, respectively. Girls who did not receive breastfeeding had a higher BMI z score than those who received (p = 0.05); in boys we did not find significant differences. Boys who did receive breastfeeding showed lower scores on dimensions: food responsiveness, enjoyment of food, desire to drink (p < 0.05) than those who did not have breastfeeding and higher scores in satiety responsiveness dimensions (p < 0.05). Girls did not show differences on eating behavior dimensions according to breastfeeding.

**Conclusions:** There is a difference between current BMI and eating behavior and having received breastfeeding in school children, it is noted that this may be dependent on sexual dimorphism. Interestingly, boys who had breastfeeding showed lower score on food approach (pro intake) dimensions and higher on food avoidant (anti intake) dimensions, where the first types of dimensions have been constantly associated with higher BMI and the second with lower BMI. More studies are necessary to deepen in those eating behavior dimensions that we observed associated with breastfeeding.

**Disclosure of Interest:** None declared.

**MON-PO420**  
**THE FREQUENCY OF PRESCRIPTION'S MODIFICATIONS DURING HOME PARENTERAL NUTRITION (HPN)**

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**Rationale:** Protocols for home parenteral nutrition (HPN) require constant verifying of laboratory tests and patient's status followed by the revisions of the prescription if necessary. There are, however, no studies to examine the frequency of modifications of HPN regimens. The analysis of the latter was the goal of the study.

**Methods:** A retrospective study of the clinical course of 52 HPN patients (31 female – 60%, 21 male – 40%, mean age 56.1) treated between 2016 and 2018 at the Intestinal Failure Center in Skawina was performed. All patients were supervised by the same physician for at least 6 months. A check-up with lab test were performed every 3 months or in any case

of complications. The frequency and type of changes to prescriptions, HPN duration, underlining disease and re-admission to the hospital were performed.

**Results:** The mean duration time of HPN was 72 months (min.7, max. 141, SD±34). Causes of chronic intestinal failure were: short bowel syndrome (83%), motility disorders (8%), extensive parenchymal disease (8%) and intestinal fistulas (2%). The mean number of HPN prescriptions for the treatment period was 4.0 (median 4.5). The mean number of changes to the prescription was 7.0 (median 7.2). Types of modifications: change in quantity/ type of macronutrients (46%/18%), change of the volume (43%), electrolytes (38%) and introduction of the new ingredient (18%). No correlation between the frequency of changes and the length of HPN or underlying disease was found. Most modifications were done during hospitalization.

**Conclusions:** The need for the change of the HPN admixture's composition more depends on clinical and metabolic conditions than on the length of therapy or underlying disease.

**Disclosure of Interest:** None declared.

**MON-PO421**  
**DIAGNOSIS AND MANAGEMENT OF CATHETER-RELATED BLOODSTREAM INFECTION (CRBSI) DURING HOME PARENTERAL NUTRITION (HPN)**

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**Rationale:** According to the most common criteria, catheter-related bloodstream infection (CRBSI) is diagnosed with the microbiological confirmation of paired blood cultures. In home parenteral nutrition (HPN), however, the approach is often different, because the successful rescue therapy of a central venous catheter (CVC) is of the most importance. Therefore, some centers would start antibiotic therapy even in the case of a single positive culture from CVC. The aim of the study was to analyze whether that approach should be used in clinical practice.

**Methods:** A retrospective study comparing results of CVC lumen and peripheral blood cultures were performed. The group of 281 HPN patients (F175 (62%), M 106 (38%), mean age 58,7 years) treated between 2016 and 2018 were analyzed. All lab reports were analyzed and matched with each other.

**Results:** Clinical symptoms of the infection were reported 89 times in 50 patients. In 56 cases microbiological confirmation followed. The CRBSI's criteria were fulfilled only in 61%. In 51 cases CVC's infection was diagnosed, while in only 36 of them positive peripheral blood cultures for the same species were detected. 100% of CVC infection caused by: *C. albicans*, *E. faecalis*, *K. oxytoca*, *K. pneumonia*, *P. agglomerans*, *P. mirabilis*, *S. aureus*, *S. capitis*, *S. haemolyticus* were confirmed in peripheral blood sample and 88% of *E. cloacae* complex; 67% of *E. coli*, 75% of *S. hominis*, 33% of *S. warnerii*.

**Conclusions:** This study illustrates the methodological challenges and variability in diagnosis and management, as well as reporting, of CRBSIs. Paired blood cultures should be performed in patients with suspected CRBSI because CVC line cultures isolates are frequent and useful for diagnosis of CRBSI even without positive blood culture and should be calculated to CRBSI incidence factor.

**Disclosure of Interest:** None declared.



**MON-PO422**  
**ASSESSMENT OF EMPIRICAL ANTIBIOTIC THERAPY FOR CATHETER-RELATED BLOODSTREAM INFECTION (CRBSI) DURING HOME PARENTERAL NUTRITION (HPN)**

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**Rationale:** When CRBSI is suspected in HPN patients and blood cultures results are awaited, empiric antibiotics or other antibacterial lock therapy with a systemic antimicrobial agent should be introduced to save long term central venous catheter (CVC). The purpose of this study was to assess the appropriateness of empiric antibiotic recommendations and to determine if initial empiric antibiotics covered the spectrum of microbes.

**Methods:** A retrospective study assessing current empiric CRBSI treatment at the Stanley Dudrick's Memorial Hospital in Skawina, Poland was performed. A group of 281 HPN patients (F175 (62%), M 106 (38%), mean age 58,7 years) treated from 2016 to 2018 was analyzed. The standard of care for the clinical suspicion of CRBSI was a catheter lock with gentamycin. All reports of blood cultures were analyzed and matched against each other.

**Results:** 89 episodes of suspected CRBSI were diagnosed with clinical symptoms, 82 blood cultures from the catheter and 89 from the peripheral vein were performed. 51 of them came back positive. In 57 cases (70%) catheter antibiotic lock was applied, in 55 cases with Gentamycin. In 30% of cases, the catheter was removed. In 20 cases (35%) the empirical drug covered the real spectrum (18 (33%) for Gentamycin). Regarding the peripheral cultures, 41 came back positive. 31 episodes were empirically treated (15 with Gentamycin). In 19 (61%) and 10 (67%) regarding Gentamycin the spectrum was covered correctly.

**Conclusions:** The study showed the urgent need for a change of the first choice product for catheter lock used for empirical therapy for CRBSI.

**Disclosure of Interest:** None declared.

**MON-PO423**  
**PREDICTIVE FACTORS FOR IMPROVEMENT OF SWALLOWING FUNCTION IN PATIENTS WITH ASPIRATION PNEUMONIA**

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**Rationale:** Pneumonia-related mortality and especially, number of elderly patients with aspiration pneumonia have been increasing in Japan. Swallowing function evaluation, nutrition therapy, and rehabilitation by early intervention of the nutrition support team (NST) are crucial for preventing aspiration pneumonia recurrence in acute phase hospitals. We retrospectively investigated predictive factors for improvement of swallowing function in patients with aspiration pneumonia who underwent videoendoscopic examination of swallowing (VE) at our hospital.

**Methods:** We studied 34 patients with aspiration pneumonia who underwent VE on hospital admission during the one year from April 2018. Patients with food intake level scale (FILS) scores  $\geq 7$  at discharge were judged to have mild dysphagia (Group A, n = 17, 13 men), whereas those with FILS scores  $\leq 6$  at discharge were judged to have moderate

or severe dysphagia (Group B, n = 17, 12 men). Age, sex, body mass index (BMI), skeletal mass index (SMI), serum albumin level at admission, number of days to first NST intervention, and degree of independent living for elderly (DILE) were assessed. Mean values of each item were compared between Groups A and B using the t test.

**Results:** Of the enrolled patients, 25 (74%) were men. Mean age, BMI, and serum albumin level were  $83 \pm 9.4$  years,  $20.1 \pm 4.4$  kg/m<sup>2</sup>, and  $3.0 \pm 0.6$  g/dL, respectively. Mean hospitalisation length was  $24.6 \pm 18.1$  days. Male SMI (Group A vs. Group B:  $5 \pm 0.5$  vs.  $5.9 \pm 0.9$  kg/m<sup>2</sup>,  $p < 0.001$ ), number of days to first NST intervention ( $5.5 \pm 4.4$  vs.  $2.6 \pm 1.6$  days,  $p < 0.01$ ), BMI ( $18.6 \pm 4.4$  vs.  $21.5 \pm 3.7$  kg/m<sup>2</sup>,  $p = 0.03$ ), and DILE ( $2.4 \pm 2.1$  vs.  $4.5 \pm 2.1$ ,  $p = 0.003$ ) differed significantly between Group A and Group B.

**Conclusions:** Patients with aspiration pneumonia with FILS scores  $\geq 7$  with enough oral intake have high SMI and DILE; these factors may be related to swallowing function.

**Disclosure of Interest:** None declared.

**MON-PO424**  
**ASSOCIATION OF THE CHARLSON COMORBIDITY INDEX (CCI) WITH PROTEIN ENERGY WASTING SYNDROME AND INFLAMMATION MARKERS IN PATIENTS ON HEMODIALYSIS**

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**Rationale:** CCI, a scale that assesses comorbidity, is considered a powerful predictor of mortality in patients on hemodialysis (HD). In these, comorbidity intervenes in the development and progression of the protein energy wasting syndrome (PEW), strongly associated with all mortality causes, but there is little data on the relationship between CCI and PEW. The aim of this study was to determine the association of CCI with PEW and the parameters linked to inflammation and thus to comorbidity.

**Methods:** We evaluated 58 patients (38 men); mean age 69.1 (SD 13.2); median time on hemodialysis 28 (3.7–80.8) months, performing anthropometry, bioimpedance, food survey and biochemistry that included albumin, prealbumin, C-reactive protein (CRP) and vitamin 25-OH-D. The diagnosis of PEW was established according to the International Society of Renal Nutrition and Metabolism (ISRNM) criteria. The CCI was calculated applying a modified scale that does not consider albumin and where HD assigns 2 points. Spearman correlation and student-T were used in the bivariate analysis, with a level of significance of  $p < 0.05$ .

**Results:** Out of the 58 patients, 39.7% were diagnosed with PEW, 75.9% had albumin  $< 3.8$  g/dl and 51.7% had prealbumin  $< 30$  mg/dl. Median CCI: 7.15 points (5.4–9.15). Vitamin 25-OH-D levels (ng/ml) were  $< 15$  in 32.8%, between 15–30 in 31% and  $> 30$  in 13.8% of the patients. We found significant negative association of CCI with albumin ( $p = 0.011$ ) and prealbumin ( $p = 0.002$ ) but not with CRP ( $r = 0.202$ ;  $p = 0.139$ ), PEW syndrome or vitamin D status.

**Conclusions:** The clinical relevance of the CCI in our patients is limited since it is not associated with nutritional status and therefore not useful to establish therapies that improve malnutrition and reduce mortality. On the other hand, it correlates with simpler and available markers as albumin, considered a strong predictor of mortality.

**Disclosure of Interest:** None declared.

### MON-PO425 THE PHASE ANGLE AS AN INDICATOR OF MALNUTRITION AND COMORBIDITY IN PATIENTS ON MAINTENANCE HEMODIALYSIS

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**Rationale:** The phase angle (PA) has shown a good correlation with the nutritional parameters and survival in maintenance hemodialysis (MHD) patients. On the other hand, for these patients, subjective global assessment (SGA) is a method of nutritional evaluation recommended by the guidelines, and Charlson comorbidity index (CCI), is considered a powerful predictor of mortality. The aim of this study was to determine the association of PA with SGA and CCI.

**Methods:** We evaluated 107 patients (69.2% men) on MHD, mean age 68.4±12.8, median time on hemodialysis 26.5 months (3.5–80.8), performing anthropometry, bioimpedance, modified quantitative SGA that rates 8 items and CCI. We consider the existence of nutritional risk when SGA>8 points and the presence of severe malnutrition when SGA>15 points. The CCI was calculated applying a modified scale that does not consider albumin and where HD assigns 2 points. ANOVA and Student-T tests were used in the bivariate analysis, with a level of significance of  $p < 0.05$ .

**Results:** The mean PA at a frequency of 50 kHz was 4.5°±1.3; median 4.5 (3.4–5.3); 34.6% had a PA<4°; the mean was significantly higher in men than women (4.8°±1.3 vs 3.8°±0.8;  $p < 0.001$ ) and in those aged ≥ 70 than in those of age < 70 (4.0°±1.0 vs 5.1°±1.3;  $p < 0.001$ ). The mean SGA was 12.5; median 11 (9–15); 17% of the patients had SGA < 8; 54.7% had SGA 9–14 and 28.3% SGA = > 15. The mean CCI was 7.7; median 8 (6–9.6); 45.8% of the patients had CCI < 8; 17.8% had CCI 8–9.6 and 17.8% CCI > 9.6. We found a negative relationship between PA and SGA and between PA and CCI with statistical inter-group difference ( $p < 0.001$ ).

**Conclusions:** In these patients on MHD, the PA, an easily available parameter, presents a strong association with the more time-consuming SGA and CCI. Although PA is considered an early marker of malnutrition, in this study it showed a greater ability to identify patients with severe malnutrition.

**Disclosure of Interest:** None declared.

### MON-PO426 ASSOCIATION BETWEEN INFLAMMATORY SITUATION AND VITAMIN 25-OH-D STATUS IN PATIENTS ON CHRONIC HEMODIALYSIS

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**Rationale:** Vitamin D has extraosseous pleiotropic effects and its deficit is associated with cardiovascular mortality, the main cause of death in hemodialysis patients. The aim of this study was to analyze the correlation between markers and pathologies linked to inflammation and vitamin D status

**Methods:** We evaluated 52 patients (36 men), mean age 69 (SD 14), median time on hemodialysis 39.9 months (10–84), performing

vitamin 25-OH-D, C-reactive protein (CRP), albumin and prealbumin levels. We applied a combined criteria: diabetes and/or ischemic cardiopathy (IC) and/or Ictus, and considered levels of vitamin D < 15 ng/ml indicative of severe deficit, between 15 and 30 insufficient and >30 optimal.

**Results:** CRP (mg/L): median 4 (2–8); Albumin (g/dl): mean 3.5 (SD 0.4); Prealbumin (mg/dL): mean 29.8 (SD 8); Vitamin D (ng/ml): median 17 (12–25.75); the levels were deficient in 42.3%, insufficient in 40.4% and optimal in 17.3% of patients. We did not find vitamin D association with albumin and prealbumin. A positive association with CRP was found ( $r = 0.298$ ,  $p = 0.032$ ) and its mean tended to increase as the status improved. The vitamin D mean in the 17 patients with CRP < 3 was 16.76 (SD 8.75) and in the 35 with CRP ≥ 3 was 23.8 (SD 16.6) ( $p = 0.108$ ). The mean CRP in patients who did not meet the combined criteria was 10.44 (SD 16.22) and in those who met it, 18.18 (SD 30.23) ( $p = 0.203$ ); 54.5% of patients with vitamin D levels < 15 met the combined criteria whereas those with levels > 15, only 32% did ( $p = 0.118$ ).

**Conclusions:** Only 17.3% of patients show optimal levels of vitamin 25-OH-D and >50% have CRP ≥ 3. Our results regarding association between inflammatory situation and vitamin D status could be justified by insufficient sample size, lack of sensitivity of the methods used to detect inflammation and also because, given the existence of vitamin D deficiency in most patients, it is not possible to demonstrate anti-inflammatory action.

**Disclosure of Interest:** None declared.

### MON-PO427 FUNCTIONAL AND NUTRITIONAL STATUS OF THE PATIENTS WITH SUBACUTE STROKE AT ADMISSION AND AT DISCHARGE FROM THE BRAIN INJURY UNIT OF LA PEDRERA LONG-STAY HOSPITAL (HLP)

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**Rationale:** The aim of the study is to describe the functional and nutritional status of subacute stroke patients at admission and at discharge from the Brain Injury Unit of the HLP.

**Methods:** This is a descriptive study of a cohort of 198 patients diagnosed with a subacute stroke that were admitted consecutively during the period of May 2013 to May 2016.

The analysed parameters were the following:

- Sex and age.
- Risk of malnutrition via 'Mini Nutritional Assessment' (MNA).
- Nutritional analytic parameters (albumine, cholesterol, lymphocytes).
- Nutritional anthropometric parameters (weight, index body mass).
- Score of Barthel Dependency Scale.
- Rankin Physical Disability Scale.

Statistical analysis was carried out using the SPSS 23.0 software

**Results:** There was a weight reduction and a BMI decrease after discharge compared to the moment of admission. An increase on the MNA malnutrition scale was observed from admission to discharge, changing from a state of malnutrition to risk of malnutrition. The average of functional dependence according to the Barthel scale changed from total dependence upon admission to moderate dependence upon discharge. The average disability according to the Rankin scale at discharge was also moderate disability, improving from moderately severe disability upon admission. The parameters presenting statistical significance between admission and discharge are reflexed in Table 1.

Parameter	P value
BMI	0.001
Barthel	<0.0005
MNA	0.02
Rankin	<0.0005
Malnutrition lymphocytes	<0.0005
Malnutrition albumin	0.016

**Conclusions:** At discharge, patients presented an improved nutritional state in anthropometrical and analytical parameters, and in the risk of malnutrition. There was also an improvement in functionality and disability grade. More studies are necessary to observe the relationship between a nutritional improvement and a functional improvement.

**Disclosure of Interest:** None declared.

#### MON-PO428

##### EXTRACELLULAR MASS-TO-BODY CELL MASS RATIO A NUTRITIONAL-HYDRATION MARKER IS AN INDEPENDENT PREDICTOR OF SURVIVAL IN HEMODIALYSIS PATIENTS

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**Rationale:** Extracellular mass-to-body cell mass ratio (ECM/BCM), which reflects the proportions of intra and extracellular spaces, is considered a sensitive index of being wasted-overloaded in dialysis patients. This study aimed to explore the relationship between the nutritional-hydration status measured by the ECM/BCM ratio and survival in hemodialysis patients (HD)

**Methods:** A retrospective observational study in 56 HD patients (mean age: 75.9; men: 29(51.8%);time on HD: 34.8) for 30-months of follow-up. Demographic, clinical, biochemical data and assessment of protein-energy wasting (PEW) by malnutrition-inflammation score were performed. The ECM/BCM ratio was measured by bioimpedance analysis (RJL-System-Bia 101) and the optimal cut-off point of 1.20 by Receiver operating characteristic curve (ROC curve) as criterium for diagnosing wasting-hyperhydration was applied. Log-rank test was used to assess the differences between survival curves. Independent predictors of survival were determined by Cox regression analysis. Calculations were performed using SPSS v.21 and Stata softwares<sup>1</sup>.

**Results:** PEW was identified in 67.9% of HD patients. The cut-off point for screening PEW was 1.20 by ROC curve (area under the curve) of 0.79 ( $p < 0.001$ ). The cumulative observed survival of pts with enrollment ECM/BCM ratio  $\leq 1.20$  was significantly better than those with  $> 1.20$  ( $p = 0.009$ ). In the multivariate Cox proportional hazards model, after adjusting for age, gender and time on HD, the ECM/BCM ratio remained an independent predictor (HR = 8.9;  $p = 0.035$ ) of mortality.

**Conclusions:** The ECM/BCM ratio a marker of being wasted-overhydrated was an independent predictor of long-term survival in HD patients.

**Disclosure of Interest:** None declared.

#### MON-PO429

##### DIETARY SODIUM INTAKE: KNOWLEDGE, ATTITUDES AND PRACTICES AMONG YOUNG TO MIDDLE-AGED ADULTS OF ECUADOR: A PILOT STUDY

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**Rationale:** Currently, cardiovascular diseases (CVD) are the leading cause of death worldwide. A risk factor for CVD is high blood pressure, a condition that is associated with a high consumption of sodium in the diet. According to the World Health Organization (WHO), the current recommendation for sodium is 2000 mg of sodium per day. Identify the main sources of sodium of the Ecuadorian diet and determine the knowledge, attitudes and practices related to the use of salt in young adults between 25 and 64 years of age in the city of Quito.

**Methods:** Cross-sectional study. There was a random sample for convenience of 177 employees (men and women between 25 and 64 years old) of the Hospital de los Valles and the San Francisco University of Quito. The collection of sociodemographic, anthropometric data (weight and height) and the taking of blood pressure in subjects was performed. A questionnaire of frequency of consumption, a questionnaire of knowledge, attitudes and practices was use and a single sample of urinary sodium excretion was collect in 24 hrs.

**Results:** Nearly 97% of participants had a misperception about their sodium intake, 98.9% know that a diet high in salt causes health problems, but only 38.4% do something systematically to regulate their intake of salt. Moreover, there are no significant differences between the means of sodium consumption ( $p = 0.870$ ) of those subjects who regulate their salt intake (2689 mg/day) compared to those who do not take any action (2681.74 mg/day)

**Conclusions:** There is a misperception about sodium consumption. Only a small group of subjects takes actions that would help reduce their consumption, not being effective. The foods most frequently consumed were meat products and soft drinks.

**Disclosure of Interest:** None declared.

#### MON-PO430

##### LINK BETWEEN NUTRITIONAL STATUS, ANXIO-DEPRESSIVE SYMPTOMS AND HYPERACTIVITY IN SEVERELY MALNOURISHED ADULT ANOREXIA NERVOSA (AN) INPATIENTS AT ADMISSION AND DURING NUTRITIONAL CARE

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**Rationale:** The link between nutritional status and psychiatric symptoms in malnourished AN patients is described since two decades, but has not been described in an homogeneous sample of very severely malnourished patients. The aim of this study was to describe the evolution of anxio-depressive symptoms, and hyperactivity after nutritional care in a sample of very severe malnourished AN patients.

**Methods:** All consecutive very severe malnourished AN adult patients (DSM-5), hospitalized in a clinical nutritional unit between July 2018 and February 2019 were included. Psychiatric symptoms were assessed by self-report questionnaires: anxio-depressive symptoms by Beck Depression Inventory II (BDI II) and Hospital Anxiety and Depression Scale (HADS), obsessive-compulsive symptoms by Maudsley Obsessive-Compulsive Inventory (MOCI), social phobia symptoms by using Liebowitz Social Phobia Scale (LSAS) and Godin Leisure time exercise to assess physical activity. Patients were evaluated at admission and at discharge.

**Results:** Thirty-nine patients (2 Men/37 Women), age:  $30.2 \pm 11.4$  years, BMI:  $12.6 \pm 2.7$  kg/m<sup>2</sup>, Albumin:  $36.5 \pm 9.1$  g/L, TTR:  $0.310 \pm 0.110$  mg/L were included; scores levels of psychiatric symptoms were high:  $51.2 \pm 16.3$  for BDI,  $34.3 \pm 2.9$  for HAD,  $43 \pm 2.3$  for MOCI,



97.9 ± 29.5 for Liebowitz and level of physical activity was important 41.1 ± 60.8 for Godin time exercise. After 6 ± 4 weeks of nutritional care all patients improved their nutritional status (Delta-BMI 2 + 0.5,  $p < 0.05$ ) and decrease significantly their psychiatric symptoms. Weight gain was not link to trends to be associated with the decrease of depressive symptoms (BDI  $r = -0.5$ ,  $p = 0.07$ ) and with social phobia (LSAS  $r = -0.41$   $p = 0.08$ ).

**Conclusions:** In very severely malnourished AN patients following enteral nutrition, a decrease of depressive symptoms and social phobia has been observed along with an improvement of nutritional status. This study suggest that nutritional care contributes not only to somatic treatment of AN, but also to the treatment of at least a part of anxio-depressive symptoms. Larger prospective studies are needed to confirm these results.

**Disclosure of Interest:** None declared.

#### MON-PO431 CARDIOVASCULAR RISK IN HOME PARENTERAL NUTRITION PATIENTS.

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**Rationale:** Atherosclerosis is usually the result of a number of risk factors. Some of them (e.g. total cholesterol level, body mass index) are modified in parenteral nutrition (PN) patients group. This could results in changes of the cardiovascular risk. The cardiovascular risk could be estimated using one of the risk estimation systems, eg.: Systemic Coronary Risk Estimation (SCORE) or Framingham risk score. SCORE calculates 10-year risk of CVD mortality and Framingham risk score – 10-year risk of hard coronary events. The aim of the study was to estimate the cardiovascular risk for PN patients.

**Methods:** Forty eight patients without cardiovascular disease diagnosis were recruited into the study: 24 PN patients and 24 control – healthy volunteers (HV). 12 women and 12 men in the PN group and 13 women and 11 men in the control group participated in the study. Patients in both groups were matched for age (mean: PN – 62.25 ± 5.06 years; HV – 61.83 ± 5.82 years;  $p = 0.79$ ), body mass index (mean: PN – 22.77 ± 2.8; HV – 24.01 ± 1.75;  $p = 0.07$ ) and smoking history (number of smokers: PN -13, HV-11;  $p = 0.56$ ). Total cholesterol and its lipoprotein fractions serum level were examined. Brachial systolic blood pressure (SBP) was measured for each patient. The assessment of total cardiovascular disease (CVD) risk was performed using SCORE chart and Framingham risk score (10-year risk of CVD and 'heart age'). All subjects provided written informed consent. Characteristics of the study population were recorded and compared using the Student's t-test, Mann-Whitney U test, Kendall's tau-b test, Kolomogorov-Smirnov test and Pearson's chi-squared test.

**Results:** Total (mean: PN – 136.04 ± 41.45; HV – 221.37 ± 40.81 mg/dl;  $p < 0.05$ ) and HDL (mean: PN – 44.87 ± 13.03; HV – 77.04 ± 23.91 mg/dl;  $p < 0.05$ ) cholesterol were lower in the PN patients. Total CVD risk was lower in the PN patients in SCORE chart, but not in the Framingham risk score and in the 'heart age' (SCORE: PN – 3.79 ± 2.69% vs HV – 5.04 ± 4.88%,  $p < 0.05$ ; Framingham: PN-17.9 ± 15.38% vs HV- 20.44 ± 14.19%,  $p = 0.53$ ; heart age: PN-66.42 ± 11.86 vs HV-72.21 ± 11.92 years,  $p = 0.42$ ).

**Conclusions:** Parenteral nutrition patients have lower cardiovascular risk than patients from the control group in SCORE chart. The further studies are necessary to determine if it is confirmed by the incidence of the CVD in parenteral nutrition patients.

**Disclosure of Interest:** None declared.

#### MON-PO432 DAILY SODIUM INTAKE IN ANURIC HEMODIALYSIS PATIENTS AND INTERDIALYTIC WEIGHT GAIN

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**Rationale:** To examine whether sodium reduction dietary consultation in anuric hemodialysis (HD) patients, as a single tool, will lead to reduced fluid Intra dialytic weight gain (IDWG) while preventing nutritional deterioration.

**Methods:** Open-label prospective cohort study in which subjects are compared to themselves. One medical center. 17 HD adults patients with renal function of less than 200 ml per 24 hours, more than 3 months in HD with IDWG of more than 2.2 kilograms or 4% from the dry body weight, in two mid-week sessions.

Subjects were evaluated in 3 periods: baseline before intervention (time 0), after 4 weeks of intervention and after 12 weeks intervention, accompanied by dietitian with specialization in the nephrology. In each period, the following parameters were examined and evaluated: IDWG, sodium intake, systolic and diastolic blood pressure along the dialysis treatments, routine biochemical and hematological blood tests nutritional status and dietary intake. The quality of life index was measured by SF-36 at time 0 and end after 12 weeks. The IDWG was based on the weight difference between two adjacent dialysis treatments. Average of 6 adjacent treatments. The nutritional status was carried out using the 7 points Subjective Global Assessment tool. The assessment of dietary intake was collected by 24-h recall for 3 days per period. Sodium intake was also evaluated by blood sodium, throughout the 3 study periods. Dietary intervention was a total of 4 weeks and included nutritional counseling to reduce salt from the diet according to patient preferences and adjusted for hyperkalemia.

**Results:** There was a significant decrease in IDWG between treatment after 4 weeks, but not after 12 weeks. The IDWG decreased from 3.48 ± 0.93 to 2.89 ± 0.89 ( $p < 0.001$ ) after 4 weeks of intervention but increased to 3.3 ± 0.99 at 12 weeks to 0 time. The decrease after 4 weeks was not attributed to the change in sodium intake alone because there was no significant decrease in sodium intake. No significant differences were found in the three study periods: systolic and diastolic blood pressure at the beginning of dialysis, duration and end of dialysis, biochemical and hematologic tests (except ferritin decline), nutritional status, or dietary parameters.

Six of the 17 participants were able to reduce sodium and maintain their low intake throughout the 12-week study period. Among the 'successful', the change in fluid accumulation after 12 weeks was significant and decreased from 3.44% to 2.77% (change of 0.66%  $p < 0.05$ ). No nutritional status was found in calories, protein and electrolytes consumed. In the group that did not change sodium intake, there was a significant decrease in the accumulation rate only after 4 weeks from 3.5% to 3.1%, but the decrease did not persist after 12 weeks and the fluid accumulation rate returned to 3.5%. There was no significant change in blood pressure in nutritional status or in dietary parameters that were significantly examined throughout the study. The quality of life decreased significantly between the beginning and end of the study at an average of 6.6 points with a median decrease of 3 points ( $p < 0.05$ ).

**Conclusions:** Dietary guidance for dietary sodium reduction in anuric HD patients was found to help maintain IDWG reduction between adjacent hemodialysis treatments for at least 12 weeks while maintaining nutritional status. Adherence to treatment is not high and requires close nutritional monitoring.

**Disclosure of Interest:** None declared.

**MON-PO433****EXAMINE THE ROLE OF HEALTH PERCEPTION, SELF-EFFICACY AND USE OF SOCIAL MEDIA ON QOL OF HOME PARENTERAL NUTRITION (HPN) PATIENTS IN POLAND AND ISRAEL**

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**Rationale:** Quality of life (QOL) of HPN patients is a critical issue for functioning and survival. A better evaluation of the factors influencing this QOL can guide clinicians to provide significant advantages and advices for better outcome. We aimed to investigate these factors by evaluating the role of health perception, self-efficacy and use of social media in QOL of HPN patients

**Methods:** We included 204 participants (148 from Poland and 55 from Israel) that completed validated questionnaires for QOL, illness perception, self-efficacy, and the use of social media. A z score was used to equate means and variances for QOL questionnaire. Statistical analysis was based on Stepwise Regression, T-Test, and Pearson correlation between variances. The Helsinki committees of both medical centers waived the requirement for informed consent and approved the study.

**Results:** A significant higher positive QOL was recorded in Polish patients compared to Israelis ( $-0.1723 \pm 0.46$  and  $0.5131 \pm 0.45$ ,  $p < 0.001$  respectively). However, Israeli patients had a significant higher self-efficacy score, meaning that their motivation and ability to overcome hardships associated with their disease were high ( $4.3 \pm 1.9$  and  $5.3 \pm 2.2$ ,  $p < 0.002$  respectively). A stepwise regression equation showed that QOL could be predicted by the variances of independent variables ( $R^2 = 0.439$ ,  $p < 0.0001$ ), self-evaluation physical health status ( $R^2 = 0.152$ ,  $p < 0.0001$ ), the use of social media ( $R^2 = 0.189$ ,  $p < 0.0001$ ), and the level of self-efficacy ( $R^2 = 0.207$ ,  $p < 0.0001$ ).

**Conclusions:** Physical changes that affect health and daily function, self-efficacy, and increase in social relationships by receiving emotional support through social networks are important factors for QOL improvement. These findings should guide health professionals in the management of this population.

**Disclosure of Interest:** None declared.

**MON-PO434****SOCIAL MEDIA AND SEXUAL ACTIVITY OF HOME PARENTERAL PATIENTS**

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**Rationale:** Social support is one of the most widely used and studied strategies for encouraging behavior change in social networks. Patients that use social media as their source of information shown improved health outcome and better chronic disease management. This study aims to examine the correlation between the use of social media and

self-definition of self-efficacy for the physical and sexual functioning of chronic patients receiving home parenteral nutrition (HPN).

**Methods:** The data were collected using self-administered questionnaire to HPN patients in 2 large centers. Statistical analysis was based on T-Test and Pearson correlation between variances. The ethics committees waived informed consent request

**Results:** 148 (Poland) and 55 (Israel) patients were included. Mean HPN duration was  $9.7 \pm 7$  years in Poland, and  $12 \pm 9.6$  years in Israel. Only 61 patients had a stoma (data was not available in 15 patients). 20.6% were singles, 52% married, 12.2% divorced, 14.7% widows, and 0.5% missing. The younger HPN patients used more social media and they were more sexually active ( $R = .462$ ,  $p < 0.000$ ), their self-efficacy was higher ( $R = .224$ ,  $p < 0.001$ ), and they were rating their physical condition higher ( $R = .405$ ,  $p < 0.0001$ ). Patients with a stoma were significantly less sexually active rating without stoma ( $p < 0.0001$ ). Patients with stoma rated their self-efficacy lower than patients without stoma (mean  $4.1 \pm 1.8$  versus  $4.8 \pm 2.2$ , respectively,  $p < 0.004$ ). Israelis were more sexually active than Poland patients were ( $1.7 \pm 8$ ; versus  $1.5 \pm 7$ ,  $p < 0.03$  respectively). Patients that use social media more often were more sexually active ( $R = .215$ ,  $p < 0.003$ ).

**Conclusions:** Younger patients that are more involved in social media activity are also more physically and sexually active. Patients with Stoma evaluate their self-efficacy as lower and are sexually less active. Social media has a positive effect on the sexual life of HPN patients.

**Disclosure of Interest:** None declared.

**MON-PO435****DISEASE RELATED MALNUTRITION IN PATIENTS WITH PULMONARY TUBERCULOSIS (TB), ATTENDING DISTRICT CHEST CLINICS (DCC) OF COLOMBO AND GAMPAHA DISTRICTS.**

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**Rationale:** TB is one of the most prevalent communicable diseases in Sri Lanka. Even though the association between malnutrition and TB is well recognized, available data on the Sri Lankan situation of the above relationship is inadequate.

The aim of this study was to reveal the prevalence of disease related malnutrition among pulmonary TB patients in Sri Lanka.

**Methods:** A descriptive cross sectional study was carried out including 257 pulmonary TB patients. Sample calculated with 1.96 standard normal deviate for 5%  $\alpha$  error and desired level of precision of 5%. A content validated and pretested interviewer administered questionnaire, 24 hour dietary recall, physical examination and anthropometry were done. Data analysis done with SPSS version 22. Descriptive statistics, cross tabulation, correlation and paired t test were carried out to ascertain prevalence and relationships. Statistical significance was taken as  $p > 0.05$

**Results:** There were 72.8% males and 27.2% females. At the interview 56.4% of patients had BMI  $< 18.5$  kg m<sup>2</sup> (56.2% males, 57.1% females) and 23.7% were severely thin. Mean BMI from  $18.6 \pm 3.9$  kg m<sup>2</sup> recorded at initiation, showed improvement with treatment  $18.8 \pm 4.9$  kg m<sup>2</sup>, which was not statistically significant. Half of patients (47.8%) experienced impairment of functional capacity. One third (33% and 29.1%) of patients were identified as having fat and muscle loss respectively. Gender, ethnicity, level of education, smoking and alcoholism significantly associated with presence of malnutrition, whereas age, occupation, monthly income or presence of diabetes or hypertension were not associated.

**Conclusions:** More than half of pulmonary TB patients had malnutrition and one fourth of them were severely malnourished. There was no

significant improvement of nutritional status with anti TB treatment. There is a need of addressing malnutrition in TB patients.

**Disclosure of Interest:** None declared.

#### MON-PO436

##### RELATIONSHIP BETWEEN NUTRITIONAL SCREENING TESTS AND BIOCHEMICAL PARAMETERS IN STROKE PATIENTS

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**Rationale:** Malnutrition is common in stroke patients and evaluation and monitoring nutritional status with screening tests and laboratory methods is very important. The aim of this study is to evaluate the nutritional status of stroke patients and to determine the relationship between nutritional screening tests and biochemical parameters.

**Methods:** This prospective study was conducted on 42 acute stroke patients. Nutritional status were screened with Nutritional Risk Screening 2002 (NRS-2002) and Mini Nutritional Assessment (MNA). All patients were evaluated for routine biochemical analyses including albumin, pre-albumin, complete blood count, iron, vitamin B12 and lipid profile. Individualized nutritional support was provided for patients with NRS-2002 score  $\geq 3$ . Screening tests and biochemical parameters were performed in first visit and after 4 weeks later. Statistical analyzes were performed to determine the relation and correlation between the data.

**Results:** The mean age of patients was  $67.1 \pm 16.9$  years. The average MNA score was  $22.44 \pm 3.13$ . While 15 patients were under malnutrition risk, 7 patients were found to be malnourished at admission. Serum albumin and prealbumin levels were significantly lower in patients under the risk of malnutrition and malnourished group ( $p < 0.05$ ) but the other indexes of malnutrition were not different. MNA scores were higher after nutritional intervention ( $p < 0.001$ ), but biochemical parameters did not differ significantly. No correlation was found between screening tests and biochemical parameters.

**Conclusions:** There is no ideal biochemical parameter to show the nutritional status in stroke patients. Screening tests are more sensitive in the diagnosis and short-term follow-up of the nutritional status.

**Disclosure of Interest:** None declared.

#### MON-PO437

##### CONSUMER KNOWLEDGE AND USE OF FOOD AND NUTRITION LABELLING IN SOUTH AFRICA

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**Rationale:** The non-communicable disease burden can be addressed through population-wide interventions, including the promotion of healthy diets through the provision of adequate nutrition information on food labels. This study aimed to determine consumer knowledge and reading of nutrition information on food labels; the self-reported impact of food and nutrition labelling on purchasing behaviour; and barriers to and expectations of reading nutrition information.

**Methods:** In this cross-sectional descriptive study, an interviewer-administered electronic survey was conducted on adult consumers (N = 960) at 16 randomly selected grocery stores (from the four main food retailers in South Africa) in four health districts of Cape Town, Western Cape, South Africa. Data from the survey was exported from SurveyMonkey® to Microsoft Excel and analysed using STATISTICA

Version 13. The relation between nominal variables was investigated with contingency tables and likelihood ratio chi-squared tests. Regression analysis of a continuous response variable versus ordinal input was done and the strength of the relationship was measured with Spearman correlation. A  $p$ -value of  $p < 0.05$  represented statistical significance.

**Results:** Only 36.0% of participants indicated that they frequently/always read nutrition information on food labels. Older individuals ( $p < 0.05$ ), white participants ( $p < 0.001$ ), those with a higher level of education ( $p < 0.001$ ) and income ( $p < 0.001$ ) read nutrition information more frequently. The main reasons for not reading nutrition information included buying the same type of product all the time (34.28%) and not being interested in the nutrition information (31.44%). The mean food and nutrition label knowledge score was 44.4% (fair or below average) with those that often read the nutrition information on labels having a significantly higher score ( $p < 0.01$ ). Main factors influencing food purchasing behaviour included price (81.25%), sell-by date (89.16%) and products on special/promotion (87.08%). Participants would prefer less complex terminology (79.69%), more pictures/colours (71.15%), a single health endorsement logo (73.33%) and bigger font sizes (69.17%) to be used on food labels.

**Conclusions:** Cape Town consumers have fair food and nutrition label knowledge and do not regularly read nutrition information on labels. This could explain why nutrition information was not mentioned as an important determinant of food purchasing. More should be done to educate consumers on utilizing the nutrition information on food labels to make healthier food choices and to simplify food labels for consumers.

**Disclosure of Interest:** None declared.

#### MON-PO438

##### THE DIABETES RISK EVALUATION WITH FINDRISK IN HEALTHY ADULTS: KAYSERI/TURKEY

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**Rationale:** Today, there are many tools for assessing the risk of diabetes in adults. Especially for this purpose, the FINDRISK is a screening tool that can be easily used in daily practice. The assessment made with this survey determines the individual's risk of having diabetes within the next 10 years.

**Methods:** This study was conducted to evaluate the risk of diabetes with FINDRISK screening on 1500 healthy subjects, aged 18 years and older in Kayseri/Turkey. Demographic information of the participants was recorded by face-to-face interviews with the questionnaire. Body weight, height, waist and hip circumference were measured and Body Mass Index ( $\text{kg}/\text{m}^2$ ) was calculated. Individuals were grouped according to WHO BMI standards. Diabetes risk of participants had been tried to be revealed by FINDRISK. FINDRISK score of 15 and above was accepted as high risk in terms of Type 2 diabetes.

**Results:** There was a statistically significant relationship between total FINDRISK score and gender ( $p < 0.05$ ). While 15.2% of the women were in high risk group, 12.4% of the men were in high risk group. The percentage of the women in the low risk group (35.9%) is less than the men with low risk of diabetes (38.5%). As the BMI increased, the individuals were found to have a high risk compared to FINDRISK.

**Conclusions:** As a result of this study, it has been shown that the use of FINDRISK screening tool can be an effective way to detect the risk of diabetes in practice.

**Disclosure of Interest:** None declared.



**MON-PO439****IMPACT OF NUTRITION SUPPORT TEAM (NST) FUNDING FROM THE BELGIAN NATIONAL HEALTH INSURANCE (NHI) ON THE QUALITY OF CARE OF HOME PARENTERAL NUTRITION (HPN) IN ADULTS WITH BENIGN DISEASES**

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**Rationale:** Six Belgian academic hospital NSTs received from 2011 to 2017 a funding from the NHI for the follow-up of adult HPN-patients with benign diseases. We reviewed the NHI requested quality of care annual reports aiming to analyse the impact of their funding on NST performance while comparing it with existing data.<sup>1</sup>

**Methods:** Patient data were extracted from seven annual reports (2011–2017) of six Belgian NST academic units involving only adults HPN-patients with benign diseases. Reported data are: Age, HPN-incidence and prevalence, HPN-related hospitalisation days/yr, catheter-related blood stream infection/1000 HPN days (CRBSI), number of catheter replacements/yr and patient autonomy. Statistical analysis involves linear regression.

**Results:** Mean adult prevalence was 14/million/yr, range [11–19]. Mean adult incidence was 4,7 [3,2–6,2] adults per million/yr. Mean age: 55 [18–93]. Sex ratio F/M: 0,57 [0,58–0,7]. This represented 634 catheter yr during 7 yr. The main HPN indication was short bowel syndrome 59,6%. Mean rate of CRBSI was 0,6 [0,4–0,8]. The mean number of catheter replacement/HPN/yr was 0,31 [0,21–0,43]. The mean number of HPN-related hospitalisation days/yr was 3,26 [1,97–5,00] with a significant increase: 1.97(2011)–5.00(2017) (p < 0,05) but this remains a small number. 90% of adults are independent on daily medical aid and have normal (26%), partially (45%) or no activity (19%).

**Conclusions:** This study demonstrates that the funding of NST in academic hospitals has allowed to assess and ultimately to control the number of new cases, to show a lower the HPN- complications than data,<sup>1</sup> and to favour patient autonomy.

**Reference**

1. Dreesen M *et al. Clinical Nutrition.* 2013;32:16–26.

**Disclosure of Interest:** N. Umbrain Grant/Research Support from: Belgian National Health Insurance, D. Hermans Grant/Research Support from: Belgian National Health Insurance, P. Schlessers Grant/Research Support from: Belgian National Health Insurance, M. Hiele Grant/Research Support from: Belgian National Health Insurance, M. Van Winckel Grant/Research Support from: Belgian National Health Insurance, D. Ysebaert Grant/Research Support from: Belgian National Health Insurance, A. Van Gossum Grant/Research Support from: Belgian National Health Insurance.

**MON-PO440****IMPACT OF NUTRITION SUPPORT TEAM (NST) FUNDING FROM THE BELGIAN NATIONAL HEALTH INSURANCE (BNHI) ON THE QUALITY OF CARE OF HOME PARENTERAL NUTRITION (HPN) IN CHILDREN WITH BENIGN DISEASES**

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**Rationale:** Five Belgian academic hospital NST received from 2011 to 2017 a funding from the BNHI for the follow-up of children HPN-patients with benign diseases. We reviewed the NHI requested quality of care annual reports aiming to analyse the impact of their funding on NST performance while comparing it with existing data.<sup>1</sup>

**Methods:** Patient data were extracted from seven annual reports (2011–2017) of five Belgian NST academic units involving only children HPN-patients with benign diseases. Reported data are: Age, HPN-incidence and prevalence, HPN-related hospitalisation days/yr, catheter-related blood stream infection/1000 HPN days (CRBSI), number of catheter replacements/yr and patient autonomy. Statistical analysis involves linear regression.

**Results:** Mean children prevalence was 12,4/million/yr, range [10–14,8] and mean children incidence 2,6 patients/million/yr, range [0,8–4]. Mean age: 6,8 yr range [7 months–17 yr]; gender ratio F/M-ratio 1,97. This represented 177 catheter yr over 7 yr. The main HPN indication was short bowel syndrome 55%. Mean rate of CRBSI was 1,04/1000 HPN-days, range [0,6–1,6]. The mean number of catheter replacement/yr HPN was 0,47 range [0,40–0,56]. The mean number of HPN-related hospitalisation days/yr was 4,9 range [4,0–5,7]. Average 62% of children are able to go to school with parents continuing their working activities.

**Conclusions:** This study demonstrates that the funding of NST in academic hospitals has allowed to assess and ultimately to control the number of new cases, to show lower HPN-complications than data,<sup>1</sup> and to favour patient autonomy.

**Reference**

1. Dreesen M *et al. Clinical Nutrition.* 2013;32:16–26.

**Disclosure of Interest:** N. Umbrain: None declared, D. Hermans Grant/Research Support from: Belgian National Health Insurance, P. Schlessers Grant/Research Support from: Belgian National Health Insurance, M. Hiele Grant/Research Support from: Belgian National Health Insurance, M. Van Winckel Grant/Research Support from: Belgian National Health Insurance, D. Ysebaert Grant/Research Support from: Belgian National Health Insurance, A. Van Gossum Grant/Research Support from: Belgian National Health Insurance.

**MON-PO441****IMPACT OF DIETARY COUNSELING ON CONTROL OF HYPERPHOSPHATEMIA AMONG HEMODIALYSIS PATIENTS**

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**Rationale:** The general objective of this study was to evaluate the impact of dietary counseling on control of hyperphosphatemia among HD patients. The specific objectives of the study were to design and implement individualized renal diet plans for HD patients, determine the effectiveness of dietary phosphorus restriction, assess the impact of the renal diet plans on anthropometric indices, laboratory indices and clinical parameters of protein energy malnutrition and hyperphosphatemia of them.

**Methods: study design:** one Pretest posttest intervention study. targeted patients: patients above 18 years, both sexes anuric attending hemodialysis unit

The study was conducted on 100 anuric HD patients with serum level >5.5 mg/dl in the past six months prior to the study. The duration of the study was 3 months. The studied patients were subjected to full history taking (medical and dietary) using pre-designed questionnaire and laboratory investigations. Also anthropometric assessment, SGA tool for HD patients were used to evaluate their nutrition status. In addition, they received standard phosphorus education and individualized meal plans at baseline and at 6 weeks after intervention. Then the effect of the intervention on dietary phosphorus restriction and serum phosphorus was evaluated 6 weeks after intervention and at the end of the study.

**Results:** Phosphorus intake of the studied patients at baseline was within the recommended level, then it was significantly decreased from  $819.0 \pm 526.5$  mg to  $791.0 \pm 529.2$  mg during the study period. On the other hand the mean inorganic phosphorus intake frequency score was high at baseline and it was significantly decreased after 6 weeks of intervention by  $60.18 \pm 21.89\%$  then it decreased non-significantly by  $47.86 \pm 42.43\%$  in comparison to baseline. A modest positive correlation between dietary protein intake and dietary phosphorus intake was found at baseline ( $r = 0.627^*$ ,  $P < 0.001^*$ ).

The mean serum phosphorus in the studied patients was  $6.62 \pm 0.90$  mg/dl at baseline and it showed weak positive correlation with dietary phosphorus intake ( $r = 0.287^*$ ,  $P = 0.004^*$ ), then it was significantly decreased to  $5.83 \pm 0.96$  mg/dl at the end of the study. The mean calcium  $\times$  phosphorus product was significantly decreased during the study period. The current study reported that there was a weak to modest positive correlation between different sources of inorganic phosphorus intake and serum phosphorus level which strength was decreased by time till it reached non-significance, except for fast food, after 3 months.

The results of the current study showed that the most potent factors which had affected serum phosphorus level as shown in the multi-linear regression model were total protein intake and inorganic phosphorus intake at 6 weeks after intervention, then at the end of the study total protein intake remained effective while inorganic phosphorus intake lost its effectiveness. At the same time, the total phosphorus intake became significantly affecting serum phosphorus level replacing inorganic phosphorus intake at the end of the study.

**Conclusions:** From this study we concluded that the effectiveness of inorganic phosphorus intake became weaker at the end of the study owing to the convenience and availability of fast food denoting that dietary choices had an important role in phosphorus homeostasis in HD patients. A significant increase in mean protein intake of the studied patients occurred which was low at baseline denoting that individual dietetic counseling may be useful in reducing phosphate load and in limiting the phosphate burden related to an adequate protein intake.

**Disclosure of Interest:** None declared.

#### MON-PO442

##### 24-WEEK, LOW GI DIET DECREASES TRUNCAL FAT MASS IN SOUTH INDIANS WITH TYPE 2 DIABETES: A RANDOMIZED STUDY

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**Rationale:** The effect of low glycemic index (LGI) diet on glycemic control in Western population has been reported, but its effect with locally available ingredients of Kerala cuisine in South Indians has not been examined previously. Hence the aim of the study was to evaluate

the effects of consuming LGI diet on glycemic control and body composition, specifically truncal and visceral adipose fat mass.

**Methods:** A randomized, 24-week intervention with LGI diet or usual diabetic diet was assigned to subjects with type 2 diabetes with HbA1c between 7 and 10%. Anthropometric measurements (BMI, TSF and waist circumference), biochemical tests like HbA1c and lipid profile (total cholesterol, triglycerides, LDL, HDL) and body fat composition (fat mass, fat free mass, truncal fat, android and gynoid fat%) were measured using DXA and assessed at baseline and after 6 months. Two sample t-test was applied for parametric test and Mann Whitney U test was applied for non-parametric.

**Results:** Thirty patients (M = 16; F = 14) with a mean age of  $52 \pm 7.7$  years (BMI  $27 \pm 4.3$  kg/m<sup>2</sup>) and having a mean duration of diabetes of  $10.6 \pm 4.56$  years completed the study. Twenty-four weeks of LGI diet (n = 15) was compared with control group (n = 15). There was a significant reduction in the study variables in the LGI group vs. control group: BMI (kg/m<sup>2</sup>) ( $26.5 \pm 5.34$  to  $25.7 \pm 4.43$  vs.  $27.5 \pm 2.90$  to  $27.6 \pm 2.91$ ;  $P = 0.013$ ); total body fat% ( $37.85 \pm 7.50$  to  $36.42 \pm 8.21$  vs.  $34.85 \pm 7.87$  to  $35.64 \pm 7.51$ ;  $P = 0.001$ ); total fat mass (kg) ( $25.0 \pm 8.78$  to  $23.6 \pm 8.04$  vs.  $25.68 \pm 8.27$  to  $26.34 \pm 8.16$ ;  $P < 0.0001$ ); truncal fat (kg) ( $14.5 \pm 4.76$  to  $13.6 \pm 4.67$  vs.  $15.19 \pm 5.4$  to  $15.62 \pm 5.13$ ;  $P = 0.001$ ). There was a significant reduction between the groups in the android fat% ( $46.77 \pm 7.14$  to  $44.57 \pm 8.20$  vs.  $44.54 \pm 7.96$  to  $45.13 \pm 7.48$ ;  $P = 0.031$ ) and gynoid fat% ( $38.88 \pm 9.72$  to  $38.30 \pm 9.97$  vs.  $35.42 \pm 9.60$  to  $36.60 \pm 9.40$ ;  $P = 0.026$ ). This decrease in fat mass was accompanied by a significant decrease in HbA1c % ( $8.12 \pm 0.9$  to  $7.16 \pm 0.72$  vs.  $8.15 \pm 1.03$  to  $8.24 \pm 1.14$ ;  $P = 0.003$ ) and total cholesterol (mg/dL) ( $175.3 \pm 39.8$  to  $157.6 \pm 34.3$  vs.  $154.8 \pm 35.5$  to  $161.7 \pm 47.5$ ;  $P = 0.05$ ). The fat-free mass did not change in the LGI group.

**Conclusions:** We concluded that a 24-week LGI diet prepared with local recipes of Kerala cuisine significantly improved the glycemic control and reduced the BMI as well as total body fat without affecting the lean mass thereby promoting a healthy weight loss.

**Disclosure of Interest:** None declared.

#### MON-PO443

##### NUTRITIONAL STATUS AND PHYSICAL QUALITY OF LIFE IN PATIENTS ABOVE THE 15 YEARS OF AGE SUFFERING FROM CYSTIC FIBROSIS.

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**Rationale:** Malnutrition caused by cystic fibrosis (CF) remains in a vicious circle mechanism, together with exacerbations of the disease, bacterial infections of lower respiratory tract, decline in respiratory efficiency and worsening of well-being. The aim of the study was to analyze the nutritional status of patients suffering from CF in relation to frequency of exacerbations of the disease, hospitalization, respiratory efficiency and well-being.

**Methods:** The study group consisted of 44 patients (20 women, 24 men) from the Medical Centers in Karpacz and Rabka. The patients' age range was between 15 and 43. The authorial questionnaire, anthropometric measurements (weight, height), spirometry and laboratory tests results served to assess the above-mentioned parameters. Statistical analyses were based on: T-student and U Mann-Whitney's tests and correlation coefficients.

**Results:** Three key conclusions were drawn from the study:

1. Impaired glucose tolerance and diabetes were associated with higher malnutrition risk ( $r = 0.488$ ,  $p < 0.001$ )
2. There was a positive correlation between well-being and ability to be physically active with nutritional status (BMI) of patients with CF ( $r = 0.421$   $p < 0.012$  and  $r = 0.433$ ,  $p < 0.009$ , respectively).
3. The respiratory efficiency (FVC%) was decreasing along with the decrease in BMI index ( $r = 0.496$ ,  $p < 0.002$ ). There was a positive

correlation between both: well-being and the possibility of making physical effort, and nutritional status (BMI) of patients with CF:  $r = 0.421$   $p < 0.012$  and  $r = 0.433$ ,  $p < 0.009$ , respectively.

**Conclusions:** In the analyzed group of patients with CF nutritional status is strongly related to respiratory efficiency, physical activity, carbohydrate metabolism and well-being. However, BMI above normal does not improve spirometry parameters.

**Disclosure of Interest:** None declared.

#### MON-PO444

##### EFFECTS OF DAILY CONSUMPTION OF YOGHURT ENRICHED WITH VITAMINS B IN COMPARISON TO PLAIN YOGHURT ON TYPE 2 DIABETIC PATIENTS: A RANDOMIZED CLINICAL TRIAL

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**Rationale:** Vitamins B exert multifunctional roles in energy metabolism while in the state of Type 2 Diabetes (T2D) the requirements may be higher. Yoghurt naturally contains vitamins of the B-complex and enrichment with other members of this vitamin class could offer additional health benefits. The study investigates the effects of consumption of yoghurt enriched with vitamins B1, B5 and B6 compared to plain yoghurt, on T2D patients.

**Methods:** Twenty-eight (N=28, men 75%, age 45–75) overweight/obese T2D patients (BMI 27–36 kg/m<sup>2</sup>) were randomized to a 12 week dietary intervention characterized by the consumption of two servings per day (2×200 g) of non-fat yoghurt either strawberry flavored enriched with vitamins B1, B5 and B6 in a minimum of 15% of the recommended dietary intakes per 100 g (VY) or isocaloric plain yoghurt (PY). Anthropometric characteristics, fasting plasma glucose and insulin, glycosylated haemoglobin (HbA<sub>1c</sub>) and basal biochemical parameters were measured. Concentrations of vitamins B and homocysteine were also determined in VY group.

**Results:** At the end of the dietary intervention body weight and BMI and were reduced in VY group ( $P = 0.04$  and  $P = 0.04$ , respectively) and there was a trend for reduction in HbA<sub>1c</sub> ( $P = 0.08$ ), while they remained unchanged in PY group compared to baseline values. In VY group, concentrations of B2 and B6 were increased ( $P = 0.04$  and  $P = 0.006$ , respectively) and there was a trend for increase in B1 levels ( $P = 0.09$ ). A trend towards reduction in homocysteine levels was also observed ( $P = 0.06$ ).

**Conclusions:** Inclusion of a non-fat yoghurt enriched with vitamins B in the daily dietary pattern facilitates body weight management, increases vitamins B concentration and ameliorates homocysteine levels of overweight/obese T2D patients.

**Disclosure of Interest:** None declared.

#### MON-PO445

##### IMPACT OF BODY MASS INDEX IN THE OCCURRENCE OF IDIOPATHIC DEEP VEIN THROMBOSIS AND IN THE QUALITY OF LIFE OF GREEK NURSES

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**Rationale:** Idiopathic deep vein thrombosis (DVT) is a common disease with high prevalence and various risk factors. The aim of the study was to investigate the role of body mass index (BMI) at the incidence of DVT in nursing staff of Greek hospitals and the effect of BMI at the quality of their life (QoL).

**Methods:** This is a multi-center descriptive correlation study, including nurses of Greek hospitals. Estimation of deep vein thrombosis was done with the clinical criteria of Hicks or by diagnosis by clinician. QoL was assessed using the SF-36 questionnaire. One-way Anova analysis was used for the statistical analysis of the data.

**Results:** The study sample consists of 3152 nurses. Totally, 896 (28.4%) subjects had normal weight, 2143 (68%) were overweight and 113 (3.6%) were obese. Obese patients rather than normal and overweight patients have lower level of exercise ( $4.5 \pm 0.8$  vs.  $3.4 \pm 1.1$  vs.  $3.8 \pm 0.9$ ,  $p < 0.001$ ), increased rate of diagnosis of DVT by physician (45.1% vs. 2.7% vs. 9.2%,  $p < 0.001$ ) and 3 or more criteria of DVT (60.2% vs. 14.1% vs. 25.3%,  $p < 0.001$ ), and lower score of physical function ( $35.7 \pm 38.8$  vs.  $85.1 \pm 28.6$  vs.  $74.1 \pm 35.3$ ,  $p < 0.001$ ), role limitations due to physical health ( $38.9 \pm 42.4$  vs.  $84.9 \pm 31.4$  vs.  $73.6 \pm 36.9$ ,  $p < 0.001$ ), role limitations due to emotional problems ( $38.1 \pm 41.8$  vs.  $83.1 \pm 33.3$  vs.  $72.5 \pm 38.5$ ,  $p < 0.001$ ), energy/fatigue ( $44.7 \pm 22.1$  vs.  $57.9 \pm 19.8$  vs.  $57.1 \pm 20.2$ ,  $p < 0.001$ ), emotional well-being ( $53.6 \pm 18.1$  vs.  $66.4 \pm 18.9$  vs.  $66.1 \pm 17.9$ ,  $p < 0.001$ ), social functioning ( $52.4 \pm 37.2$  vs.  $87.7 \pm 22.5$  vs.  $80.6 \pm 31.1$ ,  $p < 0.001$ ), pain ( $39.8 \pm 39.2$  vs.  $82.6 \pm 29.1$  vs.  $74.7 \pm 36.4$ ,  $p < 0.001$ ) and general health ( $42.9 \pm 22.9$  vs.  $65.7 \pm 16.8$  vs.  $60.4 \pm 19.1$ ,  $p < 0.001$ ). The advanced BMI was found to be prognostic factor for DVT ( $\beta = -0.323$ , OR = 1.381, 95% CI: 1.302–1.464).

**Conclusions:** Increased BMI is a risk factor for DVT in nurses and negatively affects their QoL.

**Disclosure of Interest:** None declared.

#### MON-PO446

##### A PRELIMINARY QUALITATIVE STUDY OF GENERAL PRACTITIONERS' VIEWS ON MALNUTRITION MANAGEMENT AND ORAL NUTRITIONAL SUPPLEMENTATION PRESCRIPTION IN THE COMMUNITY

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**Rationale:** Oral nutritional supplements (ONS) are effective in managing malnutrition when prescribed for the right patients. Previous research indicates that inappropriate prescribing of ONS occurs frequently in the community. Previous Irish research has demonstrated low awareness of malnutrition and its management among non-dietetic health care professionals. In Ireland, general practitioners (GPs) are the main prescribers of ONS in primary care. On many occasions GPs are the first point of contact for individuals in the community at risk of malnutrition. GPs' views can provide insight into the complexities of managing malnutrition and ONS prescribing in the community.

**Methods:** Semi-structured interviews with nine GPs. Domains explored; Barriers and facilitators managing malnutrition and ONS prescribing. Data was transcribed and analysed using inductive thematic analysis.



**Results:** Preliminary themes identified; i) Malnutrition a secondary concern ii) Resources and support for managing malnutrition are needed iii) Reluctance to prescribe ONS.

**Conclusions:** GPs reported not screening for malnutrition, but viewed it as a consequence of other conditions and social factors. GPs expressed that they should not have sole responsibility for malnutrition management and more dietitians and trained community nurses would be desirable to support them. A preference to avoid supplementation and implement dietary changes first was expressed by GPs. GPs thought that they should receive further independent training on the different ONS available in the market as currently they did not feel confident prescribing a range of them. Awareness of ONS cost and its misuse by certain patients were reported as reasons that made GPs reluctant to prescribe them, potentially leading to under prescribing.

**Disclosure of Interest:** None declared.

#### MON-PO447

##### A PRELIMINARY QUALITATIVE STUDY OF NURSES' AND DIETITIANS' VIEWS ON MALNUTRITION MANAGEMENT AND ORAL NUTRITIONAL SUPPLEMENTATION PRESCRIPTION IN THE COMMUNITY.

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**Rationale:** Malnutrition occurs in developed countries both in hospitalized patients and in the community setting. Oral nutritional supplements (ONS) are effective managing malnutrition when prescribed for the right patients. Previous Irish research has demonstrated low awareness of malnutrition and its management among non-dietetic health care professionals. This qualitative study aims to explore nurses' and dietitians' views on the management of malnutrition and the prescription of ONS in the community in Ireland.

**Methods:** Four focus groups were conducted, three with dietitians (n = 17) and one with nurses (n = 5). Domains explored; the term malnutrition, barriers and facilitators in the management of malnutrition and ONS prescribing in the community. Data was transcribed and analysed using inductive thematic analysis.

**Results:** Both professional groups showed similar perspectives, and three preliminary main themes were identified; i) Malnutrition is a misunderstood term, ii) Delayed treatment of malnutrition, iii) Challenges with ONS prescription.

**Conclusions:** Both professionals agreed that the term malnutrition had negative connotations for patients. Dietitians identified the need for a multidisciplinary approach to manage malnutrition in the community, and nurses agreed on their pivotal role identifying the risk of malnutrition and providing first line advice. However, nurses expressed the urgent need for training to provide first line advice to patients to improve their nutritional status to prevent malnutrition. Both groups also agreed on the need for access to more dietitians in the community, and suggested that giving dietitians prescribing rights would improve appropriate ONS prescribing. Community nurses identified the need to receive independent generic education on nutritional supplements.

**Disclosure of Interest:** None declared.

#### MON-PO448

##### BONE MINERAL DENSITY STATUS AND EVOLUTION IN SEVERELY MALNOURISHED ADULT PATIENTS WITH ANOREXIA NERVOSA

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**Rationale:** Anorexia nervosa (AN) is a psychiatric disorder with potentially serious somatic consequences and high rate of mortality. Reduced bone mineral density (BMD) is the most frequent chronic complication. We aimed to study the prevalence of low BMD (Z-score  $\leq -2$  SD) and fractures in severely malnourished inpatients with AN and to describe their evolution during nutritional care.

**Methods:** We conducted a retrospective study including all consecutive AN patients hospitalized in Nutritional Care Unit of Raymond Poincare University Hospital over 2 years. Clinical and biological data were collected. BMD was evaluated by dual energy X-ray absorptiometry.

**Results:** One hundred and one patients were included (97 F/4 M), age  $30.7 \pm 12.1$ , BMI  $12.6 \pm 1.6$ , 68% of patients had a restrictive type (DSM IVr). At baseline, mean values of lumbar spine BMD Z-score was  $-2.2 \pm 1.2$  SD and of femoral neck was  $-1.9 \pm 0.86$  SD. The prevalence of Z-score  $\leq -2$  SD for the lumbar spine was 51% and 38% for the femoral neck ( $p < 0.01$ ). The prevalence of fractures was about 9.1%. Associations of low BMD and BMI, restrictive type, onset of disease and amenorrhea were found ( $p < 0.01$ ,  $p < 0.05$ ,  $p < 0.01$ ,  $p < 0.001$ ). After 3 years mean evolution, the mean of BMD increased in 36% of patients ( $p = 0.007$ ) in association with improvement of their weight about  $11 \pm 10.5$  kg ( $p = 0.04$ ) and vitamin D status ( $p = 0.002$ ).

**Conclusions:** AN is associated with a high risk of low BMD and low kinetics fractures at very young age. Improvement of BMD was associated with weight gain. Further studies are needed to assess the management of bone disease in patients with AN.

**Disclosure of Interest:** None declared.

#### MON-PO449

##### PREDICTIVE FACTORS AT TIME OF DIAGNOSIS FOR GASTROSTOMY AND IMPACT ON SURVIVAL IN PATIENTS WITH AMYOTROPHIC LATERAL SCLEROSIS

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**Rationale:** A gastrostomy is recommended in ALS patients when the weight loss is over 10% as compared to usual weight, repeated aspirations, a meal time duration more than 45 minutes. The impact of gastrostomy on survival of ALS patients is still debated. The objectives of our work were: i) to search at diagnosis, factors associated with the indication of gastrostomy ii) to evaluate survival of ALS patients with gastrostomy indication's according to their acceptance of the feeding tube placement.

**Methods:** ALS patients were followed in the referral ALS centre between 2006 and 2017 and had from diagnosis to death prospective evaluations of their neurological (onset form, ALS functional rating scale revised, bulbar functional scale), nutritional (weight, percentage of weight loss according to usual weight, body mass index and body

composition by bioelectrical impedancemetry analysis) and respiratory status (forced vital capacity). Statistical analysis was done by using Mann-Whitney test, Chi<sup>2</sup> tests, Cox model and multivariate logistic regression.

**Results:** Two hundred and eighty-five patients were included. Among the 63.9% for whom gastrostomy was indicated, 63.7% had accepted the placement. The median delays diagnosis-indication and indication-placement were 7.3 months [3.2–15.0] and 2.7 months [0.9–5.8], respectively. At diagnosis, bulbar onset, a loss of one point of body mass index and of bulbar functional scale were positively associated with indication of gastrostomy (aOR=10.0; p=0.002, aOR=1.17; p=0.025 and aOR=1.19; p=0.002, respectively). Weight loss > 5% significantly increased the risk of death by 17% (p<0.0001). However, gastrostomy placement did not have impact on the survival (aHR=1.25; p=0.22).

**Conclusions:** Neurological and nutritional criteria were associated with an indication of gastrostomy. The gastrostomy placement had no impact on survival. The study of an earlier placement of gastrostomy and on the impact of the level of enteral nutrition associated might be of interest in further prospective studies.

**Disclosure of Interest:** None declared.

#### MON-PO450

##### BODY COMPOSITION OF PATIENTS WITH PULMONARY TUBERCULOSIS (TB), ATTENDING DISTRICT CHEST CLINICS (DCC) OF COLOMBO AND GAMPAHA DISTRICTS.

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**Rationale:** TB on its own is associated with wasting, loss of weight and fat free mass (FFM) and this may be a major contributing factor to increased mortality in these individuals. Published data on body composition analysis of pulmonary TB is very limited worldwide including Sri Lanka

To investigate the usefulness of body composition of pulmonary TB patients for specific treatment.

**Methods:** A cross sectional study was carried out including 195 pulmonary TB patients attending DCC, in central and one regional clinic. All new recruits in these clinics were enrolled for the study during 3 months period. Anthropometry and body composition analysis was done.

**Results:** There were 77.9% males and 22.1% females, with mean age of 49.6±13.9 and 42.6±18.7 years respectively. 41.4% males and 48.8% females were underweight (<18.5 of BMI). Males were having 20.0% and 5.1% of total fat mass and visceral fat mass respectively, whereas females were having 21.6% and 5.0%. Males had skeletal muscle mass of 23.9±4.2 kg and females had 24.3±3.6 kg. Underweight males had 12% and 83.2% of fat mass and muscle mass respectively whereas females had 17% and 80.9%. Underweight males had visceral fat level of 2% and females had 1.5%.

**Conclusions:** Half of pulmonary TB patients were underweight. Females were having low total fat mass and males were within normal limits. Fat mass is affected than muscle mass in underweight patients.

**Disclosure of Interest:** None declared.

#### MON-PO451

##### INTERACTION BETWEEN MAGNESIUM INTAKE-ASSOCIATED CARDIAC BENEFITS AND POTASSIUM INTAKE IN CHRONIC HEART FAILURE

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**Rationale:** Magnesium serves as a cofactor in more than 300 enzymatic reactions and plays a key role in the body's anti-oxidative mechanisms. High magnesium intake has been associated with better prognosis in patients with heart failure (1). However, this beneficial effect is quite variable, suggesting other factors may interact with the positive effect of high magnesium intake (2). Therefore, we sought to determine if potassium intake (an important ion in cardiac function) could interact with the beneficial effects of magnesium in patients with heart failure (HF).

**Methods:** Patients were prospectively enrolled in this cross-sectional study. We included patients with stable chronic HF and reduced left ventricular ejection fraction (LVEF). The evaluation of dietary magnesium and potassium intake was obtained through a food processor nutrition analysis software. NT-proBNP (main biomarker in heart failure hence higher levels imply poor prognosis) was measured to assess severity of HF. Dietary evaluation and NT-proBNP measurements were done the same day. Multivariable linear regression and partial correlations were used to assess association between magnesium and NT-proBNP.

**Results:** We included 60 patients (age 60±14 years, male 78%). Only 31% of participants consumed the recommended magnesium daily intake. In the whole population, magnesium intake showed a modest correlation with NT-proBNP (rho -0.30, p=0.020). However, after comprehensive multivariable regression, a strong interaction was noted between potassium and magnesium intake. The beneficial effect of magnesium intake on NT-proBNP occurred only in patients with low potassium intake (partial correlation -0.57, p=0.002), whereas magnesium intake was not correlated with NT-proBNP when potassium intake was high (partial correlation 0.02, p=0.938;  $p_{interaction}=0.048$ ).

**Conclusions:** In patients with stable chronic heart failure and reduced LVEF, high magnesium intake was associated with beneficial cardiac effects only when potassium intake was low. Higher potassium intake led to no cardiac benefits with high magnesium intake.

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**Disclosure of Interest:** None declared.

### MON-PO452 ASSOCIATION BETWEEN PYRIDOXINE AND NIACIN WITH NATRIURETIC PEPTIDE IN PATIENTS WITH HEART FAILURE

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**Rationale:** Heart failure (HF) is a pandemic disease with poor prognosis. Amino-terminal pro-brain natriuretic peptide (NT-proBNP) is associated with severity of HF and is a strong predictor of mortality (1). Pyridoxal 5'-phosphate (PLP), nicotinamide adenine dinucleotide oxidized (NAD) and reduced (NADP) are the metabolically active forms of pyridoxine and niacin, respectively. These micronutrients play key roles as cofactors in energy-producing pathways; thus, potentially contributing to the progression of HF (2). However, their role with the severity of HF is unclear. Therefore, we sought to assess the association between these micronutrients and NT-proBNP

**Methods:** Cross-sectional study. We included patients with stable chronic HF and reduced left ventricular ejection fraction (LVEF). The evaluation of dietary intake was obtained through a 24-hour dietary recall. NT-proBNP was measured with a standardized technique. Both were performed the same day. Simple and multivariable linear stepwise backward regression analysis were used to assess association between these micronutrients and NT-proBNP.

**Results:** We included 61 patients (age 60 ± 14 years, male 79%, LVEF 30 ± 7%). Median NT-proBNP was 940 pg/mL (interquartile range 376–2666). Dietary intake of niacin was 22.9 mg ± 14.9, and pyridoxine 1.2 mg ± 0.6, respectively. Niacin and pyridoxine showed negative correlations with NT-proBNP ( $p = 0.031$ ;  $p = 0.012$ ; respectively). After comprehensive adjustment for covariates, only hypertension, LVEF, and niacin were independently associated with NT-proBNP. Pyridoxine was also independently associated with NT-proBNP in a similar model.

**Conclusions:** Dietary intake of pyridoxine and niacin were independently associated with NT-proBNP. This suggests that these micronutrients could potentially affect the severity of HF.

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**Disclosure of Interest:** None declared.

### MON-PO453 EVALUATION OF DAILY NUTRITION AND RISK OF IRON DEFICIENCY IN INFLAMMATORY BOWEL DISEASE

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**Rationale:** Anemia is the most common complication of inflammatory bowel disease (IBD). Iron deficiency, precedes the development of anemia, can be one of the first manifestations of undernutrition. Maldigestion and malabsorption associated with disease activity (hypermetabolism), location of lesions, fear of eating and using irrational diets significantly affect the risk of undernutrition and the need for nutritional support in IBD patients.

**Methods:** Assessing how the composition of the diet used by IBD patients affects the incidence and extent of latent iron deficiency and anemia.

42 patients with Crohn's disease (CD; 11 women, 31 men) and 34 patients with ulcerative colitis (UC; 13 women, 21 men) underwent assessment of daily nutrition at the time of admission to the gastroenterology ward. Data on food intake were collected using the nutritional diary (information from the 3 days preceding hospitalization).

All patient underwent blood investigation comprising hemoglobin (HGB), ferritin, transferrin and serum iron. Anemia defined as a HGB level of less than 12.0 g/dl in females and less than 13.0 g/dl in males has been established in 10 patients with CD (24%) and 13 patients with UC (38%).

**Results:** 59% patients had impaired iron homeostasis: 23 patients had anemia (10 CD; 13 UC), and 22 iron deficiency (12 CD; 10 UC). The occurrence of anemia was significantly statistically related to the number of exacerbations of the IBD in the last year ( $p = 0.0454$ ). There was no relationship between the duration of the disease, the type of treatment used and the stage of the disease to iron deficiency and anemia.

47 patients (62% of the patients) had a correct BMI (25 CD; 22 UC). 50 patients (CD 22, UC 28) declared compliance with dietary recommendations related to the disease. The average iron supply was 13.7 mg (SD ± 4.9 mg) for the whole group. Women supplied 12.5 mg (SD ± 4.7 mg) of iron with food, while men supplied 14.2 mg (SD ± 5.0 mg). Patients with CD consumed less in this microelement (12.6 mg; SD ± 4.4 mg), compared with patients with UC (15.0 mg; SD ± 5.3 mg). It was shown that statistically significantly lower supply of iron in the diet occurred in women ( $p = 0.0109$  – both types of IBD) and patients with ulcerative colitis ( $p > 0.0001$ ).

The disease statistically significantly affects the introduction of dietary restrictions to the daily diet in UC patients ( $p = 0.0062$ ). The diet used by IBD patients showed a statistically significant effect on the occurrence of iron deficiency ( $p = 0.0341$ ) but not anemia ( $p = 0.1311$ ).

**Conclusions:** It has been shown that in addition to activity of inflammatory bowel disease, the diet is also important in the development of the iron deficiency and anemia. Based on the study conducted, special attention should be paid to prevention in women and patients with ulcerative colitis. A properly balanced diet may be an important element that reduces the risk of developing the most common parenteral manifestations of IBD = anemia.

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**Disclosure of Interest:** None declared.

### MON-PO454 HOME NUTRITIONAL THERAPY AND FOOD INSECURITY

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**Rationale:** Food Insecurity (FI) in Home Enteral Nutrition (HEN) occurs when the Human Right to Adequate Food Intake is disrespected. Thus, the aim of this study was to verify the correlation between nutritional formulae categories and FI in households of patients in HEN, beneficiaries of the Programme of Nutritional Attention to People with Special Feeding Needs (PAN).

**Methods:** A cross-sectional observational study within the households of PAN patients over 18 years old was performed. Data was collected between December 2015 and June 2018 in Curitiba/PR, Brazil. Nutritional formulae were categorized as commercial, with food and mixed (food + supplement). FI was evaluated by short-form version of the Brazilian Scale of Food Insecurity (EBIA). Statistical analysis was carried out by means of chi-squared test, with level of significance of 5%.

**Results:** 130 HEN patients were included (mean age:  $64.6 \pm 20.8$  years), being 51.5% ( $n = 67$ ) men, 72.3% ( $n = 94$ ) with nervous system diseases and 20.8% ( $n = 27$ ) with cancer. The most frequent nutritional formula category was mixed (53.1%,  $n = 69$ ), followed by commercial (34.6%,  $n = 45$ ) and with food (12.3%,  $n = 16$ ). FI was observed in 50.0% ( $n = 65$ ) of households. Nutritional formula category and diagnose did not associate to FI ( $p = 0.163$  and  $p = 0.492$ , respectively). Households with male HEN patients presented higher FI frequency in comparison to households with female HEN patients (66.1% e 33.8%, respectively,  $p = 0.001$ ). Male patients received mixed formula more frequently compared to female patients, that received commercial formula more frequently ( $p = 0.002$ ).

**Conclusions:** Nutritional formula category could not be linked to FI in households of HEN patients' beneficiaries of PAN, but being male and receiving mixed nutritional formula can influence presence of FI.

**Disclosure of Interest:** None declared.

#### MON-PO455

##### A COMPLETE LINKAGE DISEQUILIBRIUM IN A HAPLOTYPE OF THREE SNPS IN FAT MASS AND OBESITY ASSOCIATED (FTO) GENE WAS STRONGLY ASSOCIATED WITH ANTHROPOMETRIC INDICES AFTER CONTROLLING FOR CALORIE INTAKE AND PHYSICAL ACTIVITY

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**Rationale:** The underlying mechanism of the effect of FTO genotype on body mass index (BMI) and body composition is unknown. The objective of the study was to investigate the association of FTO gene polymorphisms with anthropometric indices in adolescent boys after adjustments for dietary intake and physical activity.

The underlying mechanism of the effect of FTO genotype on body mass index (BMI) and body composition is unknown.

**Methods:** In this school-based study, we enrolled 123 male adolescents without extra weight and 110 adolescents with BMI higher than +1 Z-score. The DNA samples were genotyped for the FTO gene polymorphisms by DNA Sequencing. BMI and body composition were assessed using BIA scale. Association of the FTO polymorphisms with Weight, height, BMI, body fat percent and skeletal muscle percent were investigated.

**Results:** Adolescents with higher BMI and body fat percent and lower skeletal muscle percent were more likely to have a newly found haplotype of rs9930506, rs9930501 & rs9932754 (GGT) in the first intron of the FTO with complete linkage disequilibrium (LD) compared with those with the lower BMI (6.15; 2.28–16.63), body fat percent (9.54; 0.92–47.44) and higher skeletal muscle percent (9.26; 1.85–46.38).

**Conclusions:** haplotype in the first intron of the FTO gene had a strong association with obesity indices in adolescent boys after adjustments

for calorie intake and physical activity. It's suggested that the FTO genotype exert its effects on adolescents' anthropometric indices as haplotype and through mechanisms other than changes in calorie intake and expenditure.

**References:** Haplotype in the first intron of the FTO gene had a strong association with obesity indices in adolescent boys after adjustments for calorie intake and physical activity. It's suggested that the FTO genotype exert its effects on adolescents' anthropometric indices as haplotype and through mechanisms other than changes in calorie intake and expenditure.

**Disclosure of Interest:** None declared.

#### MON-PO456

##### INVESTIGATION OF EXERCISE AND ACTIVITY LEVELS AMONG PATIENTS ON HOME PARENTERAL NUTRITION WITHIN THE REGIONAL INTESTINAL FAILURE SERVICE NORTHERN IRELAND.

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**Rationale:** The aim of this investigation is to determine whether home parenteral nutrition (HPN) treatment effects exercise and activity levels in patients. Intestinal failure is a 'reduction in the functioning gut mass below the minimal amount necessary for adequate digestion and absorption of food'. Parenteral nutrition refers to the provision of nutrients by the intravenous route and is a form of artificial nutrition for intestinal failure (IF) patients. Over the past decades, considerable knowledge has accumulated for the significance of exercise in the treatment of a number of diseases.<sup>1</sup> Exercise is indicated in the treatment of a large number of medical disorders.<sup>2,3</sup>

**Methods:** A survey of 17 patients on HPN; participants aged between 17–84; 7 male, 10 female. A survey was devised by creating a list of questions and distributed by post to all HPN outpatients within the Regional Intestinal Failure Service, Northern Ireland. The survey was compiled of multiple choice and short answer questions, using language that is appropriate and easy to read so that the patients could understand. All relevant data for the current analysis were collected from the survey.

**Results:** Since starting HPN 76% of respondents have been able to exercise although these activities may not have been as high impact as before starting HPN. There is a correlation in the hours and nights infused per week and the frequency and duration of exercise. As the hours and nights of infusion increased the frequency and duration of exercise decreases. The most common barriers to exercise were discomfort and pain and illness/fatigue.

**Conclusions:** These results support the hypothesis that HPN can have a negative effect on exercise and activity levels in patients but it is not the only contributing factor.

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**Disclosure of Interest:** None declared.

### MON-PO457 UNDERLYING CAUSES OF VITAMIN K DEFICIENCY IN PATIENTS TREATED WITH HEMODIALYSIS

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**Rationale:** A low vitamin K status is common in patients in hemodialysis, and this is considered one of the reasons for the accelerated atherosclerosis in these patients. The vitamin is essential in activation of the protein MGP, and the inactive form, dp-ucMGP is used to measure vitamin K status. The reason for the low vitamin K status in these patients is not known. The purpose of the study was to investigate possible underlying causes, which potentially can be low intake, washout during dialysis or inhibited absorption capacity. Moreover, the aim was to assess if the biomarker dp-ucMGP is affected in plasma and dialysate.

**Methods:** Vitamin K intake was assessed by FFQ (n = 16) and absorption capacity by D-xylose-test (n = 7). P-dp-ucMGP was measured before and after dialysis, and phylloquinone and dp-ucMGP was measured in the dialysate. Differences in p-dp-ucMGP were measured after 14 days of protein supplementation (n = 16).

**Results:** All patients had p-dp-ucMGP above 750 pmol/L. 63% of the women and 45% of the men met the recommended intake for vitamin K, with a median of 1856 pmol/L. Difference in p-dp-ucMGP before and after dialysis was -1022 pmol/L (p < 0,0001). Vitamin K (phylloquinone) was not present in the dialysate, but dp-ucMGP was measured in high concentration. The difference in p-dp-ucMGP before and after protein supplementation was -165 pmol/L (-1690-373) (p = 0,06). D-xylose tests were normal.

**Conclusions:** P-dp-ucMGP was increased in all patients meaning vitamin K deficiency. The reason for the low vitamin K status is probably not removal of phylloquinone during dialysis or decreased absorption, but is probably due to low intake of vitamin K. The dp-ucMGP is washed out during dialysis and thereby markedly affected. The level of p-dp-ucMGP is not affected by protein intake.

**Disclosure of Interest:** None declared.

### MON-PO458 A CROSS-OVER TRIAL OF THE EFFECTS OF DIET RICH IN VITAMIN K AND VITAMIN K SUPPLEMENTATION IN TABLETS IN PATIENTS WITH VITAMIN K DEFICIENCY IN HEMODIALYSIS. AND THE EFFECT OF BOILING ON THE CONTENT OF VITAMIN K IN BROCCOLI

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**Rationale:** A low vitamin K status is common in patients in hemodialysis. Because of potassium and phosphate restrictions in their diet the amount of vitamin K-rich foods are often limited to a minimum. The purpose was to investigate if a diet rich in vitamin K or a

supplement with vitamin K could improve the vitamin K status in these patients.

In addition it was examined if boiling of broccoli affected the potassium and phylloquinone ratio.

**Methods:** 10 patients participated (9 completed both periods) in a 15 weeks long crossover study consisting of two 6-weeks interventions interrupted by a three-weeks wash-out period. The diet-intervention focused on a diet rich in menaquinones and phylloquinones and the tablet intervention (MK-7) consisted of a daily supplement with 360 µg. P-dp-ucMGP (biomarker of vitamin K status) was measured before, after 3 weeks and after 6 weeks of intervention. Vitamin D (p-25-OH-Vitamin D) and coagulations factors (INR) was measured as well.

Broccoli was boiled for 2 and 8 minutes. Phylloquinone and potassium concentrations were measured before and after.

**Results:** P-dp-ucMGP differences in the diet-intervention were 26 pmol/L (-1335-2205) (p = 1) and -417pmol/L (-1257-44) (p = 0,007) in the MK-7-intervention. P-25-OH-Vitamin D differences in the diet-intervention were -6 nmol/L (-38-46) (p = 0,374) and -16 nmol/L (-61-154) (p = 0,066) in the MK-7-intervention. INR differences were 0 (-0,1-0,0) (p = 0,083) in the diet-intervention and 0 (-0,1-0,0) (p = 1) in the MK-7-intervention.

After 2 min of boiling, the potassium content was reduced by 24% (±1) and phylloquinone content by 8% (±8). After 8 min of boiling, potassium was reduced by 51% (±3) and phylloquinone 7% (±3).

**Conclusions:** MK-7-supplementation lowered p-dp-ucMGP significantly more than menaquinone and phylloquinone focused diet, meaning that the MK-7 supplementation was much more effective. However, the compliance to the diet wasn't good. Vitamin D status was decreased in-significantly during the MK-7-intervention and should be investigated further.

Boiling broccoli decreases the potassium concentration and retains phylloquinone concentrations. This could be of importance in dietary guidance.

**Disclosure of Interest:** None declared.

### MON-PO459 SUPERIOR MESENTERIC ARTERY SYNDROME IMPROVED BY ENTERAL NUTRITIONAL THERAPY: A RETROSPECTIVE STUDY IN A SINGLE INSTITUTION

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**Rationale:** Background Superior mesenteric artery syndrome (SMAS) is a relatively rare cause of chronic duodenal obstruction, owing to the compression of the third portion of the duodenum. This retrospective study aims to discuss the efficacy of enteral nutrition in nutritional status and symptom improvement at a short-term follow-up for SMAS patients.

**Methods:** We retrospectively analyzed the clinical data of patients who are diagnosed with SMAS and treated with enteral nutrition from September 2012 to January 2019.

**Results:** Twenty-six patients were included. The mean age was 24.96 ± 11.77 years; 16 of which were women, accounting for 61.5%. The mean body weight was 40.94 ± 10.16 kg, the mean weight loss was 11.73 ± 7.58 kg, and the mean BMI was 14.82 ± 2.52. The mean duration of EN therapy was 10.10 ± 4.66 months. Two types of enteral nutrition routes were used in these patients, including 14 cases of percutaneous endoscopic gastrostomy with jejunal extension tube (PEG-J) and 12 cases of nasal jejunum tube (NJ). The serum level of hemoglobin, albumin, pre-albumin, transferrin, RBP and IGF-1 increased significantly (p < 0.05) after enteral nutrition therapy, and BMI and body weight also notably increased. Through a median follow-up of 24 months (9-44) after EN therapy, the mean symptom score remarkably

decreased from  $24.28 \pm 9.57$  to  $8.06 \pm 8.29$  ( $p < 0.0001$ ). The clinical outcomes based on the patients' satisfaction with the treatment showed that 65% of patients' symptoms were resolved (13/20) and 15% of patients' symptoms were improved (3/20). A total of 16 complications occurred, including tube blockage (5/16), peristomal wound infections (5/16), peristomal leakage (5/16), granulomas (5/16), and nasopharyngeal pain (5/16).

**Conclusions:** Enteral nutrition therapy was proved to be an effective and safe treatment option for SMAS patients. Moreover, even if it cannot completely improve symptoms, it can improve the nutritional status for subsequent treatment.

**Disclosure of Interest:** None declared.

#### MON-PO460

##### ACUTE EFFECTS OF DIET IN OLDER ADULTS WITH A RISK PHENOTYPE FOR NEURODEGENERATIVE DISEASES USING NEUROFILAMENT LIGHT: A PROOF OF CONCEPT

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**Rationale:** Neurofilament light (NfL) is a scaffolding protein that is exclusively expressed in neurons and released into the cerebrospinal fluid and at lower concentrations into the bloodstream upon neurodegeneration. The aim was to investigate the effects of meals representing two different dietary patterns on neuronal response by analyzing the neuroaxonal injury marker NfL in serum.

**Methods:** In a randomized crossover trial, each participant consumed two iso-energetic (4300 kJ) meals, a Western diet high carbohydrate and a Mediterranean diet meal (rich in oleic acid, n-3-fatty acids, dietary fiber and antioxidants). Blood samples were collected at fasting and 1.0, 2.0, 4.0 h postprandially. Serum NfL concentrations were analyzed in 44 participants (25 male; range 60–80 y) with metabolic syndrome traits using an ultrasensitive single molecule array method (Simoa, Quanterix). Statistical analyses included correlation analyses and linear mixed models with age and baseline concentration as covariates.

**Results:** Postprandial serum NfL concentrations decreased to a minimum NfL level after 2 h (–13.5%, –14.6% respectively,  $P < 0.001$ ) independent of meal composition. Furthermore baseline serum NfL concentrations ( $15.9 \pm 6.0$  pg/ml) were positively correlated with age (mean age  $69 \pm 5$  years;  $r = 0.57$ ,  $P < 0.001$ ) and no gender specific differences were found in baseline concentrations or postprandial responses.

**Conclusions:** Preliminary results showed a postprandial effect on serum NfL concentrations independent of meal composition. As expected the elevated baseline analyte levels observed in older participants were correlated with age, which might be related to neuronal degeneration. This assumption needs to be confirmed in further studies.

**Disclosure of Interest:** None declared.

#### MON-PO461

##### COMORBID ANXIETY AND DEPRESSION IN INTESTINAL FAILURE AND COLORECTAL PATIENTS

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**Rationale:** Significant comorbid anxiety and depression amongst Intestinal Failure (IF) patients have often been observed by our team, but we had never formally assessed this. Input from Health Psychology/ Liaison Psychiatry services is not currently routine for IF patients at our hospital. We therefore conducted a service review to identify the level of unmet need.

**Methods:** We asked patients with Type 2 IF (defined as requiring parenteral nutrition for at least 28 days<sup>1</sup>) to complete a Hospital Anxiety and Depression Scale (HADS). We also extended this to Colorectal patients not requiring parenteral nutrition for any length of time.

The HADS is a well-validated tool used to identify cases of anxiety disorders and depression and assess symptom severity.<sup>2</sup> It is a self-rating questionnaire, which generates a sub-score for both anxiety and depression and classifies a score of 0–7 as normal, 8–10 as a 'borderline case' and 11–21 as a 'case'.

**Results:** The mean anxiety and depression scores for IF patients were 9.8 and 9.1, compared with 6.5 and 5.8 for Colorectal patients. This represents a statistically significant difference in symptomatology scoring between the groups ( $p = 0.0192$  and  $p = 0.0051$  respectively). Both groups scored higher than the reported UK population averages of 5–6 for anxiety and 3 for depression.<sup>3</sup>

There were 11 cases and 6 borderline cases of anxiety disorders in the IF group (28 patients), versus 7 cases and 6 borderline cases amongst the Colorectal group (30 patients). For depression, there were 11 cases and 3 borderline cases amongst the IF group, versus 6 cases and 5 borderline cases amongst the Colorectal group.

11 of the 18 IF patients with abnormal scores had never accessed any kind of professional mental health support.

**Conclusions:** These results confirm that anxiety and depression are a particular problem amongst IF patients, although it should be noted that a substantial number of Colorectal patients were also classified as anxious or depressed. We are changing our practice to offer better psychological support.

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**Disclosure of Interest:** None declared.

#### MON-PO462

##### INTRAVENOUS LIPID EMULSIONS AND LIVER FUNCTION IN ADULT CHRONIC INTESTINAL FAILURE PATIENTS: POST-HOC RESULTS FROM A RANDOMIZED CLINICAL TRIAL

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**Rationale:** Intravenous lipid emulsion (ILE) is an essential component of parenteral nutrition (PN), but also one of the key risk factors for development of intestinal failure associated liver disease (IFALD). The direct comparison of ILE during long-term PN has only been performed once and for the time period of 12 months. The aim of



the study was to analyse the influence of ILEs on liver function during PN administered for more than two years.

**Methods:** A randomized, controlled clinical trial was performed at the Intestinal Failure Center in Skawina, Poland. Fifty-one patients (30 F, 21 M, mean age 53.9 years) enrolled to home parenteral nutrition (HPN) due to stable chronic intestinal failure (CIF), were randomized to receive one the following ILEs for 12 months and then continued observation for next 4 years: medium/long-chain triglycerides (MCT/LCT), olive oil/LCT (OO/LCT) and a mix of LCT/MCT/OO/fish oil (SMOF). Liver function was assessed clinically and with biochemical parameters (total bilirubin, SGOT, SGTP, GGPT, alkaline phosphatase) every 6 months.

**Results:** 41 of 51 patients finished 5-year study period. The most common reason for intestinal failure (IF) was short bowel due to mesenteric ischaemia, followed by Crohn's disease, surgical complications and radiation enteritis. No signs of essential fatty acids deficiency were diagnosed. All three ILEs demonstrated comparable influence on liver in all study periods regarding bilirubin concentration (study entry: OO/LCT: 18.0 (11.6–33.7), MCT/LCT 9.4 (5.9–16.0), SMOF 9.4 (7.6–12.3); study termination: 15.1±5.5, 12.2±8.7 and 11.1±9.7, respectively,  $p < 0.05$ ) as well as GGTP, SGOT, SGPT and alkaline phosphatase.

**Conclusions:** All ILEs of second and third generation can be used in long term parenteral nutrition without increasing the risk of complications.

**Disclosure of Interest:** None declared.

#### MON-PO463

##### RARE COMPLICATIONS OF HOME PARENTERAL NUTRITION (HPN)

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**Rationale:** Long term complications of home parenteral nutrition (HPN) can be divided according to their incidence into relatively frequent, such as central line catheter related bloodstream infection (CR-BSI) and rare, such as intestinal failure related liver disease (IFALD). Both of those may be life-threatening and can significantly deteriorate the quality of life. The aim of the study was to analyze to incidence of rare complications and their impact on clinical course.

**Methods:** A retrospective analysis of 582 patients (310 F, 272 M, mean age 56.7) receiving HPN between December 1999 and December 2018 at the Intestinal Failure center in Skawina. All patients received complex home care including wide-ranging medical supervision and home PN delivery. All patients or their caregivers were trained at hospital settings for at least 10 days before the onset of HPN.

**Results:** During analyzed period CRBSI's ratio reached 0.42 episode/1000 CVC days. Rare complications were observed in 24 patients (4.1%). The most frequent was upper venous system thrombosis ( $n = 7$ ), followed by renal failure ( $n = 3$ ), mechanical damage of central venous catheter ( $n = 3$ ), endocarditis ( $n = 3$ ), metabolic bone disease with pathologic fractures ( $n = 2$ ), IFALD ( $n = 2$ ), intracerebral abscess ( $n = 1$ ), respiratory failure ( $n = 1$ ), severe pancreatitis ( $n = 1$ ), fungal retinitis ( $n = 1$ ). 7 of 24 (29.1%) patients with rare complications died.

**Conclusions:** The reduction of the incidence of frequent HPN complications can be achieved by the thorough training. In those long term patients more attention must be paid, however, also to rare complications, which may deteriorate not only the quality of life, but also result in death.

**Disclosure of Interest:** None declared.

#### MON-PO464

##### TITLE: EFFECT OF INDIVIDUALIZED DIETARY COUNSELING IMPROVE HYPERPHOSPHATEMIA AMONG HEMODIALYSIS PATIENTS

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**Rationale:** Hyperphosphatemia is a significant health problem in end stage renal disease (ESRD) patients on hemodialysis (HD). It can lead to cardiovascular, bone and other disorders as well as to secondary hyperparathyroidism and is also associated with increased prevalence of mortality in HD patients. The aim of present study was to evaluate effect of nutrition counseling and dietetic intervention on hyperphosphatemia management.

**Methods:** The study was organized big dialysis centers in Khartoum during 6 months. ESRD patients ( $n = 145$ ) on regular HD (two-three times weekly), dialyzed for at least 3 months were included to the study. They were divided into test group ( $n = 83$ ) and control group ( $n = 62$ ). The test group received nutritional counseling and consumed individualized diets (restricted in phosphate according to National Kidney Foundation) for a period of 6 months. The control group consumed usual diets. Serum phosphorus levels were measured at baseline and 2, 4 and 6 months after start of the study.

**Results:** Serum phosphorus levels decreased significantly from 5.6 mg/dL to at baseline 4.8, 4.2 and 3.8 mg/dL 2, 4 and 6 months after the onset of study in the test group. In control group the decrease was mild and insignificant (5.0, 5.0, 4.7 and 4.3 mg/dL, at baseline, 2, 4 and 6 months). Significant difference between groups were apparent in month 4 and 6 ( $p < 0.05$ ).

**Conclusions:** The study demonstrated that effective nutritional counseling was effective in the control and improvement of serum phosphorus level among HD patients. Therefore, nutritional counseling by qualified dietitians should be mandatory in renal units as part of the medical therapy management to reduce the incidence of hyperphosphatemia in HD.

**Disclosure of Interest:** None declared.

#### MON-PO465

##### THE USE OF THE INDIRECT CALORIMETER TO ESTIMATE BASAL ENERGY REQUIREMENT IN A WEIGHT MANAGEMENT PROGRAM FOR OSA PATIENTS: A PILOT STUDY IN HONG KONG.

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**Rationale:** Fifty-eight percentage moderate to severe obstructive sleep apnea (OSA) in adults are obese. Studies have proven that OSA patients are more prone to develop cardiovascular and metabolic diseases. Lifestyle modification program is recommended for all overweight OSA adults to improve airway patency. This review investigated the effectiveness of a weight management program using an indirect calorimeter to estimate the basal energy requirement for OSA adults in a Hong Kong acute hospital.

**Methods:** Seventeen obese OSA patients ( $BMI \geq 30 \text{ kg/m}^2$ ) with mean age of 49 year-old ( $SD \pm 9.9$  years) were recruited to attend an intensive weight management program from Jan to Dec 2018. Patients were seen by a dietitian monthly. Indirect calorimeter was used in the first assessment to accurately measure their basal energy expenditure (BEE). Bioelectrical impedance analyzer was used to collect the body weight, body fat percentage (Fat %), and fat free mass (FFM). Mean weight of the intervention group was compared with the historical control group ( $n = 17$ ), Fat %, FFM, and waist circumference (WC) were compared before and post intervention (the third intervention).

**Results:** The weight lost is significantly higher in the intervention group (IG). The baseline and post-test mean weight of the IG are  $107.0 \pm 26$  kg and  $105.0 \pm 24.9$  kg respectively ( $p < 0.01$ ). Whereas the baseline and post-test mean weight of the control group are  $93.2 \pm 19.4$  kg and  $93.6 \pm 19.2$  kg respectively ( $p = 0.48$ ). Fat % in the IG is significantly lowered at the post-intervention (baseline  $41.8 \pm 10.8\%$ , post-test  $40.7 \pm 11.5\%$ ,  $p < 0.01$ ). The FFM is significantly correlated with the BEE of the OSA patients in this pilot ( $p = 0.038$ ,  $r = 0.48$ ).

**Conclusions:** Using an indirect calorimeter can accurately estimate the basal energy expenditure for designing an effective diet plan for OSA patients. Lifestyle modification that can increase FFM may have a positive effect on the BEE of the OSA patients. A longitudinal study is recommended to investigate the sustainability of similar lifestyle modification program for OSA adults.

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**Disclosure of Interest:** None declared.

#### MON-PO466

##### THE EFFECTS A OF 12 WEEKS GROUP DIABETES EDUCATION PROGRAM ON FASTING PLASMA GLUCOSE FOR LAO PATIENTS WITH TYPE 2 DIABETES

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**Rationale:** The number of diabetics in the Laotian population is sharply rising. Therefore, there is an increased need for innovative thinking and effective treatment of diabetes. In Laos, diabetes schools have not previously been developed and implemented as part of the treatment of diabetes. The aim of the study was to implement a 12-week diabetes school for adults with type 2 diabetes and examine the effect on plasma glucose (FPG), weight change, body mass index (BMI), waist to hip ratio (WHR), blood pressure, lipid profile, HbA1c and the quality of life as well as the patient's own perception of their disease

**Methods:** One hundred patients with type 2 diabetes ( $\geq 18$  years) were randomized, 50 to the intervention group with participation in the 3-day diabetes school: nutritional advices, physical activity and understanding of disease and knowledge and management of diabetic late complications. 50 patients in the control group did not attend the diabetics school. The study was an unblinded. Quality of life (EQ-5D) and the patient's own perception of their disease are evaluated using semi-structured interviews by the staff.

**Results:** Twelve weeks of diabetic school reduces FPG significantly (intervention:  $-21.0$  mg/dl  $\pm 88.8$  mg/dl (SD) control:  $+18.6$  mg/dl  $\pm 48.8$  mg/dl (SD), ( $P = 0.02$ ). BMI was also significantly reduced in intervention group (intervention:  $-0.3681$  kg/m<sup>2</sup>  $\pm 0.62$  kg/m<sup>2</sup> (SD), control:  $+0.1042$  kg/m<sup>2</sup>  $\pm 0.90$  kg/m<sup>2</sup> (SD), ( $P = 0.05$ ). There is no effect of the intervention on HbA1c, blood pressure, WHR or lipid profile.

The two semi-structured focus group interviews showed, that many of the patients do not understand the consequences of their type 2 diabetes, and do not worry about the late complications before these are a reality. Dietary treatment and physical activity is not an integrated part of diabetes treatment in Laos, so this is unknown for both patients and for large numbers of health professionals.

**Conclusions:** The 12-week diabetes school reduces FPG and BMI. Disease insight is generally compromised in the Laotian population

with type 2 diabetes, so education such as the diabetes-school must be considered relevant to patients as well as health professionals.

**Disclosure of Interest:** None declared.

#### MON-PO467

##### SEPTIC, THROMBOTIC AND MECHANICAL COMPLICATIONS IN CENTRAL VENOUS CATHETERS OF NON ONCOLOGIC PATIENTS IN HOME PARENTERAL NUTRITION FOR CHRONIC INTESTINAL FAILURE. A RETROSPECTIVE OBSERVATION STUDY

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**Rationale:** Home parenteral nutrition is a life saving therapy for patients with chronic intestinal failure (IF). Central venous accesses (CVC) are essential devices for parenteral nutrition administration. Unfortunately the use of these devices can lead to catheter related blood stream infections (crbsi), thrombosis CVC-related, or mechanical complications that are associated with morbidity and mortality rates. The aim of the authors was to evaluate the rates of CVC-related complications in IF patients compared to international literature with a focus on Peripherally Inserted Central Catheter (PICC).

**Methods:** we retrospectively collected data on 144 patients regularly followed in our department from 10/1/2008 to 12/31/2015. For each patient we reported mechanical, thrombotic and infectious complications CVC-related.

**Results:**

Central venous catheters (CVC) Features	N(%)
Total number	304
Type of CVC	
Totally implanted	25 (8%)
Partially implanted	83 (27%)
Hohn	126 (41%)
Picc	64 (21%)
Others	2 (0.66%)
Not Known	4 (1.3%)
CVC-Site	
jugular int. Right/left	94 (31%)/62 (20%)
Subclavian Right/left	53 (17%)/27 (9%)
Brachial Right/left	16 (5%)/16 (5%)
Basilica Right/left	13 (4%)/7 (2%)
Not known	16 (5%)
Infusion frequency	
7/7	181 (60%), 102 (7%)
<7/7	117 (38%)
Not known	2 (2%)

**Conclusions:** Total adverse events rate was 0,92/1000 catheter days. Thrombosis' incidence was 0,08/1000 catheter days, sepsis' 0,34/1000 catheter days and mechanical complications' 0,48 /1000 catheter days. Cox regression showed that the presence of PICC increases thrombosis' risk 3,6 times and mechanical complications' risk 3,0 times compared to the others types of CVC; plus, an infusion rate 7/7 is related to an increased risk of crbsi.

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**Disclosure of Interest:** None declared.

#### MON-PO468

##### EFFECTS OF A HIGH-PROTEIN DIET ON GLYCEMIC CONTROL AND INSULIN RESISTANCE IN TYPE 2 DIABETES PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Rationale:** Obesity is a well-known risk factor of type 2 diabetes mellitus (T2DM), and it is commonly accompanied by T2DM. Recently some studies indicated that a high-protein diet was effective for weight loss, and therefore we hypothesized that a high-protein diet could help control blood glucose and mitigate insulin resistance (IR) by weight management in T2DM patients, which are key features of T2DM. The study aimed to systematically review the effects of a high-protein diet on glycemic control and IR in T2DM patients.

**Methods:** We searched four electronic databases until May 1<sup>st</sup> 2018 and included all randomized clinical trials comparing a high-protein diet with other diets. Two reviewers independently identified the trials for inclusion and independently extracted data. Either a fixed- or a random-effects model was used to combine the changes in each outcome from baseline to the end of the intervention. The meta-analysis was performed with RevMan 5.3 software.

**Results:** Twelve articles (thirteen studies) including 1138 T2DM patients met our inclusion criteria. Glycemic control was not significantly different between the high-protein diet group and control group, with the changes in fasting plasma glucose (FPG) (−0.13 (95% CI (−0.46, 0.19),  $p = 0.43$ ) mmol/L) and HbA1c% (−0.05 (95% CI (−0.18, 0.08),  $p = 0.92$ )) from baseline to the end of intervention. However, the difference in IR between the two groups was statistically significant. Most changes in lipids profiles were favorable. The changes in HDL, LDL, TC, and TG were +0.03 (95% CI (−0.04, 0.11),  $p = 0.35$ ) mmol/L, −0.10 (95% CI (−0.18, −0.02),  $p = 0.02$ ) mmol/L, −0.21 (95% CI (−0.31, −0.12),  $p < 0.01$ ) mmol/L and −0.19 (95% CI (−0.33, −0.05),  $p < 0.1$ ) mmol/L, respectively. The result of HOMA-IR was −0.31 (95% CI (−0.44, −0.18),  $p < 0.01$ ). Additionally, the difference in safety in terms of SCr (0.86 (95% CI (−1.92, 3.65),  $p = 0.54$ )) and eGFR (1.10 (95% CI (−1.34, 3.55),  $p = 0.38$ )) was not significant.

**Conclusions:** This review showed that a high-protein diet does not significantly improve glycemic control but can lower the levels of LDL, TC, TG and HOMA-IR in T2DM patients. In addition, a high-protein diet had no significant influence on safety. Further studies are needed to clarify the effects of a high-protein diet on glycemic control and IR in T2DM patients.

**Disclosure of Interest:** None declared.

#### MON-PO469

##### EFFECT OF HOME ENTERAL NUTRITION IN MALNOURISHED PATIENTS WITH INTESTINAL FAILURE/INTESTINAL INSUFFICIENCY

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**Rationale:** Weight loss is frequent in malnourished patients with intestinal failure/ intestinal insufficiency and poor nutritional status is a contributing factor to the reduced quality of life. Enteral nutrition is safe and effective in malnourished patients with chronic intestinal failure/intestinal insufficiency. Prospective study aimed at investigating the effects of home enteral nutrition in these patients are lacking. The aim of this study was to assess the nutritional status, quality of life, mortality and other clinical outcomes of home enteral nutrition in malnourished patients with intestinal failure/intestinal insufficiency.

**Methods:** The prospective observational study was carried out on 166 malnourished patients with intestinal failure/intestinal insufficiency in Jinling hospital from January 2016 to October 2018. All patients were supported with six months home enteral nutrition after discharge. Outcome measures included nutritional status, quality of life, mortality, enteral feeding gastrointestinal complications and other clinical outcome have been evaluated at 1, 3 and 6 months after discharge.

**Results:** One hundred and sixty-six patients were continued home enteral nutrition. The patient's body weight and nutritional status could be maintained and significantly increased during home enteral nutrition ( $p < 0.05$ ). Quality of life is also significantly improved during HEN ( $p < 0.05$ ). There was no difference between the incidence rates of tube and gastrointestinal complications in hospital and out of hospital ( $p > 0.05$ ) and the advanced age, diseases, low BMI and poor nutritional status were identified as high risk factors for poor clinical outcome.

**Conclusions:** HEN is a simple and feasible treatment to support malnourished patients with intestinal failure/intestinal insufficiency and improve quality of life and nutritional status.

**Disclosure of Interest:** None declared.

#### MON-PO470

##### APPLICATION OF N-3 FATTY ACID DETECTION AND INTERVENTION IN INFLAMMATORY AND ATHEROSCLEROSIS

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**Rationale:** Chronic metabolic diseases are closely related to the inflammatory response of human body, and many studies have reported that w-3 fatty acids can prevent the development of chronic metabolic diseases through anti-inflammatory mechanisms.

**Methods:** The author studied w-3 fatty acids improved LPS-induced systemic inflammatory response in mice as a visiting scholar at Harvard Medical School, and found that w-3 fatty acids could reduce the body's inflammatory response by inhibiting TLR4 pathway, and increase the body weight of mice, modify the nutritional status as well as the systemic inflammation.

**Results:** Subsequently, we conducted experiments of intervene in apoE<sup>−/−</sup> mice and RAW264.7 macrophages with w-3 fatty acids intervention supported by the National Natural Science Foundation of China (NSFC), through siRNA silencing and plasmid transfection, we proved that w-3 fatty acids could inhibit the inflammatory reaction and prevent the formation of atherosclerosis. TLR4 molecular pathway may be one of the possible mechanisms. At present, tandem mass spectrometry were used in our laboratory for clinical blood fatty acid detection, we tested the blood fatty acid in initial 102 patients with metabolic syndrome, and in all the cases, n-6/n-3 ratio increased.

**Conclusions:** Therefore, systematically studying the relationship between fatty acid ratio and changes in cardiovascular disease and metabolism in a large population, not only help to establish the normal range of fatty acids concentration for Chinese population, and also



provide an important scientific basis for early cardiovascular metabolic diseases prediction, prevention and intervention.

**Disclosure of Interest:** None declared.

#### MON-PO471

### EFFECT OF MODERATE- AND HIGH-INTENSITY ACUTE AEROBIC EXERCISE ON FOOD REWARD AND APPETITE IN METHAMPHETAMINE INDIVIDUALS

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**Rationale:** Advances in neuroscience identified drug addiction as a chronic brain disease, which is associated with overestimation of drug-related rewards and underestimation of 'natural', non-drug-related rewards. Methamphetamine (MA) is the second largest illegal drug abuse in the world and studies have shown that acute aerobic exercise can reduce abusers' sensitivity to MA-related craving. The aim of this study was to determine the effects of acute aerobic exercise on reward values of food and subjective feelings of appetite in MA abusers.

**Methods:** Forty-four men, who met the DSM-IV criteria for MA dependence, with BMI of  $24.8 \pm 3.1$  kg/m<sup>2</sup> and age of  $30.8 \pm 4.7$  years, were randomly assigned to two training groups: moderate-(n=22) and high-(n=22) group. Each group finished resting control or exercise condition for 35 minutes, 1 wk apart, in a counterbalanced order, with the moderate (65%~75% HRmax) and high (75%~85% HRmax) intensity separately. Food reward values for visual food cues assessed by the Leeds Food Preference Questionnaire and subjective feelings of appetite were measured after moderate- and high-intensity aerobic exercise, or resting control session.

**Results:** Greater implicit wanting for sweet vs. savoury taste foods was noted following exercise compared to the control session, and this was independent of intensity (high:  $P=0.011$ ; moderate:  $P=0.047$ ). Furthermore, the implicit wanting for savoury taste foods was higher following high intensity exercise compared to the control session ( $P=0.004$ ). High intensity exercise also significantly increases the subjective feeling of hunger ( $P=0.014$ ). Therefore, acute aerobic exercise, independent of intensity, increases the relative preference and implicit wanting for savoury relative to sweet taste foods. Additionally, significant effects were founded on the implicit for savoury taste foods and subjective feeling of hunger following acute aerobic high-intensity exercise, but not in moderate-exercise and control sessions.

**Conclusions:** Acute aerobic exercise, especially high-intensity exercise, can increase food reward and appetite in MA-dependent individuals.

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**Disclosure of Interest:** None declared.

#### MON-PO472

### NUTRITIONAL STATUS OF HEMODIALYSIS OUTPATIENTS WITH OSTEOSARCOPENIC OBESITY

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**Rationale:** Osteosarcopenic obesity has been reported to increase the risk of fracture of elderly people, dysfunction including daily living activities, and risk of infection. In this study, we investigated the situation of Osteosarcopenic obesity of maintenance hemodialysis outpatients.

**Methods:** The subjects were 102 patients (74 males, 28 females, average age  $69.4 \pm 13.1$  years old). The bone density (distal 1/3 of the radial bone), abdominal girth, grip strength, circumference of the lower leg (CC) were measured to evaluate bone mass, obesity (visceral fat accumulation) and sarcopenia. Furthermore, GNRI (Geriatric Nutritional Risk Index) of each evaluation group was compared.

**Results:** In the subjects, the bone mass was 26.5% or less of YAM 70% or less, 45.1% of visceral fat accumulation (abdominal circumference male 85 cm or more, female 90 cm or more) and 26.5% corresponding to sarcopenia. 3.0% of those who correspond to all three items. In addition, GNRI was  $90.2 \pm 6.3$  for YAM 70% or less, and  $82.9 \pm 6.6$  for sarcopenia.

**Conclusions:** As for Osteosarcopenic obesity of hemodialysis patients, it was considered necessary to further study the relationship with nutrition assessment index.

**Disclosure of Interest:** None declared.

#### MON-PO473

### N-3 PUFA-ENRICHED SEMI-VEGETARIAN DIET LOWERS LDL-CHOLESTEROL AND URIC ACID LEVELS IN PATIENTS WITH FAMILIAL HYPERCHOLESTEROLEMIA

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**Rationale:** Familial hypercholesterolemia (FH) is an inherited disorder caused mainly by mutations in the gene for the LDL receptor and characterized by high blood levels of LDL-cholesterol (LDL-C) conveying an increased risk of coronary heart disease (CHD). The efficacy of pharmacological lipid-lowering therapies, such as statin therapy, may be compromised by poor compliance and/or diet rich in refined carbohydrates or saturated fatty acids. Since n-3 polyunsaturated fatty acids (PUFA) may protect against CHD, we aimed to evaluate the effect of semi-vegetarian diet enriched in walnuts and oily fish as sources of n-3 PUFA on blood levels of LDL-C and uric acid (UA), the end product of purine catabolism that promotes atherosclerosis and arterial hypertension, in FH patients.

**Methods:** The experimental diet was individually prescribed for 19 unrelated patients with established FH (11 of them treated with statins: rosuvastatin, n=9, and atorvastatin, n=2) based on estimated energy requirement and reported intake during the baseline. Serum LDL-C and UA levels were measured at baseline and after 11–16 weeks of dietary intervention. The data were analysed using the paired t-test and the Wilcoxon matched-pairs test.

**Results:** At the end of the dietary intervention, FH patients showed a reduction in both LDL-C and UA serum levels: LDL-C decreased by 11.7% ( $p=0.0435$ ), and UA by 7.4% ( $p=0.0488$ ); while their BMI and WHR did not change during the study (mean BMI: 24.8 vs. 24.1 kg/m<sup>2</sup>, mean WHR: 0.89 vs. 0.87 at baseline and after the intervention, respectively).

**Conclusions:** Adherence to n-3 PUFA-enriched semi-vegetarian diet significantly lowers LDL-C and UA levels in the blood. Cardiovascular risk in FH patients can therefore be further reduced by appropriate dietary management, complementing pharmacological therapy.

**Disclosure of Interest:** None declared.

#### MON-PO474 EVALUATION OF RELATIONSHIP BETWEEN VISCERAL ADIPOSITY INDEX (VAI) AND BLOOD LIPIDS IN MULTIPLE SCLEROSIS (MS) PATIENTS

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**Rationale:** VAI is a marker of dysfunction for visceral fat tissue and associated with cardiovascular risk. Weight control is recommended for prevention of disease-related comorbidities in MS. There are not enough studies in literature that evaluated VAI in MS. Aim of this study was to determine effect of VAI on blood lipids in MS.

**Methods:** 29 male (25.9%) and 83 female (74.1%) relapsing remitting MS patients, diagnosed according to Mc Donald criteria were included study. VAI was calculated by following formula]:

Males:  $VAI = (WC/[39.68 + (1.88 \times BMI)]) \times (TG/1.03) \times (1.31/HDL)$

Females:  $VAI = (WC/[36.58 + (1.89 \times BMI)]) \times (TG/0.81) \times (1.52/HDL)$

Expanded Disability Status Scale (EDSS) and biochemistry results were obtained from patient follow-up system. The relationship between VAI and blood lipids was analyzed with Spearman correlation.

**Results:** Mean disease duration was 6.8±0.6 years and EDSS score was 0–6 points. 50.9% of them normal, 25.9% of them overweight and 23.2% of them obese. As VAI value increased Low Density Lipoprotein (LDL), total cholesterol and triglyceride increase, High Density Lipoprotein (HDL) decrease. As VAI increased HDL decrease in male and LDL increase in female. As Body Mass Index (BMI) increase, VAI increase in all patients except male. VAI value of obese is higher among all patient and specific for female. The duration of MS and EDSS score were not correlated with VIA.

#### Variables

Blood lipids	VAI (n = 112)
LDL	0.235*
HDL	-0.178
Total cholesterol	0.249**
Triglycerides	0.302**
BMI	0.371**

Correlation is significant \*p < 0.05; \*\*p < 0.01

**Conclusions:** In MS patients, VAI is associated with increased blood lipids and can use assessing the risk of cardiovascular disease.

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**Disclosure of Interest:** None declared.

#### MON-PO475 LOW BODY MASS INDEX PREDICTS SHORT- AND LONG-TERM CLINICAL OUTCOMES IN ASIAN CLINICAL PATIENTS

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**Rationale:** Studies on malnutrition suggest low body mass index may be associated with poor clinical outcomes. We aimed to investigate published data to identify whether low BMI could predict short- and long-term clinical outcomes in Asian hospitalized patients.

**Methods:** A search in the PubMed database including terms 'body mass index' or 'BMI' or 'malnutrition' or 'undernutrition' AND 'Asia' or 'Asian' AND/OR 'outcome' or 'complication' or 'mortality' or 'survival' or 'ICU' for publications in English in the past 10 years was conducted. Papers with data and clinical outcomes from Asian hospitalized patients with BMI <18.5 kg/m<sup>2</sup> or lower and sample size >50 were included. Forest plots were constructed to determine the odds of in-hospital complications, hospital mortality, ICU mortality and 5-year survival in patients with BMI <18.5 kg/m<sup>2</sup> versus BMI ≥18.5 kg/m<sup>2</sup>.

**Results:** Thirty-one studies were included, 16 of which analyzed the association between low BMI and clinical outcomes. The prevalence of BMI <18.5 kg/m<sup>2</sup> varied from 2.7% to 48.0% in different disease settings and varied Asian countries. Patients with BMI <18.5 kg/m<sup>2</sup> had higher overall complications (OR 1.99; 95% CI, 1.65–2.40), higher hospital mortality (non-ICU patients, OR 2.48; 95% CI, 2.42–2.55; ICU patients, OR 2.31; 95% CI, 2.25–2.38), and higher ICU mortality (OR 1.92; 95% CI, 1.84–2.01). Survival over 5 years was lower in the low BMI group (OR 0.30; 95% CI, 0.23–0.40).

**Conclusions:** Low BMI may predict worse short-term and longer-term outcomes in Asian hospitalized patients.

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**Disclosure of Interest:** None declared.

## Nutritional assessment II

#### MON-PO476 NUTRITIONAL STATUS ASSESSMENT AS A SURROGATE TO CLINICAL OUTCOME PREDICTION IN CARDIAC SURGERY PATIENTS

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**Rationale:** Malnutrition has been identified as major determinant of adverse clinical outcome following cardiac surgery. Our aim was to investigate whether the bioelectrical impedance analysis (BIA) indices, namely phase angle (PhA), fat mass (FM), fat-free mass (FFM) and tissue edema could serve as predictors of clinical outcome in cardiac surgery patients.

**Methods:** Prospective, cohort study enrolling 194 consecutive adult cardiac surgical patients (NCT03644030). Demographic, anthropometric and clinical data were collected. Before elective surgery each participant was subjected to BIA, for FM, FFM, intracellular, extracellular and total body water [ICW, ECW, TBW] and PhA calculation. The assessment was repeated on POD7. Patients with an early (<7 days) adverse outcome were excluded from final analysis. Prolonged

hospital length of stay (LOS) ( $\geq 14$  days) constituted the outcome of interest. Statistical analysis was performed by Mann-Whitney test, stepwise logistic regression analysis and ROC curve analysis.

**Results:** Of the total cohort, 179 patients with a hospital LOS  $\geq 7$  days were finally assessed. Nutritional status deteriorated significantly on POD7 ( $p < 0.01$ ). Postoperative total body weight, BMI, hand grip strength, arm perimeter, ECW (%), FFM (kg), ( $p < 0.01$ , for all) and PhA ( $p < 0.001$ ) were significantly impaired in patients with prolonged hospital stay. Among them, PhA (OR, 4.41; 95%CI, 1.72–11.3;  $p = 0.002$ ) and FFM (OR, 1.08; 95%CI, 1.01–1.15;  $p = 0.016$ ) were identified as the most reliable prognostic estimates of hospital-LOS  $\geq 14$  d. Both indices presented a satisfactory discriminatory performance (AUC-PhA, 0.81; 95%CI, 0.74–0.87;  $p < 0.001$ ; cut-off  $< 3.4$ , and AUC-FFM, 0.76; 95%CI, 0.68–0.82;  $p < 0.001$ ; cut-off  $< 56.6$  kg), in regards to hospital stay. Mortality rate upon hospital discharge was 6.1% ( $n = 11$ ).

**Conclusions:** Among the various BIA-derived indices which can serve as accurate indicators of poor nutritional status identification, low postoperative PhA and FFM values confer enhanced predictive ability of prolonged hospitalization in cardiac surgery setting.

**Disclosure of Interest:** None declared.

#### MON-PO477

##### APPLICATION OF GLIM CRITERIA FOLLOWING INITIAL SCREENING TO IDENTIFY AND CATEGORIZE PATIENTS WITH RESPECT TO NUTRITIONAL STATUS: AN INDIAN MULTI-CENTRE PILOT PROJECT

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**Rationale:** The purpose of this study is to apply **GLIM criteria** to identify the prevalence, **severity and aetiology of malnutrition** in hospitalised patients and identify the characteristics associated with it.

**Methods:** This cross sectional, observational study included patients  $\geq 18$  years admitted in two hospitals. All patients were screened within 24 hours of admission and more than 2/3<sup>rd</sup> patients found at risk were further assessed for presence of **Phenotypic and Etiologic criteria**

**Results:** Patients varied from young adults to elderly with 55% males and 45% females. Prevalence of **moderate** and **severe** malnutrition was **22%** and **33%** respectively. The proportion of **acute malnutrition with inflammation, chronic malnutrition with minimal/no inflammation, chronic malnutrition with inflammation and starvation** was **63%**, **22%**, **11%**, **4%** respectively. Prevalence of chronic diseases was 57.7%. Major infections, acute stroke and pancreatitis were most frequent causes of hospitalization. Almost all patients complained loss of appetite irrespective of severity and aetiology of malnutrition ( $p = 0.33$ ). More than half of patients consumed  $\leq 50\%$  EER and experienced unintentional weight loss. Only two –fifth patients consumed normal diet before hospitalisation. There was statistically significant difference between the mean current weight ( $p < 0.0001$ ), BMI ( $p < 0.0001$ ) and calf circumference ( $p < 0.05$ ) among the at risk, moderately and severely malnourished patients.

**Conclusions:** Prevalence of Disease Related Malnutrition was 53% with acute disease related malnutrition having maximum prevalence. GLIM is a **flexible model** offering many alternative parameters to classify malnutrition according to severity and aetiology and can be readily used in **set-ups with minimum available resources**.

**Disclosure of Interest:** None declared.

#### MON-PO478

##### ASSESSING THE NUTRITIONAL STATUS AND MACRONUTRIENT INTAKE OF PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS (SLE) AT OUT-PATIENT DEPARTMENT, RHEUMATOLOGY DEPARTMENT, YANGON SPECIALITY HOSPITAL, YANGON, MYANMAR

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**Rationale:** Patients with systemic lupus erythematosus (SLE) suffer from nutritional changes due to disease process or treatment. The nutritional status may vary from malnourishment to overweight. The dietary intake of the SLE patients is reduced due to low appetite, GI symptoms and dietary changes.

**Methods:** Cross-sectional descriptive study design was used. The study period was from October, 2017 to February, 2018. A sample of 53 participants was collected. To assess the nutritional status, BMI and SGA were used. To assess the macronutrients intake, 24 hour food recall was used.

**Results:** Mean age of SLE patients is  $31 \pm 10$  years. In the current study, a high prevalence of malnutrition was found. The nutritional status was assessed by Body Mass Index (BMI) and Subjective Global Assessment (SGA). Mean BMI is  $20.5 \pm 4$  kg/m<sup>2</sup>. 45.3% of malnourishment (undernutrition, overweight and obesity) was detected by using BMI. According to SGA, 57% of malnutrition was detected. Therefore, BMI alone is not enough to assess the nutritional status in such patients because these patients are prone to oedema and disease activity can also affect the nutritional status.

Macronutrient intake was assessed by 24 Hour Food Recall was collected for 2 non-consecutive days. Mean energy intake was  $877 \pm 190$  kcal per day while the TEE was  $1866 \pm 224$  kcal per day. Whether the patients have good or bad nutritional status, their dietary intake was lower than the recommended range in patients with SLE. Carbohydrate intake of the patients was between the acceptable range of 45–65%. Protein intake was near the lower limit of the range. Fat intake was found out to be nearly upper limit of the distribution range. In this study, Patients with SLE who consume less than or equal to 877 kcal per day have normal and underweight BMI scores. It was significant with P value 0.004. 60.9% of patients were consuming  $> 33$  grams of protein per day and they had SGA grade A. It was also significant with the P value of 0.005.

**Conclusions:** Hence, it is proved that the assessment of nutritional status should be an integral part of patient care, as the imbalance between adequate metabolism and immunity leads to malnutrition. Also, BMI alone cannot reflect the nutritional status of the patients with SLE. So, using BMI together with SGA will be more beneficial in such high risk patients. Malnutrition is more prone in patients with SLE and early detection of malnutrition will impact disease outcome and treatment. Thus, interventions aimed at promoting adequate nutritional status and food intake may contribute to reduction of comorbidities and improved quality of life in these patients.

**Disclosure of Interest:** None declared.

#### MON-PO479

##### EVALUATION OF SARCOPENIA THROUGH THE PSOAS INDEX IN PATIENTS SUBMITTED TO DIGESTIVE TRACT SURGERY AT HOSPITAL DO SERVIDOR PÚBLICO ESTADUAL DE SÃO PAULO, BRAZIL

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**Rationale:** Sarcopenia is directly related to the worst prognosis in hospitalized patients. For its early diagnosis the evaluation of the psoas using the CT scan proved to be an effective method.

**Methods:** A retrospective cross-sectional observational study was performed with patients undergoing gastrointestinal tract surgery at a state public hospital in São Paulo, Brazil, where the presence of sarcopenia was evaluated. From the analysis of transversal computed tomography images, the tissues around the third lumbar vertebra were differentiated and separated based on the specific density of each; the area of the psoas muscle was then calculated by the measurements of its greatest transverse and longitudinal diameters. Through the predictive equations developed by Mourtzakakis and colleagues (2008) the coefficient was calculated in order to predict patients' muscle mass and to identify those sarcopenic. Cut-off points for sarcopenia are <385 mm<sup>2</sup> for women and <545 for men.

**Results:** The sample for the composition of this study was 52 patients, with a mean age of 61.3 years ( $\pm 12.89$ ), being excluded 4 patients that were not quantified the coefficients. Of which 52.08% were considered sarcopenic.

**Conclusions:** The method proved to be effective for the diagnosis of sarcopenia, allowing the definition of the most appropriate therapeutic plan to be performed.

**Disclosure of Interest:** None declared.

#### MON-PO480

##### CORRELATION BETWEEN BODY SEGMENTS AND HEIGHT AMONGST ADULTS IN A SOUTH AFRICAN HOSPITAL POPULATION

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**Rationale:** Accurate height measurements is an important component of nutritional assessment. Stunting is reported to affect the growth of long bones in the lower body more than in the upper body and this may impact on the accuracy of height predictive equations based on body segments, when applied in populations with high levels of stunting, such as in South Africa.

**Methods:** A descriptive cross-sectional study was performed on 141 participants (20–50 yrs) who could stand up straight and unassisted for accurate height measurement, and who were recruited from the three public hospitals in Bloemfontein by convenience sampling. In addition to reference height, ulna length, knee height, tibia length, fibula length and foot length were measured. Spearman correlation coefficient was calculated and multiple regression analysis performed to assess which body segment is most closely associated with actual height.

**Results:** The participants were 61.7% male, with a median age of 38.8 years (IQR 10.1 yrs) and median height 169.3 cm for males and 158.4 cm for females. All body measurements segment were statistically significantly correlated with reference height. Knee height showed the strongest association with reference height in both males ( $R^2$  0.77) and females ( $R^2$  0.86), followed by tibia and fibula length. Foot length and ulna length showed the weakest correlation with reference height in males and females respectively. Multiple regression analysis found knee height to be best associated with reference height, whilst foot length and ulna length showed the weakest association with reference height.

**Conclusions:** In a South African population of hospitalised patients, lower body segments were more closely associated with reference height, than upper body segment. This may reflect the proportionally greater effects of stunting on lower body long bone growth. Therefore, in populations with high levels of stunting, equations to predict actual height, may be more accurate if based on lower body segments.

**Disclosure of Interest:** None declared.

#### MON-PO481

##### COMBINED VOLUME-VISCOSITY SWALLOW TEST AND VIDEOFUOROSCOPY IN THE DIAGNOSIS OF OROPHARYNGEAL DYSPHAGIA TO IMPROVE NUTRITIONAL ASSESSMENT

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**Rationale:** Determine the efficacy of volume-viscosity swallow test (V-VST) and videofluoroscopy (VF) to detect risk of oropharyngeal dysphagia (OD) and evaluate the nutritional assessment

**Methods:** For this prospective study 44 patients (age average 62  $\pm$  12) in Dysphagia Unit since November of 2015 were included.

V-VST and VF were used to evaluate the deglutition mechanism. Statistical analysis of the data was performed using the Statistical Package SPSS v15.0.

**Results:** The main causes of dysphagia were 27% stroke, 22% cognitive impairment (senility or presbyphagia), 9% psychomotor retardation and 7% amyotrophic lateral sclerosis

A total of 44 V-VST were performed. Dysphagia was detected in 80%, of which 11% presented a impaired safety (cough and voice changes were the most frequent symptom) and 31% presented impaired efficacy (piecemeal deglutition). The remaining 58% of the patients presented alterations in both.

In VF, dysphagia was detected in 70%, where 68% presented alterations in safety and efficacy (liquids penetrations to laryngeal vestibule) and efficacy (piecemeal deglutition and weak bolus propulsión).

Regarding to nutritional approach, adapted diet was prescribed to 43%, enteral nutrition by nasogastric and gastrostomy tube feeding was performed on 11%. Thickeners were prescribed in 30%.

**Conclusions:** An early and effective diagnosis of OD improves the patient's quality of life, and minimise the complications associated with swallowing disorders. V-VST and VF are low-cost screening methods and easy to apply. However, VF offers a higher sensitivity and specificity to personalized the nutritional assessment.

**Disclosure of Interest:** None declared.

#### MON-PO482

##### CHANGES IN BODY COMPOSITION AFTER 1 MONTH INTAKE OF HALAL MEAT

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**Rationale:** Muslim population is increasing in our country and several meat industries are using Halal ritual, which may change microorganism and transformation of muscle into meat. This is why we studied meat changes and human body composition in healthy volunteers before and after 1 month eating Halal meat and no other kind of meat.

**Methods:** 20 healthy adult volunteers (10 women) participated in the study. They changed their previous meat intake for 0.5 kg lamb and 0.5 kg calf Halal meat weekly (given by researchers) for 1 month, without any other change in their food habits. Meat was analysed by pHmetry, gravimetry (water), Kjeldahl method (proteins), Floch method, methylation and gas chromatography (lipids). Body composition was measured by bioimpedance (Tanita, Innerscan V, BC-601).

Data were processed with Microsoft Excel® and analysed with SPSS®, by one-factor ANOVA.

**Results:** Lamb Halal meat had more pH, humidity, lipids and proteins than no Halal lamb meat; calf Halal meat had a lower pH and fat content than no Halal calf meat ( $p < 0.05$ ).

Every item regarding body composition improved (statistically no significant) despite caloric intake was higher (Table 1). Weight loss was higher among women; fat mass loss, visceral fat loss, increase in caloric intake, metabolic age loss and increase in muscle, water and bone mass was higher among men (Table 1).

	Weight (kg)	% fat	Muscle mass (kg)	Bone mass (kg)	BMI	DCI (kcal)	Metab age	% total fat	Visceral fat level
WOMEN	-0,61	-1,23	0,79	0,01	-0,23	13,1	-0,9	0,9	-0,1
MEN	-0,22	-2,3	1,53	0,07	-0,09	183,1	-5,6	2,24	-0,6
ALL	-0,415	-1,765	1,16	0,04	-0,16	98,1	-3,25	1,57	-0,35

These surprising results despite the study was short, may indicate precocious desirable effects of intake of Halal meat. Nevertheless, part of this result may be due to assay effect, which we cannot evaluate because basal situation was the control of the intervention. As caloric intake was higher, the only confusion factor could be more physical activity.

**Conclusions:** Halal meat intake does not cause deleterious effects in body composition y it seems to improve such body composition despite a mildly higher caloric intake.

**Disclosure of Interest:** None declared.

#### MON-PO483

#### MODIFIED NUTRITION RISK IN CRITICALLY ILL (MNUTRIC) VS MALNUTRITION UNIVERSAL SCREENING (MUST) TOOL: DETECTING MALNUTRITION, SARCOPENIA AND MORTALITY

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#### Rationale:

Catabolic state of critical illness in association with inadequate nutrition will lead to malnutrition. Thereby early and accurate detection of malnourished patients is important. Various screening tools are used to detect malnourished hospitalized patients but not all are validated for the critically ill. The objective of this study is to compare the mNutric and MUST in assessing nutritional risk in the critically ill. Computed tomography was also used to detect sarcopenia. Correlation of malnutrition, sarcopenia and 1-year mortality was also investigated

**Methods:** A single-center retrospective cohort study in a 19 bed mixed ICU of a tertiary care hospital. 248 patients, aged  $62 \pm 18$ , 57% males, that stayed in the ICU > 48 hrs were analysed. The mNutric and the MUST scores were calculated for all patients. mNutric scores  $\geq 5$  and MUST scores  $\geq 2$  were considered as high nutritional risk. Demographic data, BMI, Outcome and abdominal CT scan were analysed. Outcome was available in 179 patients. Computed tomography (CT) scans (slice at the level of the 3rd lumbar vertebra) was used to identify sarcopenia. Cut off point for determining sarcopenia by CT was Skeletal Muscle Index- SMI  $55 \text{ cm}^2/\text{m}^2$  for men and  $39 \text{ cm}^2/\text{m}^2$  for women.

**Results:** 54% of the sample was at high nutritional risk according to mNutric while 14% according to MUST. Estimated overall mortality was 33% (25% mNutric  $\geq 5$ , 6% MUST  $\geq 2$ ). Malnourished patients according to mNutric had 2.7 times higher mortality risk (Table 1). Only 21% of

the patients had abdominal CTs but 37% of them had substantial edema (mean SMI =  $43 \pm 9.9$  in men and  $35 \pm 7.7 \text{ cm}^2/\text{m}^2$  in women) rendering the CT scan invalid of predicting sarcopenia. In the remaining 63% SMI was significantly lower in men ( $p < 0.001$ ) compared to cut-offs.

**Table 1**

Logistic regression [dependent variable mortality, independent variable mNutric (Model 1) and Must (Model 2)], corrected for age, BMI, sex.

	Variable	Odds Ratio	p	95% CI
Model 1	mNutric	2.7	0.02	1.2–6
	Age (per decade)	1.4	0.02	1.1–1.8
	BMI ( $\text{kg}/\text{m}^2$ )	1	0.36	0.9–1.03
Model 2	Sex	0.6	0.12	0.3–1.2
	Must	1.4	0.48	0.5–3.7
	Age (per decade)	1.6	<0.001	1.3–2.1
	BMI ( $\text{kg}/\text{m}^2$ )	1	0.5	0.9–1.1
	Sex	0.7	0.25	0.3–1.3

**Conclusions:** More than half of the patients were malnourished according to mNutric, while higher scores indicate increased mortality risk. MUST seems to underestimate malnutrition in ICU. Lower scores on SMI may be associated with mortality, but presence of edema lead to bias.

#### References

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**Disclosure of Interest:** None declared.

#### MON-PO484

#### PHASE ANGLE AND NUTRITIONAL STATUS PARAMETERS IN PATIENTS WITH HEAD AND NECK CANCER AT RISK AND NOT AT RISK OF DYSPHAGIA: PRELIMINARY RESULTS

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**Rationale:** Low value of phase angle have been found to be negative prognostic factor for survival in different types of cancer. The aim of the study was to investigate correlation between PA and nutritional status patients with head and neck cancer (HNC) at risk and not at risk of dysphagia.

**Methods:** The sample comprised 52 patients (32 males and 20 females), mean age  $56 \pm 13.4$  years, consecutively admitted to Otolaryngology Ward (March 2017-May 2018). Exclusion criteria were: chemo- or radiotherapy, spread of cancer, chronic liver and kidney diseases, epilepsy, metallic prosthesis, pacemaker or implantable defibrillators, lack of informed consent. Phase angle, PA (at 50 kHz) and body composition components (at 5, 50, 100 and 200 kHz) were obtained with BioScan Touch i8 (Maltron Int., UK). Screening for malnutrition and dysphagia was performed with NRS 2002 and EAT-10, respectively. Patients were divided into 2 groups: Group 1 (at risk of dysphagia) and Group 2 (not at risk of dysphagia). Statistical analysis was performed with Statistica 13.1PL. The protocol of the study was approved by the Medical University Ethics Committee

**Results:** Overall, 61.8% of patients were identified at risk of dysphagia. Accordingly to diagnostic criteria for malnutrition (ESPEN 2015)

32,35% had a FFMI and unintentional weight loss below proposed cut off values. Weight loss was significantly higher in patient at risk of dysphagia ( $5.1 \pm 5.8\%$  vs.  $1.2 \pm 1.8\%$ ,  $p < 0.0086$ ). The differences between phase angle (cellular biomarker) were not significant between analyzed groups ( $7.7 \pm 1.1^\circ$  Group 1 vs.  $7.8 \pm 1^\circ$  Group 2). PA was negatively correlated with EAT-10 and NRS 2002 results ( $r = -0.49$ ,  $p < 0.0073$  and  $r = -0.37$ ,  $p < 0.0292$ , respectively). Moderate positive correlation was found between PA and FFMI ( $r = 0.559$ ,  $p < 0.00059$ ), however differences between FFMI in analyzed groups were not significant.

**Conclusions:** Phase angle was within the range values in all HNC patients, however was lower in patients with low FFMI as well as at risk of dysphagia. Further investigation in a larger population is required.

**Disclosure of Interest:** None declared.

#### MON-PO485

##### ASSESSMENT OF THE PHYSICAL DEVELOPMENT OF CHILDREN AFTER OESOPHAGEAL RECONSTRUCTION – 10 YEARS FOLLOW-UP

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**Rationale:** The most common indication for oesophageal reconstruction in children is long-gap oesophageal atresia or complications after chemical burns. The aim of the study was to assess the physical development reflecting the nutritional status of children after oesophageal reconstruction (OR).

**Methods:** 25 children after OR with jejunal or colon conduit were included in the retrospective study. At the moment of operation they were in age of 9 months to 15 years. The assessment of their nutritional status basing on body weight and body height was performed before and at least 5 years after OR. Patients were classified into two groups regarding the reason of OR: group I – congenital atresia, group II – acquired stenosis of oesophagus. All patients before reconstruction were on enteral nutrition via gastrostomy. During at least 5 years of postoperative follow-up they were fed orally with a diet appropriate to their age.

**Results:** An improvement in the body mass of patients in both groups was found, to a lesser extent an improvement in growth, especially in the group II (Table 1).

	Group I				Group II			
	<3 and 3–25 percentile		25–75 and >75 percentile		<3 and 3–25 percentile		25–75 and >75 percentile	
	Body weight	Body height	Body weight	Body height	Body weight	Body height	Body weight	Body height
Before reconstruction [% of patients]	85%	80%	15%	20%	90%	70%	10%	30%
At least 5 years after reconstruction [% of patients]	70%	40%	30%	60%	55%	77%	45%	23%

**Conclusions:** The patients after OR require permanent nutritional care. Despite of restoring of oesophageal continuity and physiological way of eating, their physical development of some of them is not satisfactory.

**Disclosure of Interest:** None declared.

#### MON-PO486

##### THE 10-POINT VERBAL AND VISUAL ANALOGUE SCALES FAIL TO ASSESS DIETARY INTAKES AND MALNUTRITION IN ELDERLY HOSPITALIZED IN ACUTE GERIATRICS UNIT

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**Rationale:** Low energy (EI) and protein (PI) intakes during hospital stay contribute to worsening nutritional status and are associated with increased mortality in elderly. The use of 10-point verbal (AveS) and visual (AViS) analogue scales allows a quick assessment of EI and malnutrition but is not validated in elderly hospitalized in Acute Geriatrics Unit (AGU).

**Methods:** We consecutively recruited 155 patients hospitalized in the AGU of three French hospitals. Malnutrition was diagnosed using BMI, weight loss, short form of Mini Nutritional Assessment, or hypoalbuminemia (if Protein-C-Reactive  $< 15$  mg/l). One interviewer performed AveS and AViS. Mean daily EI and PI were calculated from 3-day dietary records. Cognitive status was evaluated using the Mini Mental State Examination (MMSE).

**Results:** Among 155 patients (70% female, mean age 86 years), 60% were malnourished. The mean daily EI and PI were 1366 kcal (22 kcal/kg/day) and 55 g (0.89 g/kg/day) respectively. Only 17% of them achieved the recommendation for EI and PI. AveS was not correlated with EI ( $\rho = 0.161$   $P = 0.05$ ) and PI ( $\rho = 0.138$   $P = 0.09$ ) whereas AViS was poorly correlated with EI ( $\rho = 0.212$   $P = 0.009$ ) and PI ( $\rho = 0.194$   $P = 0.02$ ). Correlations were not ameliorated in the patients with better cognitive functions (MMSE  $\geq 24$ ,  $N = 69$ ). Sensitivity, specificity, positive and negative prospective values for assessing malnutrition were respectively 0.41, 0.58, 0.59 and 0.40 using AveS  $< 7$  and 0.51, 0.56, 0.63 and 0.43 using AViS  $\leq 0.5$  portion.

**Conclusions:** In contrast to younger adults, AveS and AViS were poorly correlated with dietary intakes and had low diagnostic performance for assessing malnutrition in elderly hospitalized in AGU. Regarding the high prevalence of malnutrition and the low EI and PI for the vast majority of patients, food supplementation could be systematically proposed.

**Disclosure of Interest:** None declared.

#### MON-PO487

##### IMPACT IN NUTRITIONAL STATUS AND DIET PROGRESSION OF A NUTRITIONAL CONSULTATION AFTER STOMA CONSTRUCTION

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**Rationale:** In ostomized patients the oral diet reintroduction should be performed progressively. In addition, malnutrition is a long-term complication. Our objective is to evaluate the impact of a nutritional consultation at discharge in these patients.

**Methods:** A prospective study was performed. At discharge, the patient has two appointment with dieticians for assessment and diagnosis, a review of diet progression and nutritional treatment. The patient's weight was recorded and nutritional profile was requested (albumin, prealbumin) at 7–10 days (visit1) and a month later (visit2). Statistical analysis was performed.

**Results:** 77 patients were recruited,  $65.7 \pm 12.5$  years, 74% men, 54.5% colostomies. Nutritional diagnosis at Visit1 was 37.1% good nutritional



status, 16.1% nutritional risk, 19.4% mild malnutrition\*, 22.6% moderate\* and 4.8% severe\*; At Visit2 was 62.9% good nutritional status, 24.2% nutritional risk and 6.4% mild malnutrition\*, 4.8% moderate\*, 1.6% severe\* (\*All protein-calorie). Weight's difference between Visit1 and Visit2 was  $+1.1 \pm 3.7$  kg ( $p=0.001$ ). The mean nutritional parameters measured between Visit1 and Visit2 were respectively: Albumin 3,6 g/dL and 4,1 g/dL ( $+0.5 \pm 0.4$ ,  $p=0.002$ ), PreAlbumin 21.3 mg/dL and 26,4 mg/dL ( $+8.1 \pm 7.1$ ,  $p=0.003$ ). At Visit1 5.2% of the patients tolerated soft diet, 50.6% complete, 2.6% astringent and 35.1% low-residues; 42.9% required oral supplementation (mean extra 800 kcal/patient). At Visit2 71.2% tolerated complete diet requiring supplementation 33.8% (mean extra 600 kcal/patient)

**Conclusions:** The nutritional consultation for ostomized patients has allowed us to achieve a good nutritional status or maintain the nutritional status in most patients with a correct transition of the diet and an optimization in the use of oral supplements.

**Disclosure of Interest:** None declared.

#### MON-PO488

##### EVALUATION OF QUALITY OF LIFE AFTER NUTRITION CONSULTATION IN OSTOMIZED PATIENTS

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**Rationale:** Ostomized patients must face situations that can heavily affect their quality of life. The goal of the study is evaluate this quality of life after the implementation of a nutritional consultation at surgery discharge.

**Methods:** A prospective study was performed. At discharge, the patient's weight was recorded and an analytical study was requested. At 7–10 days (visit1) and a month later (visit2), the patient visits nutritionist consultation for assessment and diagnosis, diet progression review and output stoma control education. In both visits, quality of life was evaluated using the Montreux questionnaire, validated in ostomized patients, which assesses the quality of life, including items on self-sufficiency and well-being. Descriptive statistical analysis was performed.

**Results:** 50 patients were recruited, 74% men,  $67.19 \pm 12.85$  years, 62% colostomies, 38% ileostomies. 74% of cases associated with an oncological process, where 78% of patients did not receive chemotherapy in the 1st and/or 2nd visit. Education level: 37% primary education, 39.1% secondary education, 10.9% university studies, 13% without studies. Employment status: 10.6% unemployment, 21.3% work, 53.2% retirement, 8.5% work leave, 6.4% family/home Care. Nutritional diagnosis at Visit 1 was 38% good nutritional status, 6% severe protein-calorie malnutrition. At visit 2 was 65.9% good nutritional status, 2.4% severe protein-calorie malnutrition. The score in Quality of life index increased between visits from  $57.62 \pm 14.15$  to  $63.29 \pm 16.43$  ( $p=0.034$ ) and the Physical well-being from  $53.03 \pm 19.56$  to  $61.14 \pm 16.96$  ( $p=0.011$ ).

**Conclusions:** It shows an improvement in the quality of life measured in our patients after the nutritional intervention, as well as a significant improvement in the physical well-being.

**Disclosure of Interest:** None declared.

#### MON-PO489

##### GLIM IN PRACTICE: SENSIBILITY AND PROGNOSTIC VALUE FOR THE DIAGNOSIS OF MALNUTRITION OF GASTROINTESTINAL SURGICAL PATIENTS

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**Rationale:** The Global Leadership Initiative on Malnutrition (GLIM) is a tool that aims to provide the nutritional status diagnosis based on objective criteria different clinical contexts.

**Methods:** Patients with gastrointestinal diseases admitted in the hospital for elective operations were evaluated within the first 24 hours of hospitalization. The patients were classified according to the Subjective Global Assessment (reference method), the handgrip strength and the GLIM. Muscle mass was evaluated by mid-arm muscle (MAM), fat-free mass index (FFMI) by bioimpedance and calf circumference (CC). Thus, the combination of each phenotypic factor with 1 etiologic resulted in 10 GLIM models: G1: %weight loss +decreased food intake (DFI); G2: Body Mass Index (BMI)+DFI; G3: MAM+DFI; G4: FFMI+DFI; G5: CC+DFI; G6: %weight loss +Inflammation (IN); G7: BMI+IN; G8: MAM+IN; G9: FFMI+IN; G10: CC+IN. Postoperative complications (POC) and length of stay (LOS) were assessed. The area under the curve (AUC) was calculated and a  $p < 0.05$  was considered statically significant.

**Results:** There were evaluated 118 patients, mean age  $56,6 \pm 14,9$  years old with 55.1% being female. Most of the patients underwent colonic resections (36.4%), 33.9% esophageal, gastric and duodenal operations, 12.7% had liver and biliary tract procedures and others (17%). Complications were seen in 20.6%, and 3.4% died. According to SGA, 51.7% of patients were undernourished. Low handgrip strength was seen in 70.7%. Using the GLIM G1 model 34.7% were malnourished, G2–18.6%, G3–11.0%, G4–19.6%, G5–28.0%, G6–44.9%, G7–21.2%, G8–12.7%, G9–29.9% and G10–37.3%. The best models according to the AUC was the G6 (AUC=0.85), G1 (AUC=0.80) and G5 (AUC=0.75) ( $p < 0,05$ ). The median length of hospital stay was 7 days (minimum 2 days; maximum 114 days). There were no differences ( $p > 0,05$ ) between nutritional status in regards to POC and LOS independently of the used assessment tool.

**Conclusions:** The GLIM models that presented the best sensibility for malnutrition diagnoses were G6 and G1.

**Disclosure of Interest:** None declared.

#### MON-PO490

##### BIOELECTRICAL IMPEDANCE ANALYSIS DEVICES: ARE THEIR RAW MEASUREMENTS INTERCHANGEABLE?

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**Rationale:** One of the most frequently used bioelectrical impedance analysis (BIA) equations for skeletal muscle mass estimation (Jenssen's equation) and the new BIA equation for fat-free mass (FFM) estimation for the Brazilian population were both developed using RJL devices, however, it is unknown whether the raw measurements [resistance (R) and reactance (Xc)] from different BIA devices are interchangeable and could be applied in these equations. The objectives of this study are: to

compare these raw measurements from five different BIA devices; compare FFM estimated from the Brazilian equation developed for RJL (FFM<sub>RJL</sub>) when R and Xc were measured by other devices; and generated conversion equations for R and Xc from other devices, having RJL measurements as reference.

**Methods:** We compared R and Xc from four different BIA devices in a sample of 200 healthy subjects in a random order of tests, and each device was compared to RJL values. After excluding outliers, the agreement between each pair of devices was assessed using Bland-Altman (BA) plots, and also precision, accuracy, and concordance correlation coefficient (CCC). Linear regression analysis was used to generate conversion equations for R and Xc from each device on corresponding R<sub>RJL</sub> and Xc<sub>RJL</sub> (reference values), respectively for each sex. We also assessed the agreement between FFM<sub>RJL</sub> and FFM estimations using the raw values derived from each device and after proposed conversions.

**Results:** Differences among R-values varied from 3.28 to 6.27 ohms, and precision, accuracy, and CCC were high (0.997–0.999). Differences among Xc-values were higher than for R values (from 3.43 to 15.80 ohms) and results for precision, accuracy, and CCC varied from 0.242 to 0.989. Compared to FFM<sub>RJL</sub>, FFM was underestimated using all the four devices, ranging from 0.91 to 3.01 kg, and 0.38 to 1.53 kg for men and women, respectively. After R and Xc conversions, FFM estimations from all devices were very similar compared to FFM<sub>RJL</sub>, except one device for men.

**Conclusions:** There were variations in raw measurements across BIA devices, which were more pronounced for Xc values. This resulted in an underestimation of FFM<sub>RJL</sub>. R and Xc conversion equations attenuated the underestimation and they should be used when a non-RJL device is used for BIA measurements and applied in a RJL equation.

**Disclosure of Interest:** None declared.

#### MON-PO491

##### FIVE YEARS OF THE FIRST INTERDISCIPLINARY SPECIALIZED CLINIC DEDICATED TO TRACHEOSTOMY PATIENTS IN AUSTRIA

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**Rationale:** Patients with a tracheostomy have complex requirements especially the nutrition situation is often unsatisfactory. In order to improve this an interdisciplinary (**ENT specialist, speech therapist, certified nurse, dietitian**) specialized clinic dedicated to tracheostomy patients was established.

**Methods:** In the period from November 2012 until December 2018 144 patients (111 men, 31 women, 2 children) were supervised by a dietician. For this a dietary tracheostomy assessment was developed, which also served for documentation and follow-up purposes. It includes the screening tool **NRS-2002** recommended by ESPEN after Kondrup J. et al. [1], parameters of nutritional and medical status, information about the type of food intake, nutrition-related problems, diagnoses, and treatment status.

**Results:** At first assessment the mean body weight was 69.32 kg (R: 22–119.45) corresponding to a BMI of 24.62 (R: 12.9–50.7). **According to the results of the nutritional screening using NRS-2002 73 persons (50.69%) were at nutritional risk (NRS-2002 score  $\geq$  3 Points) at their first presentation in the clinic.**

The main content of dietetic advice and diet therapy were the assessment of caloric intake, adaptation of enteral nutrition, energy fortification by using natural foods, consistency adjustment, protein enrichment using conventional foods, use of oral nutritional supplements and initiating tube feeding.

71 patients (49.31%) received clinical nutrition (43 [30%] PEG/PEJ, 23 [16%] were fed with nasogastric tube and 2 [1%] with central venous catheter), followed by 60 persons (41.67%) who took food orally and 13 patients (9.03%) who supplemented their oral nutrition with (par-) enteral nutrition.

In the subgroup ( $\geq$ assessment surveyed three times, 45 p.) the following outlook emerges: The body weight (MW: 66.84  $\rightarrow$  68.23 kg) and the BMI (MW: 23.61  $\rightarrow$  24.09) increased slightly. The NRS 2002 score shows a positive redistribution (NRS 0–2 [20  $\rightarrow$  27]; NRS 3–7 [25  $\rightarrow$  18]) of the nutritional risk.

**Conclusions:** The involvement of the Department of Dietetics and Nutrition optimizes the nutritional care for inpatients and is adapted to the individual requirements of prescription of oral nutritional supplements and enteral nutrition for outpatients.

#### Reference

1. Kondrup J. et al., *Clinical Nutrition* 2003; 22: 415–421.

**Disclosure of Interest:** None declared.

#### MON-PO492

##### URINARY EXAMINATIONS FOR ESTIMATION OF FAT FREE MASS IN PATIENTS WITH INTESTINAL FAILURE?

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**Rationale:** Altered body composition is a well-known complication in patients with intestinal failure (IF) due to malnutrition and malabsorption. Measurement of body composition is not always available nor affordable. However, urinary urea nitrogen and creatinine are measured at low cost in most laboratories. Thus, our *aim* was to examine the association between fat free mass and calculations based on urinary urea nitrogen and creatinine excretion.

**Methods:** A cross-sectional study with patients stratified according to the use of oral nutrition (ON) or home parenteral nutrition (HPN). We recorded age, gender, body mass index (BMI), fat free mass by bioelectrical impedance analysis (FFM-BIA), 24 h urinary urea nitrogen (UUN) and creatinine. We calculated creatinine height index (CHI %) and FFM as  $23.3 \times \text{u-creatinine (g/d)} + 21.2$  (FFM-calc) (Welle 1996).<sup>1</sup> *Statistics:* T-test, Chi-square test, Pearson correlation and Bland-Altman plot. Significance level:  $p < 0.05$ .

**Results:** In total 277 patients were included in the study (age  $59 \pm 15$  Y, male 44%, BMI  $22.1 \pm 4.3$  kg/m<sup>2</sup>). The two groups were comparable according to age and gender, but HPN patient had higher UUN and lower BMI, u-creatinine, CHI %, and FFM. The FFM-BIA correlated to CHI % ( $r = 0.223$ ,  $p < 0.001$ ), UUN ( $r = 0.242$ ,  $p < 0.001$ ) and FFM-calc ( $r = 0.657$ ,  $p < 0.001$ ). The correlation between FFM-BIA and FFM-calc was not related to the use of HPN ( $r = 0.38$ ,  $p = 0.67$ ), thus, the two groups were combined in a Bland-Altman plot showing limits of agreement:  $-12.2$ – $17.9$  kg and an intra class correlation coefficient of: 0.66.

**Conclusions:** In lack of equipment to measure the fat free mass we found that Welles equation for calculating fat free mass, is more suitable than creatinine height index or urine urea nitrogen alone. However, the equation is not precise and needs to be adjusted and validated in patients with intestinal failure.

#### Reference

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**Disclosure of Interest:** None declared.

### MON-PO493 SPORT NUTRITION KNOWLEDGE, BEHAVIORS AND SLEEP HABITS IN PORTUGUESE HIGH-PERFORMANCE CANOEISTS

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**Rationale:** Along with training regime, adequate food intake and appropriate sleep patterns are crucial for athletic success. This study aims to evaluate sport nutrition knowledge, behaviors and sleep habits among high-performance canoeists.

**Methods:** 46 Portuguese canoeists (28.3 ± 8.6 yrs old, 87% male and 13% female) participating in the 2015 National Cup of Canoeing were included. A self-administered questionnaire was applied to collect the following data: socio-demographic, anthropometric, training, sport nutrition knowledge (Walsh et., 2011), behaviors and sleep habits. This study was approved by the Ethical Committee of the University Fernando Pessoa and written informed consent was obtained from all participants. Descriptive linear regression analysis and Pearson correlation coefficients were performed using SPSS. The significance level was 5%.

**Results:** Participants (73.8 ± 3.4 kg; 1.75 ± 1.12 m; 23.6 ± 3.4 kg/m<sup>2</sup>) trained a mean of 16.8 ± 8.2 h/week and slept significantly less on weekdays (6.4 ± 2.3 h) than on weekends (10.0 ± 2.3 h,  $P < 0.001$ ). The average number of nutritional knowledge questions answered correctly was 10.3 ± 1.9, giving a mean nutritional knowledge score of 64.7%; no differences were observed between genders ( $P > 0.05$ ). Questions on carbohydrates were answered more accurately (63.8%), with those on proteins and fat being answered most poorly (29.8% and 2.1%, respectively). Although most athletes were aware of hydration (75.8%), they considered beer (27.7%) less caloric than Coca-Cola (17.0%). Most participants were not aware that they should eat immediately after training/match to start refuelling (76.6%). Vitamin and mineral supplements were reportedly used by 61.2%. There was a high consumption of fruits and vegetables (91.5%) and 96.4% ate breakfast daily; 4.3% reported not having a healthy diet and consuming alcohol (12.8%).

**Conclusions:** Athletes would benefit from sport nutrition education and sleep monitoring that enhance health and sport performance.

#### Reference

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**Disclosure of Interest:** None declared.

### MON-PO494 THE USE OF NUTRITIONAL SUPPLEMENTS, SOURCES OF INFORMATION AND REASONS FOR THEIR USAGE AMONG PORTUGUESE ATHLETES OF BOTH GENDERS

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**Rationale:** The use of nutritional supplements has been increasing widely; however, many athletes are not well informed about their effects. This study aimed to evaluate the consumption of nutritional

supplements in a group of athletes, determining sources of information, as well as, reasons for their use in different sports.

**Methods:** Eighty-nine athletes (26,95 ± 5,9 years old) from 3 different sports, namely crossfit (n = 23), football (n = 22) and volleyball (n = 21) were interviewed and evaluated in order to collect information on anthropometric data, training volume and behavior associated with the use of nutritional supplements. Also the athletes' nutritional knowledge about supplementation was assessed. Weight, height and waist and hip circumferences (WC and HC, respectively) were measured according to international guidelines. Body mass index was calculated. This study was approved by the Ethical Committee of the University Fernando Pessoa and written informed consent was obtained from all participants. Descriptive linear regression analysis and Pearson correlation coefficients were performed using SPSS version 25. The significance level was 5%.

**Results:** Participants trained an average of 5.2 ± 1.3 times/week with a duration 1.9 ± 0.7 h/week. Female (n = 30) athletes' BMI was 23.02 ± 2.46 kg/m<sup>2</sup> and males' (n = 59) was 24.28 ± 1.80 kg/m<sup>2</sup>. Surprisingly, no significant differences were observed between gender ( $P > 0.05$ ). Many athletes consumed supplements during sports season (65.4%). Although 31.6% reported the nutritionist or the physician (11.8%) as the main sources of information about nutritional supplements, most athletes (65.1%) reported not having sufficient knowledge about the use and the risks of nutritional supplements. The two main reasons for using nutritional supplements were: to improve athletic performance (65.3%) and to accelerate recovery after a training or competition (29.4%).

**Conclusions:** Nutritional education among athletes and coaches is crucial for a healthy training regime and a successful athletic performance.

**Disclosure of Interest:** None declared.

### MON-PO495 INNOVATIVE TECHNOLOGIES FOR IMAGE CAPTURE FOOD INTAKE ASSESSMENT: A TOOL FOR CLINICAL AND EPIDEMIOLOGICAL RESEARCH?

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**Rationale:** The reference method for assessing nutrient intakes is the traditional food survey, which faces a problem of quantification and under-reporting. The use of innovative technologies is becoming a solution for nutritional assessment. We conducted a systematic review of articles published between 2007 and April 2019 on nutritional intake assessment tools using image capture on smartphones. We aimed to assess their reliability in epidemiological studies too.

**Methods:** Identification on Pubmed of articles in English on the following inclusion criteria: studies on populations of all ages and ethnic groups, with/without pathology, using photos to evaluate food intake. Studies analysing the influence of photography on dietary behaviour, technologies not using image capture, protocols using an image catalogue were excluded.

Main criterion of the study: Image capture of dishes by photo  
Secondary criterion: Comparison between the reference method and new technology of the results obtained on qualitative and quantitative estimations of dishes.

**Results:** 565 articles were identified by keywords, 70 by title and abstract, 18 finally included:

- 3 studies focused on the automatic acquisition of images and estimation of quantities. This procedure only requires the user to take a picture. The application will automatically estimate the volume and recognize the food by image processing algorithms, facilitated by a fiduciary marker. A nutritional analysis can also be performed by software with coding systems



- 15 studies used image capture alone followed by analysis by a nutrition professional. The user had to take pictures of his meals or snacks before and after consumption. He was also asked to describe the food, quantities, brands, cooking methods in writing or orally. The specialist had to evaluate and analyse energy intakes.

Studies used heterogeneous protocols. The reliability of the caloric estimation by image capture was compared to the gold standard (double-labelled water test) and conventional methods. The results for image capture were closer to the gold standard, better than with conventional methods.

**Conclusions:** Image capture methods are still uncommon in research and clinical practice. The most commonly method in epidemiology is to use a single image capture analysed by a trained dietician. The published studies do not sufficiently compare technological performance with standard methods for estimating nutrient intake. To be useful in epidemiological and clinical research, these tools need to be improved, in particular to correct underestimated fats or added sugars.

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**Disclosure of Interest:** None declared.

#### MON-PO496

##### HEPATOBIILIARY COMPLICATIONS OF TOTAL PARENTERAL NUTRITION MANAGEMENT WITH TAURINE ENRICHED AMINOACID SOLUTIONS.

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**Rationale:** Hepatobiliary complications of total parenteral nutrition (TPN) appear in up to 90% of patients receiving TPN. Certain hepatoprotector effect has been associated with taurine enriched solutions. The aim of this study is to describe the variations on hepatic parameters like gamma glutamil transferase (GGT), alkaline phosphatase (ALP) or bilirubin (Br).

**Methods:** Observational, retrospective and longitudinal study was performed. Patients who have received TPN with taurine supplementation for almost 3 days from January 2016 to December 2017 were included. Demographic and laboratory data were collected from hospital electronic records. Laboratory data collected were GGT (also in days 3, 7, 10 and 14), ALP, Br, lactate dehydrogenase (LDH) and transaminases (AST and ALT) at the beginning and at the end of TPN administration. We also collected data about reductions in lipid and infusion times (cyclic TPN). Median values of GGT, AST, ALT, LDH, Br and ALP were compared. Excel<sup>®</sup> was used to perform statistical analysis.

**Results:** A total of 60 patients were included, 68.3% males with a median age of 69 years (IQR: 56–75). Mean TPN duration was 9 days (IQR: 4–17). Lipid reductions were observed in a 95% of patients and a 75% of patients had cyclic TPN

Respecting to GGT variation from initial values we observed increases of 10.7% at day 3, 32.1% at day 7, 31.8% at day 10 and 15.7% at day 14. Comparing initial and final values we observed a variation of –0.2%. Increases in ALT (7.8%), LDH (4.2%), ALP (22.6%), AST (15.9%) values were observed and also a decrease on Br value (–7.8%) when comparing initial and final values.

**Conclusions:** In our study population, the use of taurine enriched solutions in TPN did not seem to have a beneficial effect on hepatobiliary complications associated with TPN. We have not observed analytic improvement in any of laboratory data analysed, with the exception of Br.

**Disclosure of Interest:** None declared.

#### MON-PO497

##### HANDGRIP STRENGTH AMONG HEALTHY AMBULATORY ADULT FILIPINOS

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**Rationale:** Nutritional assessment is usually obtained using the mass index (BMI) representing physical size (weight/height<sup>2</sup>). However, nutritional assessment may be better assessed using functional lean body mass by handgrip strength. No handgrip strength values are available to assess healthy ambulatory adult Filipinos.

Handgrip strengths of normal ambulatory adult Filipinos were measured using a handgrip dynamometer. The values were used to calculate the mean and standard deviation for male and female in different age groups.

**Methods:** This is a cross sectional prospective study assessing the handgrip strength of healthy ambulatory adult Filipinos participating in two clinical gatherings. 911 ambulatory adult Filipinos consisting of 318 males and 593 females were tested for handgrip strength using Camry handgrip dynamometers. Each participant performed three strongest 5-second grips using their dominant hand. Their height and weight were measured using a weighing scale with stadiometer. Participants with an injury, previous surgery or stroke on their dominant hand were excluded. Data were grouped according to sex and age groups. Each set of data was then computed to represent values showing  $\pm 2$  standard deviations.

**Results:** Healthy ambulatory adult Filipinos showed a mean handgrip strength of 28.7 with males = 38 and females = 23.7. The handgrip values within 2 standard deviations of healthy ambulatory adult Filipino males were: ages 18–29 = 14.3–62.7; ages 30–44 = 13.2–64.6; ages 45–59 = 15.1–60.9; and ages  $\geq 60$  = 14.2–38.0; while for females were: ages 18–29 = 12.0–36.2; ages 30–44 = 12.8–36.8; ages 45–59 = 5.4–38.8; and ages  $\geq 60$  = 7.5–41.9.

**Conclusions:** Mean handgrip strength values and standard deviation values were higher for males and lower for females. The study recommends association of handgrip strength values among male and female populations as well as in correlation to BMI.

#### Reference

1. Nutritional Assessment and Handgrip strength of candidates for surgery at the gastrointestinal tract. Thalita Morgana Gulmaraes *et al.*

**Disclosure of Interest:** None declared.

#### MON-PO498

##### PHASE ANGLE AS A MARKER OF MICROVASCULAR DAMAGE IN SYSTEMIC SCLEROSIS

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**Rationale:** Systemic Sclerosis (SSc) is a connective tissue disease characterized by microvascular damage and impaired angiogenesis. The integrity of endothelial cell is important to its physiological function such as production of mediators of angiogenesis. Bioimpedentiometry (BIA)-derived Phase Angle (PhA) has been proposed as a marker of cell membrane integrity. The aim of the study was to assess whether PhA is altered in patients with SSc and whether its values correlate with VEGF levels and digital microvascular damage.

**Methods:** SSc patients underwent to BIA evaluation and VEGF determination. Disease activity index (DAI) and nailfold videocapillaroscopy (NVC) were performed. For statistical analysis, Kruskal–Wallis or Student's test for continuous variables, Chi-square or Fisher's exact test for categorical variables and multiple regression analysis to evaluate correlation between continuous variables, were used.

**Results:** Fifty-five SSc patients were enrolled (46 females; mean age 53 ±14 years). Median VEGF value was significantly higher in SSc patients than in healthy controls [224 (95–435) vs 110 (65–217),  $p=0.035$ ]. Median PhA value was significantly lower in SSc patients than in healthy controls [4.6 (2.5–6.7) vs 5.8 (5.7–6.5),  $p<0.0001$ ]. VEGF and PhA positively and significantly correlated ( $p=0.009$ ,  $r=0.1$ , beta coefficient=1.48) in SSc patients, while a negative correlation between VEGF and DAI ( $p=0.048$ ,  $r=-0.05$ , beta coefficient=0.48) was found. PhA was significantly ( $p=0.006$ ) lower in SSc patients with late pattern [4.2 (2.5–5.3)] than SSc patients with other patterns. PhA was significantly ( $p<0.0001$ ) lower in SSc patients with digital ulcers (DUs) [4.2 (2.5–5.3)] than in patients without DUs [3.80 (2.50–5) vs 4.75 (2.80–7.3)].

**Conclusions:** VEGF levels in combination with PhA, NVC and DUs history could be useful to estimate cellular and microvascular damage in SSc patients.

**Disclosure of Interest:** None declared.

#### MON-PO499

##### FAT FREE MASS IS REDUCED IN FEMALE SYSTEMIC SCLEROSIS PATIENTS AND CORRELATES WITH DISEASE VARIABLES

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**Rationale:** Changes in nutritional status and body composition are frequently reported in Systemic Sclerosis (SSc) although their prevalence depends on the methods of assessment used. The aim of the study was to assess prevalence of sarcopenia in SSc patients and to evaluate possible correlations with activity and severity disease.

**Methods:** Adults patients with diagnosis of SSc admitted to our Scleroderma Unit were included in the study. Clinical status, disease activity index (DAI), disease severity scale (DSS), modified Rodnan skin score (mRSS), anthropometric data and bioelectrical impedance analysis-assessed (Inbody 770; USA) fat free mass index (FFMI) were recorded upon enrollment. For statistical analysis, Kruskal–Wallis or Student's test for continuous variables, Chi-square or Fisher's exact test for categorical variables and multiple regression analysis to evaluate correlation between continuous variables, were used.

**Results:** Eighty-six female SSc patients were enrolled (mean age 55 ±14 years, BMI 24.3 ± 4.1 kg/m<sup>2</sup>). Mean values of mRSS and disease duration were 11 ± 7 and 11.7 ± 8 years. Mean FFMI was 16.7 ± 2 kg/m<sup>2</sup>. Patients were stratified according to FFMI: ≥15 kg/m<sup>2</sup> (n = 68) and FFMI <15 kg/m<sup>2</sup> (n = 18). In group with reduced FFMI the median value of disease duration [12 (10–18) vs 9 (8–11),  $p<0.01$ ], mRSS [18 (10–22) vs 6 (6–8),  $p<0.01$ ] and DSS [7 (2–4) vs 3 (2–4),  $p<0.001$ ] were significantly higher than in SSc with normal FFMI. Age was not

different between the two FFMI groups. In multiple regression analysis, a negative correlation was observed between FFMI and disease duration ( $p<0.05$ ,  $r=-0.37$ , beta coefficient -0.23), when adjusting for age.

**Conclusions:** FFMI is reduced in female SSc patients with long disease duration and high score of skin fibrosis. In addition, patients with reduced FFMI show a negative correlation with DSS.

**Disclosure of Interest:** None declared.

#### MON-PO500

##### NUTRITIONAL STATUS OF 24,534 CANCER PATIENTS WITH OR WITHOUT DIABETES MELLITUS—RESULTS FROM INSCOC STUDY

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**Rationale:** The study aimed to characterize the nutritional status of cancer patients with diabetes as compared with those without diabetes, using diverse methods of nutritional assessment.

**Methods:** 24,534 patients with cancer were prospectively enrolled from 72 hospitals in China. A series of parameters were investigated to provide global estimation of nutritional status. Patients were subdivided into diabetes mellitus (DM) and non-DM groups and inter-group comparison was made using Chi-square test and t-test.

**Results:** The incidence of diabetes was 7.0% in the whole population. In comparison with non-DM group, DM group had greater body weight (63.12 kg vs. 59.83 kg,  $p<0.001$ ), similar level of fat-free mass (46.27 vs. 45.63,  $p=0.177$ ) yet lower handgrip (23.61 N vs. 24.81 N,  $p<0.001$ ). DM group exhibited markedly decreased level of pre-albumin (99.22 mg/L vs. 113.30 mg/L,  $p<0.001$ ) and albumin (38.64 g/L vs. 39.28 g/L,  $p=0.022$ ) and higher level of C-reactive protein (23.52 mg/L vs. 18.60 mg/L,  $p=0.001$ ). Notably, increased PG-SGA (6.43 vs. 5.93,  $p<0.001$ ) and NRS2002 score (1.77 vs. 1.66,  $p=0.006$ ), as well as decreased Karnofsky score (82.60 vs. 85.74,  $p<0.001$ ) were observed in the DM group.

**Conclusions:** Cancer patients with diabetes had bigger body mass yet lower physical strength and poorer performance status, accompanied by decrease in the level of (pre)albumin and elevated CRP. Tailored nutrition intervention is necessary for this subpopulation considering its unique pattern of nutritional status.

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**Disclosure of Interest:** None declared.

### MON-PO501 HIGH PREVALENCE OF VITAMIN B12 DEFICIENCY BEFORE AND EARLY AFTER GASTRECTOMY IN PATIENTS WITH GASTRIC CANCER

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**Rationale:** Gastric acid and intrinsic factor from stomach are required for vitamin B12 (B12) absorption, and B12 deficiency is known to occur after gastrectomy (GTx), but several years later because of large amount of hepatic B12 storage. However, it may occur much earlier, since most gastric cancer occurs in patients (pts) with atrophic gastritis and B12 malabsorption may exit before surgery. In this paper, we have tested this hypothesis.

**Methods:** Subjects were 23 and 50 pts before and after GTx, respectively. They were evaluated for their blood B12, folate, homocysteine levels, parameters of anemia, and nutrients intake using a questionnaire. Informed consent was obtained.

**Results:** B12 concentration was decreased in both groups, and significantly lower in pts after GTx (median; 201.5 pmol/L) than those before GTx (median; 253.1 pmol/L) ( $p = 0.044$ ). Prevalence of B12 deficiency (lower than 220 pmol/L) was 35% and 63% in pts before and after GTx, respectively, and the time from GTx to deficiency was within two years in 29% of pts after GTx. In pts after GTx, blood B12 and homocysteine concentrations were significantly negatively correlated ( $r = -0.541$ ,  $p = 0.046$ ). Also, serum B12 and ferritin concentrations were lower in pts with anemia than in those without it ( $p = 0.003$ ,  $p = 0.061$ ), suggesting the coexistence of these nutrients deficiency.

**Conclusions:** B12 deficiency occurs in pts before and early after GTx. Malabsorption of B12 and iron both occur after GTx, and they often coincide. Although mean corpuscular volume (MCV) is increased and decreased in the former and latter, respectively, it may not be altered in their co-existence due to counteraction. B12 deficiency is likely to be overlooked since B12 is not routinely measured. In conclusion, B12 deficiency is prevalent in gastric cancer pts before and early after GTx, and more attention should be paid on B12 status.

**Disclosure of Interest:** None declared.

### MON-PO502 SEVENTY-FIVE-GRAM ORAL GLUCOSE TOLERANCE TEST USING A FLASH GLUCOSE MONITORING SYSTEM

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**Rationale:** A flash glucose monitoring (FGM) system, which continually measures glucose concentrations in interstitial fluid, has made it possible to conveniently detect glycemic variations. The purpose of this study was to compare venous plasma glucose (PG) levels with interstitial glucose levels measured using the FGM (FGM-IG) system during an oral glucose tolerance test (OGTT) in men and women.

**Methods:** Fifty-two healthy volunteers (25 men and 27 women; mean age, 48.6 years) were recruited in annual health checkups. The FreeStyle Libre Pro<sup>®</sup> sensor was inserted on the back of each upper arm between 11:00 a.m. and 1:00 p.m. on the first day, and PG and serum insulin levels were measured during 75-g OGTTs (at 0, 60, and 120 minutes) on the second day after an overnight fast. A total of 75 PG levels for men and 81 PG levels for women were paired with FGM-IG

levels simultaneously. We also measured height, body weight, waist circumference (WC), and glycated hemoglobin (HbA1c) levels and calculated body mass index (BMI) and homeostatic model assessment insulin resistance (HOMA-IR). The relationships among PG, FGM-IG, and these relative parameters were investigated. Informed consent was obtained from each subject.

**Results:** There were significant and strong correlations between PG and FGM-IG for men ( $r = 0.863$ ,  $P < 0.001$ ) and women ( $r = 0.759$ ,  $P < 0.001$ ). Consensus error grid analysis indicated that all FGM-IG levels were within Zones A (no effect on clinical action) and B (altered clinical action – little or no effect on clinical outcome). The mean absolute differences (MADs) were 15.1 mg/dL and 13.9 mg/dL for men and women, respectively. The mean absolute relative differences (MARDs) were 12.2% and 13.3% for men and women, respectively. The MAD and MARD were not affected by factors such as age, BMI, WC, HbA1c level, or HOMA-IR. Based on PG, 15 and 20 subjects were diagnosed with normal glucose tolerance, 9 and 7 had impaired glucose tolerance, and 1 and 0 had diabetes mellitus among men and women, respectively. Based on FGM-IG, over 90% of subjects displayed the same diagnosis based on PG.

**Conclusions:** FGM-IG reflected PG, and it was suggested that FGM was useful in the 75-g OGTT. Further studies are needed to clarify factors affecting interstitial glucose levels.

**Disclosure of Interest:** None declared.

### MON-PO503 NUTRITIONAL RISK AT ADMISSION ACCORDING TO HOSPITAL WARD AND ITS RELATION WITH MORTALITY: ANALYSIS OF 67,210 CASES

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**Rationale:** The aim of this study was to assess the association between nutritional risk at hospital admission according to the ward where the patients were hospitalized and its relation with mortality.

**Methods:** An ambispective longitudinal and comparative study was conducted in patients consecutively admitted at all the wards of the Hospital General de México in a two year period. Nutritional Risk Screening tool (NRS-2002) was applied within 24–48 hours of hospital admission. Nutritional risk prevalence, relative risk and mortality were calculated for each ward. Chi-square test was performed to compare relative risk in different wards and we calculate mortality rate in each ward per year.

**Results:** Prevalence of nutritional risk was 18.87% in the screened population ( $n = 67,210$  patients) at hospital admission. Patients hospitalized with diseases related to the nephrology ward had the highest nutritional risk 86.1% (RR 4.8); followed by the geriatric 74.5% (RR 4.1), oncology 55.6% (RR3.7) neurology and neurosurgery ward 53.7% (RR 2.9). Infectiology ward was the one with the highest mortality rate (98.5 per 1,000 people) during the two year period, followed by neurology, neurosurgery (39.47) and oncology (34.76) compared with all wards.

**Conclusions:** Nutritional risk prevalence at hospital admission had a strong relationship with the ward where the patient will be admitted to. Patients with high nutritional risk had a significant association with mortality according to the hospital ward of admission. Been a patient with diseases related to the nephrology, geriatric and oncology wards have the highest risk of malnutrition associated with mortality rate. Therefore, nutritional monitoring and trained personnel are required in those areas. Further research should explore the use of nutrition screening and intervention before, during, and after hospitalization at each ward to ensure an appropriate nutrition intervention.

**Disclosure of Interest:** None declared.



### MON-PO504 PHYSICIANS' ATTITUDES TOWARDS MEDICATION RELATED NUTRITION DISORDERS

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**Rationale:** Medications that affected the intake, digestion, absorption, storage, metabolism and elimination of nutrients can cause medication related nutrition disorders (1). The aim of this study was to evaluate the attitudes of physicians against medications that may cause malnutrition, insufficient nutrition, sarcopenia, weight loss, and micronutrient disorders.

**Methods:** A questionnaire consisting of 14 questions was applied to the physicians attending to the 'Medication Related Nutrition Disorders' titled seminar within the scope of Adult Nutrition Support Unit Curriculum in 15<sup>th</sup> January 2019 by obtaining written consent on the basis of voluntariness. We used the 3-point Likert scale (Agree, Indecisive, Disagree) before and after the training.

**Results:** A total of 30 physicians with a median age of 34 years (23–59 years) and 19 (63.3%) women participated in the survey. While 24 (80.0%) of the physicians are specialists, 6 (20.0%) of them are assistants and the median of period of service in profession is 13 years (range: 1–36 years). The distribution of the services of physicians were as follows; intensive care unit (n=11, 36.7%), pediatric gastroenterology (n=9, 30.0%), geriatrics (n=7, 23.3%) and general surgery (n=3, 10.0%). It was the question that 'Medications that cause no taste or metallic/bitter taste affect the nutritional status of the patients' has been the most common answer to the 'Disagree' (6.67%). It was the questions that 'Vitamin B<sub>12</sub> plasma levels should be monitored in patients prescribing metformin' and 'Vitamin D plasma levels should be monitored in patients prescribing phenytoin' has been the most common answer to the 'Indecisive' (23.33% and 23.33% respectively). There was a statistically significant change in the response to both questions after the training (*p*: 0.011 and *p*: 0.008 respectively).

**Conclusions:** Although the awareness of physicians about medication related nutrition disorders is generally high, it has been observed that the training contributed to improve the knowledge level. There is a need for studies evaluating reflection to the physicians' clinical practices of this theoretical attitude.

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**Disclosure of Interest:** None declared.

### MON-PO505 NUTRITIONAL ASSESSMENT OF A POPULATION IN TURKANA, KENYA: A PILOT STUDY.

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**Rationale:** The Spanish project 'Surgery in Turkana' works since 2004 improving health status of Turkana population in the North of Kenya. The objective of this study was to perform a nutritional assessment on the population attended at Lodwar District Hospital during the Surgical Campaign of February 2018.

**Methods:** Observational cases-series study. Ethical Committee of HCSC approved the study. **Demographic and clinical data** were collected: gender, age, location (rural/town), Turkana region, educational level, acute/chronic illness, comorbidities, weight loss. **Anthropometric data:** weight, height, middle upper arm circumference, tricipital skin fold, grade of edema, fat and muscle loss (physical exam), muscular strength (dynamometer). **Body composition data** by bioimpedance (BIA Akern101). **Estimated coverage of caloric requirements. Diagnosis of malnutrition:** body mass index (BMI) and ASPEN criteria in adults (>17 years-old).

**Results:** 218 patients were evaluated (48.2% males, 52.8% females). Median age 33.5 years-old [17–48]. 80% from rural areas. Data about weight loss remain unknown in most of the patients. Significant differences were found between rural and urban population regarding all the anthropometric data and most of the body composition data. Using ASPEN criteria, 85.2% of males and 82.2% of females from rural area were diagnosed of malnutrition vs 28.6% in males and 22.7% in females from urban area. 65% of males and 64% of females from rural area had BMI<18.5 vs 28.6% in males and 9.1% in females from urban area.

**Conclusions:** High prevalence of malnutrition was detected in Turkana population. However, diagnostic criteria for malnutrition in hospitals of undeveloped countries are not well established. Studies are required to find the most accurate criteria adapted to these scope.

**Disclosure of Interest:** None declared.

### MON-PO506 GLOBAL LEADERSHIP INITIATIVE ON MALNUTRITION (GLIM) CRITERIA FOR DIAGNOSIS OF DISEASE RELATED MALNUTRITION IN A HOSPITAL FROM THE AFRICAN CONTINENT. A CALL TO ACTION

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**Rationale:** The objective of this study was to describe the prevalence of malnutrition with the GLIM criteria in a sample of population at Lodwar District Hospital (Turkana, Kenya) and to analyse the diagnosis agreement using two cut-off points for BMI and three strategies to measure muscle mass (MM).

n(%)	Rural		Urban	
	Men (n=54)	Female (n=73)	Men (n=14)	Female (n=22)
Glim1 (BMI <18.5 kg/m <sup>2</sup> and FFMI <15/17 kg/m <sup>2</sup> )	n=38 24 (63.2)	n=50 38 (76)	n=5 3 (60)	n=9 3 (33.3)
Glim2 (BMI <20 kg/m <sup>2</sup> and FFMI <15/17 kg/m <sup>2</sup> )	n=44 30 (68.2)	n=57 45 (78.9)	n=9 5 (55.6)	n=9 3 (33.3)
Glim3 (BMI <18.5 kg/m <sup>2</sup> and low clinical muscle mass)	n=46 29 (63.0)	n=61 42 (68.9)	n=12 3 (25.0)	n=20 0 (0.0)
Glim4 (BMI <20 kg/m <sup>2</sup> and low clinical muscle mass)	n=46 30 (65.2)	n=61 44 (72.1)	n=12 5 (41.7)	n=20 0 (0.0)
Glim5 (BMI <18.5 kg/m <sup>2</sup> and low hand grip strength)	n=46 31 (67.4)	n=61 43 (70.5)	n=12 5 (41.7)	n=20 4 (20.0)
Glim6 (BMI <20 kg/m <sup>2</sup> and low hand grip strength)	n=46 32 (69.6)	n=61 46 (75.4)	n=12 6 (50.0)	n=20 4 (20.0)

**Methods:** Two levels of BMI (<18.5/<20.0 kg/m<sup>2</sup>) and 3 tools of MM measure (FFMI <15 for female, <17 for male -Akern<sup>®</sup> bioimpedance-, clinical evaluation and hand grip strength <16 kg for female, <27 kg for

male -JAMAR® dynamometer-) were used to define malnutrition phenotypic GLIM criteria. Weight evolution was unknown. Six diagnosis approaches were tested with the combinations of those criteria.

**Results:** Total sample 163 (rural M/F: 54/73; urban M/F: 14/22). The malnutrition prevalence is shown in the table.

The value of kappa for agreement was: GLIM 1–3/1–5/3–5: 0.897/0.894/0.845; GLIM2–4/2–6/4–6/: 0.937/0.952/0.889.

**Conclusions:** GLIM criteria could be used for the diagnosis of malnutrition in hospitals from the African continent, taking into account special considerations.

**Disclosure of Interest:** None declared.

#### MON-PO507

##### DIFFERENCES IN BODY COMPOSITION PARAMETERS ESTIMATED BY BIOELECTRICAL IMPEDENCE DEVICE BETWEEN THE AFFECTED AND UNAFFECTED SIDE OF THE BODY IN STROKE PATIENTS

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**Rationale:** In everyday clinical practice and some literature,<sup>1</sup> the body composition parameters estimated by a bioelectrical impedance device on the unaffected side of the body in stroke patients seems to be better (lean body mass is usually a bit higher) than parameters on the affected side. The aim of the study was to prove that the selection of the side is important, as measurements on the unaffected side can underestimate the actual state.

**Methods:** Bioelectrical impedance analysis on both sides of the body was performed in 46 stroke patients who were admitted to the University Rehabilitation Institute, Republic of Slovenia and the Institute Auxologico Italiano between October 2013 and May 2014. Differences in body composition parameters on the affected and unaffected sides were tested using independent t-test. When comparing the two sides, the following criteria were taken into account: the time interval between the stroke and the admission to the rehabilitation institute, the spasticity of the affected side, oedema and dysphagia.

**Results:** There was no statistically significant difference in estimate fat free (mean difference 0,4; *p*-value 0,3516) and lean body mass (mean difference 0,337; *p*-value 0,3581) between the affected and the unaffected side. On the contrary, there was a statistically significant difference in the phase angle (mean difference 1,1; *p*-value <0,001). More than half of the patients (59%) had spasticity and 37% had oedema on the affected side. The mean time interval between the stroke and the admission to the rehabilitation institute was 294 days (SD: 487,4; 3–2567 days).

**Conclusions:** Since the phase angle is one of the most reliable indicators of the nutritional state of the body,<sup>2</sup> and since the study has shown that the values on the affected side are significantly lower, we have decided to perform bioelectrical impedance analysis in stroke patients on the affected side of the body (if possible). This way, we try to avoid underestimation and misinterpretation of the results and consequently inappropriate use of different clinical interventions to prevent malnutrition.

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**Disclosure of Interest:** None declared.

#### MON-PO508

##### ANALYSIS OF OUTCOMES OF THE NRS 2002 QUESTIONNAIRE IN PATIENTS HOSPITALIZED ON NEPHROLOGY WARDS

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**Rationale:** Malnutrition is a common problem among hospitalized patients, there is a need for rapid and effective identification of patients at risk of malnutrition in order to introduce the appropriate prevention and /or nutritional intervention. One of the tools is quick and easy to perform a questionnaire NRS-2002 (Nutritional Risk Scale).

**Methods:** The aim of the study was to test the effectiveness of NRS-2002 in the assessment of malnutrition patients hospitalized in nephrology. The objective was to also an attempt to clinical characteristics of the malnourished patients and assessment the relationship between nutritional status and sometimes hospitalization.

**Results:** The analysis included 292 patients (K = 135 M = 157), median age was 60 (IQR = 17) years. The average BMI was equal to 24.6 (IQR = 7.4). The median of duration of hospitalization 9 (IQR = 8) days. Among the respondents in 119 patients (40%) had malnutrition (NRS ≥ 3). Group of undernourished people was characterized by a statically significant lower BMI (23.4, IQR = 6,4 vs 25.6, IQR = 6 = 7,3 *p* = 0.0000), a more advanced age (73, IQR = 20 vs 54, IQR = 22 years; *p* = 0.0000), lower serum albumin (26, IQR = 9 vs 32.5, IQR = 7.3 g/l, *p* = 0.0000), and almost twice longer duration of hospitalization (13, IQR = 14 vs 7, IQR = 5 days, *p* = 0.0000). In multiple regression analysis, the presence of malnutrition assessed the scale of the NRS-2002 proved to be an independent predictor of the duration of hospital stay (*b* = 11.2, *p* <0.001).

**Conclusions:** The questionnaire NRS-2002 is a simple and useful tool to determine malnutrition. Results of the analysis indicate a high prevalence of malnutrition among patients hospitalized in nephrology, as well as on the impact of this complication on the length of hospitalization. Identification of malnourished patients with NRS-2002 will allow the implementation of appropriate nutrition intervention helping to improve outcomes in hospitalized patients.

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**Disclosure of Interest:** None declared.

#### MON-PO509

##### THE UNDER-NUTRITION RISK IN HOSPITALIZED MALAYSIAN CHILDREN: USE OF 3-MINUTE NUTRITION SCREENING-PAEDIATRIC (PAEDIATRIC 3-MINNS)

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**Rationale:** In Malaysia, implementation of any nutrition screening tools was not a routine pediatric clinical practice. There was also limited information on under-nutrition proportion among hospitalised children in Malaysia. The study aimed to evaluate the under-nutrition rate of children who admitted to the paediatrics wards of a tertiary teaching hospital, a tertiary general hospital and a district hospital using the validated Paediatric 3-MinNS.

**Methods:** This cross-sectional study with 284 patients aged 2–12 years was conducted in the paediatrics wards of Kuala Lumpur Hospital Paediatrics Institute (KLHPI), University Malaya Medical Centre (UMMC), and Hospital Sultanah Nora Ismail (HSNI), Batu Pahat, Johor. Convenience sampling of paediatric patients who admitted within 24–72 hours was recruited. All staff nurses at these centres were given the trainings on using Paediatric 3-MinNS as the nutrition screening tool. Social-demographic, anthropometric and clinical data was recorded. All statistical analyses were done with SPSS software, version 20.0, appropriate statistical tests were been carried out to determine the relationship between the variables.

**Results:** The Paediatric 3-MinNS performed by the staff nurses identified 25.4% of participants as being at high under-nutrition risk. The highest proportion of participants with high under-nutrition risk was found at HSNI (33%), followed by KLHPI (26.4%), and UMMC (15%). When referred to the WHO criteria, 5.4% of the participants with high under-nutrition risk assessed by the Paediatric 3-MinNS had severe acute malnutrition, 9.7% had severe chronic malnutrition, and 11.1% were severe thinness according to the BMI-for-age. There were 32.9% participants with high risk score had the length of hospital stay more than 5 days.

**Conclusions:** Findings of this study supported the use of Paediatric 3-MinNS as the nutrition screening tool for hospitalised children in Malaysia. It is recommended that all hospitals adopt the policy to screen paediatric patients on admission for under-nutrition risk.

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#### MON-PO510

##### ENERGY AND PROTEIN INTAKE AFTER LIVER TRANSPLANTATION – A COMPARISON OF TWO NUTRITIONAL PROTOCOLS

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**Rationale:** Individual adjustment of nutrition based on monitoring of energy and protein intake in patients undergoing liver transplantation (LTx) is important to promote enhanced recovery and to reduce postoperative complications. The aim of this study was to evaluate two nutritional protocols and its effect on protein intake during the first seven days after LTx.

**Methods:** Between September 2017–December 2018, adults patient undergoing LTx in our center, where daily monitored for total energy and protein intake during the first week after LTx. Patients with at least 3 days monitoring were included in the study. Protocol A (pA) was based on enteral nutrition (EN) provided from postoperative day 1–4; protocol B (pB) involved a faster rate and higher volume of EN and additional high protein oral nutritional supplements (ONS). Besides nutritional pA or pB, patients consumed food according to individual tolerance. Mann-Whitney, t-test and chi-square test was used for statistical analysis.

**Results:** Seventy patients were included in the study. During the first postoperative week, patients with pB had a higher protein intake (95 g vs 77 g) and covered a higher proportion of estimated protein needs (80% vs 70%)

**Table 1**

Protein and energy intake.

Factor	All (n = 70)	A (n = 34)	B (n = 36)	p-value
Energy intake kcal/d, mean (SD)	1901 (438)	1795 (440)	1995 (426)	0.062
Intake in % of estimated energy needs/d, mean (SD)	84 (19)	80 (17)	88 (20)	0.088
Covering > 70% of energy needs, n (%)	53 (76%)	24 (73%)	29 (81%)	0.441
Protein intake gram/d, median (IQR)	81 (33)	77 (19)	95 (35)	<0.01
Intake in % of estimated protein needs, median (IQR)	78 (22)	70 (27)	80 (30)	<0.05
Covering > 70% of protein needs, n (%)	45 (64%)	17 (50%)	28 (78%)	<0.02

**Conclusions:** A nutritional protocol including higher rate of EN and high protein ONS (pB) resulted in a higher protein intake early after LTx. Effect of higher protein intake on post LTx complications will be studied.

**Disclosure of Interest:** None declared.

#### MON-PO511

##### A NEW EQUATION USING KNEE HEIGHT TO PREDICT OVERALL HEIGHT AMONG OLDER PEOPLE IN SUB-SAHARAN AFRICA.

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**Rationale:** Predictive formula for height using knee height (pHt) are useful among people aged over 60 years who cannot get upright. However, they were developed in caucasians and African-Americans but not for older native Africans. With the increase of nutritional epidemiologic studies in African older people it is therefore important to have a validated formula for this population. We therefore aimed to propose a new validated formula in older people in sub-Saharan Africa, ii) to study the nutritional status according to the body mass index (BMI) with measured height (mHt) and pHt.

**Methods:** mHt and pHt were measured in a population of people over 65 years old from the Republic of Congo (ROC), Central African Republic (CAR) and Benin. A new formula was created for older people of ROC and CAR after randomization in a derivation sample (n = 877) and assessed for accuracy in a validation sample (n = 877). We also tested this new formula in older people of Benin. The percentages of accurate predictions ( $\pm 5$  cm) were compared between mHt and pHt



with the new formula and Chumlea's formulas for the American black population (CBP). Chi2 and Mann-Whitney test was also used.

**Results:** We included 880 older people in ROC, 874 in CARand 220 in Benin. There was no significant difference between characteristics of the derivation sample and the validation sample. The new formula significantly increases accuracy (71.3%) and decreases overestimation (14.7%) compared to CBP (65.3%,  $p=0.008$  and 25.9%,  $p<0.0001$ , respectively) in validation sample. In Benin, the new formula gave the same accuracy than CPB (81.8% vs.83.3%;  $p=0.71$ ), however it decreased overestimation (4.6% vs.11.8%;  $p=0.005$ ). Moreover, there was no significant difference in BMI calculated with the mHt and the pHt with our new formula, and the nutritional status based on BMI did not differ.

**Conclusions:** The formula that we propose more accurately estimates height in older native Africans. Moreover, this formula overestimates less the height of older people. It could be useful for future epidemiological studies but also in clinical practice.

**Disclosure of Interest:** None declared.

#### MON-PO512

##### MALNUTRITION KNOWLEDGE, ATTITUDES, AND PRACTICES IN DUTCH HOSPITAL PROFESSIONALS FROM A REGIONAL DUTCH HOSPITAL

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**Rationale:** Prevention and treatment of malnutrition requires adequate knowledge of (mal)nutrition among healthcare professionals involved in the nutrition care process. In this study, we aimed to assess the level of nutrition knowledge, attitudes, and practices in hospital healthcare professionals.

**Methods:** The Nutrition knowledge, attitudes, and practices as perceived by the healthcare professionals (i.e., physicians, nurses, dietitians, speech therapists, and physical therapists) were assessed, using the validated Malnutrition (M) Knowledge (K), Attitudes (A), and Practices (P) (M-KAP) questionnaire. Participants were asked to score 1–5 points per KA statement, and 1–4 points per P statement. Total M-KAP score was calculated by adding the KA scores to the P scores. Maximum scores for KA and P were 100 and 28, respectively.

**Results:** 39 professionals (24% response rate, 32 nurses, 6 physical therapists, and 1 speech therapist) completed the M-KAP questionnaire, of which 92% was female, 73% was aged  $\geq 40$  years, 59% worked at the surgery department, 36% at the lung disease and cardiology department. Mean total scores were  $75.3 \pm 5.5$  for KA,  $18.3 \pm 3.3$  for P, and  $93.6 \pm 7.7$  for total KAP. In total, 87% at least somewhat agreed that malnutrition is a high priority at the hospital, 79% stated to have an important role in promoting food intake, 21% somewhat disagreed with the statement that all patients should be screened at hospital admission, and 41% stated to somewhat agree to needing more training to better support the nutrition needs of the patients. More than half of the participants did not encourage patient's family to bring food from home (51%). Moreover, 51% stated to often/always visit and check a patient during their meal time to see how well they are eating. Only 10% stated to often provide the patient or family with nutrition education materials.

**Conclusions:** Hospital staff finds nutrition support important, but also addresses the need for more training to better support nutrition needs of their patients.

**Disclosure of Interest:** None declared.

#### MON-PO4513

##### PREDICTIVE VALUE OF GLIM CRITERIA FOR DIAGNOSING MALNUTRITION ON HOSPITAL LENGTH OF STAY IN SELECTED CLINICAL POPULATIONS

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**Rationale:** We aimed to assess the predictive value of the Global Leadership Initiative on Malnutrition (GLIM) criteria on length of hospital stay (LOS).

**Methods:** Data were collected in patients from the surgery, urology, lung disease, and cardiology wards of a Dutch hospital, <72 h after hospital admission. MalnutritionGLIM was assessed by using the Patient-Generated Subjective Global Assessment and bioelectrical impedance analysis, and was defined as having  $\geq 1$  phenotypic criterion: weight loss (WL), low body mass index (BMI), or reduced muscle mass (MM), and  $\geq 1$  etiologic criterion: reduced food intake/assimilation (RI) or inflammation/disease burden (IF). Difference in LOS between malnourished and well-nourished patients was assessed with the Mann-Whitney U test. Predictive value of the GLIM criteria was determined with generalized linear regression, correcting for the confounders age, gender, diagnosis, and Charlson comorbidity index. The GLIM criterion 'low BMI' was not corrected for age, since this criterion already includes specific age ranges.

**Results:** In total, 455 patients were included ( $65 \pm 15$  years, 55% male), of which 47% were categorized as having malnutritionGLIM (Table 1). While significantly predicting LOS in the univariate analysis (1.1 d longer LOS,  $p=0.033$ ), malnutritionGLIM did not significantly predict LOS after correction for possible confounders. However, specific combinations, i.e., WL+RI ( $\Delta 1.1$  d), WL+IF ( $\Delta 1.3$  d), and BMI+IF ( $\Delta 1.6$  d) significantly predicted LOS.

**Table 1**

Presence of GLIM criteria and difference in length of stay.

GLIM criteria	Yes N (%)	$\Delta$ LOS days	$p$ -value*	$\Delta$ LOS days	$p$ - value**	$p$ - value***
GLIM	212 (47%)	1.2	$p=0.033$	1.1	$p=0.064$	
WL	54 (13%)	1.2	$p=0.095$	1.2	$p=0.070$	
BMI	23 (5%)	1.5	$p=0.010$	1.6		$p=0.002$
MM	218 (48%)	1.2	$p=0.018$	1.1	$p=0.219$	
RI	66 (15%)	1.2	$p=0.069$	1.2	$p=0.109$	
IF	345 (76%)	1.2	$p=0.032$	1.1	$p=0.129$	
WL+RI	18 (4%)	1.6	$p=0.007$	1.6	$p=0.010$	
WL+IF	45 (11%)	1.3	$p=0.042$	1.3	$p=0.022$	
BMI+RI	4 (1%)	1.2	$p=0.553$	1.4	$p=0.340$	
BMI+IF	21 (5%)	1.5	$p=0.023$	1.6	$p=0.006$	
MM+RI	40 (9%)	1.2	$p=0.111$	1.1	$p=0.270$	
MM+IF	187 (41%)	1.2	$p=0.008$	1.1	$p=0.082$	

LOS = length of stay, WL = weight loss, BMI = body mass index.

MM = reduced muscle mass, RI = reduced intake/assimilation, IF = inflammation.

\*Univariate model.

\*\*Corrected for age, gender, diagnosis, co-morbidity.

\*\*\*Corrected for gender, diagnosis, co-morbidity.

**Conclusions:** In selected clinical populations, the predictive value of variants of GLIM criteria for LOS is most significant for the less prevalent weight loss and reduced intake combination, but not significant for the highly prevalent reduced muscle mass with any etiologic criteria combination. Further insight in predictive value of the GLIM criteria in other populations is needed.

**Disclosure of Interest:** None declared.

#### MON-PO514

##### THE EFFECT OF A TAILORED INTERDISCIPLINARY STRATEGY TO IMPLEMENT THE PG-SGA SHORT FORM IN THE HOSPITAL SETTING: THE FIRST RESULTS FROM THE STREAM IMPLEMENTATION STUDY

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**Rationale:** The Dutch hospital Nij Smellinghe is implementing the Patient-Generated Subjective Global Assessment Short Form (PG-SGA SF) for nutritional screening. Insight is needed in how implementation of this instrument affects the number of referrals to the various professionals involved in the nutritional care process, and their treatment plans. We aimed to evaluate the progress of the interdisciplinary malnutrition prevention and treatment strategy to implement the PG-SGA SF and subsequent start of tailored interventions in Nij Smellinghe within the STREAM (Strategy to proactively screen, assess, prevent, and treat malnutrition) implementation study.

**Methods:** The implementation strategy was developed in co-creation with the hospital staff, using the Knowledge-to-Action process. Patients from the wards lung disease, cardiology, surgery, and urology completed the PG-SGA SF <24 h after admission. Patients completed the boxes on weight history, food intake, nutrition impact symptoms (NIS), and activities/function. Dietitian referral results from  $\geq 2$  points on weight loss and/or food intake. Physiotherapist referral was set at  $\geq 2$  points on activities/function. Patients reporting  $\geq 1$  of the NIS nausea, constipation, mouth sores, pain, vomiting, diarrhea, dry mouth, fatigue, or 'other NIS' were referred to the nurse. Patients reporting 'problems swallowing' were referred to the speech therapist.

**Results:** Between November 2018–March 2019, 788 of 1162 admitted patients (68%) were screened with PG-SGA SF. Of the screened patients, 29% were referred to the dietitian, 30% to the physiotherapist, 5% to the speech therapist, and/or 32% to the nurse. The dietitian started treatment in 31%, but did not treat 51% of the PG-SGA SF-based referred patients, and had already started treatment in 18%. The physiotherapists started treatment in 32%, but did not treat 33%, and had already started treatment in 35%. Main reasons for both professional groups for not starting treatment were: patient already discharged ( $n = 32$ ; 27%), no time to visit the patient (due to extra work load) ( $n = 43$ ; 36%). The speech therapist started treatment in 72% of the PG-SGA SF-based referred patients, but did not so in 28% due to unconfirmed swallowing problems. Nurses started treatment in 25% of the referred patients, but did not so in 58% (reasons mostly unknown), and had already started treatment of NIS in 17%.

**Conclusions:** Thus far, the STREAM implementation study resulted in an acceptable screening rate. To improve the implementation progress, the low cut off scores for referral to the various professionals will be further evaluated and may require revision.

**Disclosure of Interest:** None declared.

#### MON-PO515

##### ANTHROPOMETRIC INDICATORS AND BODY COMPOSITION IN CHILDREN WITH CEREBRAL PALSY

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**Rationale:** Children with cerebral palsy (CP) are at high risk for the development of nutritional status disorders. Problems associated with feeding, the characteristic of muscle tone and GMFCS level have a great influence on the nutritional status of a child with CP. Timely diagnosis and correction this disorders can help increase the rehabilitation potential and quality of life of this children.

**Methods:** Our study included 43 children (22 girls and 21 boys) aged 2–17 years with spastic form of CP. Height, weight, and BMI were assessed using program WHO Anthro and WHO AnthroPlus. The body composition was measured using the bioelectric impedance (BIA).

**Results:** 12 children (28%) has GMFCS-I, 10 (23%) children has GMFCS-II, 3 children has GMFCS-III (7%), 15 children has GMFCS-IV (35%) and 3 children has GMFCS-V (7%). According to the results of anthropometry we revealed 20 underweight children (10/7/3 patients accordingly 1–2–3<sup>rd</sup> degree of the undernutrition) and 5 overweight children. According to data of BIA 12/20 underweight children (60%) has a decrease of active cell mass (ACM): 7/10–4/7–1/3 children with mild, moderate and severe undernutrition accordingly. Fat mass percent (FM%) in underweight children with CP was multidirectional and in all children with overweight FM% was increased. Mean phase angle (PA) value was  $5.59 \pm 1.06$ . Value  $< 5.4$  was in 13/43 children (30%): in 40% children with mild undernutrition and 57% children with moderate undernutrition. In 10/13 children a low value of PA was combined with a decrease in ACM. Despite normal anthropometric parameters we revealed altered body composition for example, isolated change of FM %, reduction in ACM or musculoskeletal mass and imbalance of lean and fat mass in 14 children.

**Conclusions:** Diagnosis and correction of nutritional disorders in children with CP presents new opportunities for providing comprehensive rehabilitation. Analysis of body composition allows to identify target groups for individual nutritional correction in children with CP.

**Disclosure of Interest:** None declared.

#### MON-PO516

##### MALNUTRITION RISK ASSESSMENT OF INPATIENTS WITH INFLAMMATORY BOWEL DISEASE

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**Rationale:** Disorders of digestion and intestinal absorption associated with disease activity and location of lesions, fear of eating and using irrational diets significantly increase the risk of undernutrition and the need for nutritional support in inflammatory bowel disease (IBD) patients.

**Methods:** 51 patients with Crohn's disease (CD; 24 women, 27 men) and 46 patients with ulcerative colitis (UC; 23 women, 23 men) were evaluated of nutritional status at the time of admission to the gastroenterology ward. According to NRS 2002 score points patients were divided into currently without risk ( $< 3$  points) and at risk ( $\geq 3$  points) of undernutrition.

**Results:** The risk of malnutrition occurred in 19 patients with CD (37.3%) and 19 patient with UC (41.3%). Analysis of the exact number of points obtained in the NRS 2002 showed that patients without indications for nutritional intervention in the majority had a score of 0, and among those requiring nutritional support greatest number of points (5 points) received 11 of the 38 patients. The result of  $\geq 3$  points was a consequence of the number of points obtained in the component responsible for the deterioration of nutritional status. There was no statistical significance of the incidence of undernutrition among patients in both groups ( $p = 0.683$ ) even after taking account of sex. The risk of malnutrition significantly prevailed in women with CD (13) which was not observed in relation to the gender of patients with UC (10 women, 10 men). The risk of malnutrition showed a significant association between disease activity: CD with CDAI ( $p = 0.00034$ ) and UC with Mayo ( $p = 0.00001$ ). The average total score assessing disease activity was significantly higher in patients at risk of malnutrition ( $p < 0.000001$ ): CDAI ( $240.50 \pm 83.21$ ) and MAYO ( $7.1 \pm 1.9$ ).

**Conclusions:** Disease activity both in CD and UC patients significantly increases the risk of malnutrition and the need for nutritional support. Malnutrition risk assessment should be an important component of therapy and treatment for IBD patients.

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**Disclosure of Interest:** None declared.

## MON-PO517

### RELATIONSHIP BETWEEN HANDGRIP STRENGTH AND BIOIMPEDANCE VARIABLES IN ITALIAN OBESE WOMEN

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**Rationale:** Hand Grip strength (HGS) is widely used in clinical practice to assess the impact of a variety of disorders on hand function. However, the relationship between HGS and both anthropometric and bioimpedance variables has not been studied in obese patients. The aim of this study is to evaluate this association in adult women with overweight and obesity (BMI > 25 kg/m<sup>2</sup>)

**Methods:** One hundred and six adult women (age range 18–65 y) (age  $37.3 \pm 13.4$  yrs, weight  $95.9 \pm 20.7$  kg, height  $160.8 \pm 5.6$  cm, BMI  $37.1 \pm 7.2$  kg/m<sup>2</sup>) participated in the study.

Grip strength for both arms was measured with a handgrip dynamometer and bioimpedance analysis was performed at 50 kHz (DS Medica) in all subjects.

The mean HGS was the average value of three handgrip measurements of the dominant hand.

The following variables were considered for the association with mean HGS:

- 1) general characteristics: age, height, weight, BMI;
- 2) BIA measures: bioimpedance index ( $\text{height}^2 / \text{resistance} = \text{BI index}$ ) and PhA (whole body, arm and leg).

Statistical analysis was performed using linear correlation and multiple regression analysis (SPSS vers. 18.0).

**Results:** Mean HGS was  $23.3 \pm 4.65$  kg, whole body phase angle was  $6.12 \pm 0.76$  degrees, arm phase angle  $4.41 \pm 0.73$  and leg phase angle was  $7.50 \pm 1.1$  degrees.

According to ESPEN definition on sarcopenia, we found that 24 patients (22.6%) had mean HGS < 20 kg.

HGS was significantly correlated (linear correlation) with height ( $r = .404$ ,  $p = 0.000$ ), age ( $r = -0.311$ ,  $p = 0.001$ ), weight ( $r = .228$ ,  $p = 0.019$ ) and among the general characteristic, and BI index ( $r = .240$ ,  $p = 0.013$ ) and arm phase angle ( $r = .199$ ,  $p = 0.040$ ) among BIA measures. When we performed the multiple regression analysis for general characteristics, height and age ( $r = .454$ ,  $SE = 4.18$  kg) were the more correlated parameters with HGS; when BIA measures are considered, only IB was included ( $r = .240$ ,  $SE = 4.53$  kg).

When both general characteristic and BIA measures are considered in the multiple regression analysis, we found that height and arm phase angle were the most correlated parameters ( $r = .468$ ,  $SE = 4.14$  kg).

**Conclusions:** Our preliminary findings show that height and arm phase angle seem the most correlated parameter with HGS in adult obese women.

**Disclosure of Interest:** None declared.

## MON-PO518

### RELATIONSHIP BETWEEN PHASE ANGLE, HANDGRIP STRENGTH AND BMI IN ITALIAN WOMEN

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**Rationale:** Both phase angle (PA) and handgrip strength (HGS) are considered as markers of nutritional status: phase angle decreases in different forms of malnutrition and it's also a predictor of survival, in several pathological conditions; HGS, being a useful functional capacity test for evaluating muscle strength in the general population, is a diagnostic tool for assessing malnutrition, overall nutritional risk and mortality. Aim of this study was to evaluate the association between PA and HGS in a sample of young women.

**Methods:** 476 females, age range 18–40 years, with BMI between 10 and 25 kg/m<sup>2</sup> consecutively undergoing a routine clinical nutritional counselling at the Clinical Nutrition Outpatient Unit, from 2015 to 2018 were included in this study. Grip strength for the right and left arms was measured with a handgrip dynamometer and bioimpedance analysis was performed at 50 kHz (DS Medica) in all subjects. The mean HGS was the average value of three handgrip measurements of the dominant hand.

Patient group were split into: BMI subgroup 1 <16 kg/m<sup>2</sup>, n.114 (age  $22.5 \pm 5.3$  y, weight  $37.2 \pm 4.5$  kg, BMI  $14.5 \pm 1.2$  kg/m<sup>2</sup>); BMI subgroup 2 = 16.0–18.5 kg/m<sup>2</sup>, n.171 (age  $21.3 \pm 5.5$  y, weight  $44.6 \pm 3.7$  kg, BMI  $17.2 \pm 0.7$  kg/m<sup>2</sup>); BMI subgroup 3 = 18.5–25 kg/m<sup>2</sup>, n.191 (age  $22.8 \pm 5.4$  y, weight  $54.8 \pm 5.9$  kg, BMI  $21.0 \pm 1.6$  kg/m<sup>2</sup>).

**Results:** both PA and mean HGS increased significantly with increasing BMI until group 3 (group 1:  $5.2 \pm 0.9$ , group 2:  $5.7 \pm 0.7$ , group 3:  $6.3 \pm 0.7$  degrees; group 1:  $18.4 \pm 4.6$ , group 2:  $20.6 \pm 4.8$ , group 3:  $23.3 \pm 5.3$  kg). When we performed the linear correlation between PA and HGS, we found a significantly decreasing correlation with increasing BMI (group 1:  $r = 0.417$ ,  $p = 0.00$ ; group 2:  $r = 0.324$ ,  $p = 0.000$ ; group 3:  $r = 0.308$ ,  $p = 0.000$ ).

**Conclusions:** Our preliminary findings shows that HGS and phase angle seems strongly associated with BMI groups in Italian young females in particular they are significantly correlated in underweight patients (Group 1 and 2). So they should be considered as good marker of nutritional status.

**Disclosure of Interest:** None declared.



### MON-PO519 CAN LIBRE PRO MONITOR POSTPRANDIAL HYPERGLYCEMIA AND DUMPING SYNDROME IN SEVERELY HANDICAPPED CHILDREN AND ADOLESCENTS WITH GASTROSTOMY?

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**Rationale:** Postprandial hyperglycemia/dumping syndrome owing to enteral nutrient absorption after gastrostomy (GS) is easier controlled by changing patients to blender meal consumption. However, this varies with cases. We monitor glucose levels by continuous glucose monitoring (CGM) systems. FreeStyle Libre Pro (FSL-Pro), which does not need calibrations, was released, and here, we determined its applicability in monitoring.

**Methods:** Fifteen patients with GS aged 7–20 years (male:female = 8:7) were recruited. FSL-Pro was installed for 14 days. In one case, the actual measured values were compared with monitored values. We also compared data tendencies with those from the same patients using the MiniMed CGM-Gold (MiniMed) system in 2012.

**Results:** One of 15 patients was not measured for unknown reasons. Two patients had hypoglycemia  $\leq 50$  mg/dL except during meals, but no symptoms were observed. The correlation coefficient of the measured and actual values was 0.82, and the coefficient of determination was 0.68. The error was  $27\% \pm 17.9\%$ , and there was a large difference of  $1.91\% \pm 2.16\%$  on MiniMed. The 113 measurements were 19 times (16.8%) lower than the measured values.

**Conclusions:** FSL-Pro has lower invasiveness without calibrations, and the sensor needle is half as short as 5 mm than that of MiniMed and for 1/50 of the cost for the device. However, the error occurrence of the sensor is very high. There was also a 27% difference between actual and measured data. As per the manual, the average of their relative difference is as high as 11.4%, possibly owing to the difference in function as monitoring long-term median levels using FSL-Pro and live glucose levels to decide on insulin pumping with calibrations 4 times/day using MiniMed. FSL-Pro may not be suitable for monitoring postprandial hyperglycemia/dumping syndrome.

**Disclosure of Interest:** None declared.

### MON-PO520 EVALUATION OF ENERGY EXPENDITURE, HORMONE LEVELS AND NUTRITIONAL STATUS OF PATIENTS WITH SLEEVE GASTRECTOMY

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**Rationale:** The aim of this study was to evaluate the energy expenditure, hormone levels and nutritional status of the patients at

the first, second and third months after laparoscopic sleeve gastrectomy (LSG).

**Methods:** This research performed on 20 female patients who had laparoscopic sleeve gastrectomy operation in the medical faculty of Erciyes University. Before the surgery, information about the demographic and health status of the individuals was obtained with the help of a questionnaire form. Body analysis and anthropometric measurement of these patient were performed. Mifflin-St Jeor equation is used for estimation of resting metabolic rate, physical activity level (PAL) of patients indicated with usage of the 24-hour physical activity record. The biochemical data of the patients recorded retrospectively from patient files. The Simplified Nutritional Appetite Questionnaire (SNAQ) form was used to determine the appetite score of the individuals. Three-day food consumption record of these patients analyzed by BeBiS program. Plasma total ghrelin levels were performed by immunoenzymatic (ELISA) method using commercial ELISA kit. These process repeated after the surgery following months of first, second and third. Post-surgical complications were also evaluated in postoperative term. The SPSS 25.0 used for analysis of the data.

**Results:** Body weight, BMI, body fat percentage and amount, body lean tissue mass, total body water, waist, hip and neck circumference measurements of the patients decreased in the postoperative term ( $p < 0,05$ ). While the resting metabolic rate (DMH) of the patients decreased; physical activity level (PAL) and total energy expenditure (TEH) increased during the follow-up period ( $p < 0,05$ ). The fasting blood glucose level decreased in the monitoring term and this decreasing is correlated with the percentage of weight loss ( $r = -0,472$ ;  $p < 0,05$ ). The level of serum triglyceride, AST, ALT decreased despite to serum albumin, vitamin B12, magnesium, potassium, calcium and phosphorus increased in the postoperative term ( $p < 0,05$ ). Serum TSH levels decreased in the first and second months after surgery ( $p < 0,05$ ), there was an increase in the postoperative third month, but this difference was not significant ( $p > 0,05$ ). Plasma ghrelin hormone decreased during follow-up and there was a significant and negative correlation between plasma ghrelin levels and total protein and animal protein intake ( $r = -0,569$ ;  $p < 0,05$ ). The patients' appetite score decreased in the first postoperative month ( $p < 0,05$ ) and the increase after the first month was not significant ( $p > 0,05$ ). Total of energy, dietary fiber, carbohydrate and micronutrient intake decreased in the postoperative term ( $p < 0,05$ ). Even protein and fat intake decreased with diet, the percentage of protein and fat energy increased ( $p < 0,05$ ). At the first postoperative month, 30% of the patients reported nausea, 10% vomiting, 15% diarrhea, 70% constipation and 75% fatigue. At the third postoperative month, 30% of the patients reported nausea, 15% vomiting, 10% diarrhea, 45% constipation and 70% hair loss.

**Conclusions:** There were positive changes in anthropometric measurements, biochemical parameters and activity levels of patients, however energy, macro and micronutrient intakes decreased after LSG. In this study, only correlation detected between ghrelin and protein intake. It was thought that the decrease in ghrelin level may be effective on weight loss by increasing protein intake. Besides; at postoperative period patients may have some complications that had to be checked for a long-term.

**Table** (abstract: MON-PO520):

	Periods				p
	Preop ± SS	Postop 1. Month ± SS	Postop 2. Month ± SS	Postop 3. Month ± SS	
BMI (kg/m <sup>2</sup> )	46,95 ± 5,74 <sup>a</sup>	42,21 ± 6,05 <sup>b</sup>	40,47 ± 5,83 <sup>c</sup>	38,80 ± 5,84 <sup>d</sup>	0,000*
Physical activity level	1,50 ± 0,26 <sup>a</sup>	1,66 ± 0,32 <sup>b</sup>	1,84 ± 0,31 <sup>b</sup>	1,82 ± 0,20 <sup>b</sup>	0,000*
Fasting blood glucose (mg/dL)	118,10 ± 31,33 <sup>a</sup>	103,00 ± 21,40 <sup>a,b</sup>	96,40 ± 15,13 <sup>b</sup>	97,35 ± 10,95 <sup>b</sup>	0,001*
Ghrelin (pg/mL)	1123,66 ± 660,01 <sup>a</sup>	546,09 ± 253,31 <sup>b</sup>	382,28 ± 121,03 <sup>c</sup>	259,93 ± 96,27 <sup>d</sup>	0,000*
TSH (µIU/mL)	2,07 ± 0,74 <sup>a</sup>	1,41 ± 0,75 <sup>b</sup>	1,34 ± 0,69 <sup>b</sup>	1,36 ± 0,77 <sup>b</sup>	0,000*
Energy intake (kcal)	1415,84 ± 455,33 <sup>a</sup>	584,67 ± 209,12 <sup>b</sup>	636,79 ± 183,52 <sup>b</sup>	666,60 ± 178,98 <sup>b</sup>	0,000*

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#### MON-PO521

##### BODY COMPOSITION USING L3 LEVEL CT IMAGING AND SURGICAL OUTCOME IN INFLAMMATORY BOWEL DISEASE

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**Rationale:** Inflammatory bowel disease is known to present protein energy malnutrition from malabsorption and protein leakage caused by chronic inflammation of the intestinal tract, resulting in decreased body muscle mass and fat mass. We examined the frequency of sarcopenia and the relationship between the body composition and prognostic factors in hospitalized patients with inflammatory bowel disease (IBD).

**Methods:** We enrolled 187 patients with IBD who have admitted to our hospital since 2010. We retrospectively measured L3 level skeletal muscle area, psoas muscle area, subcutaneous and visceral fat area from CT at hospitalization. Clinical data at hospital admission and the follow-ups were extracted from the electronic medical record, and the relation was examined. OsiriX was used to analyze CT images.

**Results:** The subjects were 99 patients with Crohn's disease and 88 cases with ulcerative colitis. The ratio of male to female was 126: 61. The median age was 34 years (including 33 cases over 50 years old). Using the criteria of the Japan Society of Hepatology, the proportion of patients with low skeletal muscle index was 27.2% for Crohn's disease and 43.2% for ulcerative colitis. Cox proportional hazards regression analysis examined the relationship between each parameter and intestinal resection using multivariate analysis and found that male, Crohn's disease (>ulcerative colitis), decreased psoas muscle index, increased visceral fat/subcutaneous fat area ratio were significant factors associated with intestinal resection.

**Conclusions:** Decrease in muscle mass in hospitalized patients was more common in patients with ulcerative colitis compared to Crohn's disease. However, the decrease in muscle mass was significantly associated with intestinal resection in Crohn's disease, but not in ulcerative colitis. Furthermore, our results suggest that visceral fat, which is known as a source of tumor necrosis factor-alpha and other adipokines, may modify the pathophysiology of Crohn's disease.

**Disclosure of Interest:** None declared.

#### MON-PO522

##### SARCOPENIA IN PATIENTS WITH SUPRACRICOID LARYNGECTOMY

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**Rationale:** Sarcopenia can be defined as a combination of low skeletal muscle mass and decreased muscle function and can be used as a significant prognostic factor on overall survival in patients with head and neck cancer (1,2). The aim of the study is investigate of the frequency of the sarcopenia in patients with supracricoid laryngectomy

**Methods:** The data of 31 patients who underwent supracricoid laryngectomy between the years of 2009–2018 in Ege University Medical Faculty Otorhinolaryngology Department were

retrospectively reviewed., SARC-F questionnaire, isometric handrip strength measure (JAMAR), Bioelectrical Impedance Analysis and 4 mt walking test were applied to all patients. European Working Group on Sarcopenia in Older People (EWG SOP2) criterias were used for classification.

**Results:** 31 patients (4 female, 27 male with the mean age 66.5 ± 9.55) were included in the study. According to SARC-F questionnaire 1 patient (%3) had sarcopenia. When measured isometric handrip strength with Jamar hydraulic dynamometer propable sarcopenia determined in 19 patients (% 62) according to EWG SOP2 criterias. According to Bioelectrical Impedance Analyze, sarcopenia was detected in 4 patients (%12) sarcopenia according to EWG SOP2 criterias. According to 4 mt walking test severe sarcopenia was detected in 11 patients (% 35) according to EWG SOP2 criterias.

**Conclusions:** Sarcopenia is a risk factor for physical disability, decreased quality of life (1) EWG SOP2 criterias can be used for the diagnosis (2). Recent studies have shown that sarcopenia can be used as a prognostic factor for overall survive in head and neck cancer patients (1,2). In patients with supracricoid laryngectomy, low food intake poses a risk for sarcopenia because of impaired swallowing functions (1). Also presence of cancer, increased catabolic pathways associated with age and larengeal cancer, increased inflammation associated with cancer further increase this risk (1,2). Sarcopenia may be prognostically helpful among patients with supracricoid laryngectomy (1).

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**Disclosure of Interest:** None declared.

#### MON-PO523

##### RELATION BETWEEN ORAL HEALTH AND NUTRITIONAL STATUS

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**Rationale:** Oral health problems related with tooth loss or periodontal diseases are fundamental health problems which may have a high impact on nutrition, primarily in the elderly. Aim of this study was to determine the association between oral health and nutritional status in the community-dwelling Turkish elderly.

**Methods:** Nutritional status was assessed by the Mini Nutritional Assessment (MNA). In oral examination decayed, use of dental prostheses, number of natural teeth, use of toothpaste and tooth brushing frequency were noted. Oral health-related quality of life and periodontal status were assessed by the Oral Health Impact Profile (OHIP-14) questionnaire and the Community Periodontal Index (CPI), respectively.

**Results:** A total of 476 elderly subjects were included in this study. The mean age and standard deviation (SD) were 71.8 (5.6) years (52.3% were female). The well nourished frequency rate was 52.1%. The remaining 44.2% of elderly subjects were determined to be at risk of malnutrition (MNR) and 3.7% had malnutrition (MN). 37.4% of the subjects were edentulous. Using toothpaste and brushing teeth rate was about 50%. MN/MNR was higher in non-toothpaste users (59.4%) than non tooth brushers (53.1%). In univariate analyses, demographical characteristics (gender, educational levels, and income), cognitive

impairment, depression, oral health indicators (use of toothpaste, tooth-brushing and oral health-related quality of life) were tested. In multivariate analysis depressive mood (OR 2.54 95% CI 1.59–4.06), use of toothpaste (OR 0.58 95% CI 0.38–0.88) and higher OHIP scores (OR 1.03 95% CI 1.01–1.06) were detected as independent determinants of poor nutritional status in elderly.

**Conclusions:** Depressive mood, use of toothpaste and OHIP are detected as significant parameters to assess the relationship between oral health and nutritional status in the community-dwelling Turkish elderly.

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**Disclosure of Interest:** None declared.

#### MON-PO524

##### CHANGES IN NUTRITIONAL ENERGY AND SUBSTRATE INTAKE IN PREGNANT CZECH WOMEN IN THE LAST DECADE.

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**Rationale:** Malnutrition of the maternal organism during pregnancy may result in disease of the child in later life. The aim of the study was to evaluate the changes in the intake of nutritional energy and substrates (NESI) in Czech pregnant women over the last 10 years and determine the accuracy of the predictive equations for PNES.1

**Methods:** Thirty-five Czech pregnant women 29 ± 2,79 years old were attended in the pilot study. NESI in the individual trimesters of pregnancy obtained from weekly nutritional records was evaluated by the computer program NutriDan, and compared with values from the predictive equations for PNES.1

**Results:** Over 10 years, PNES (according to the predictive equations) increased in respect of protein in the 1st trimester of pregnancy by 9,58% ( $p = 0.02$ ), and decreased in respect of carbohydrate intake in all trimesters by 10,06% ( $p = 0.04$ ), 14,60%. ( $p = 0.0002$ ), and 12,71% ( $p = 0.00003$ ) respectively.

**Conclusions:** There were no differences in NESI on each day of week over the period despite expectation. The predictive equations for PNES can be used during pregnancy even after 10 years, except for protein intake in the 1st trimester and carbohydrate intake throughout pregnancy. A new equation for PNES will be derived from the results for clinical practice. *The study was supported by GA UK č. 1306218, SVV/2017/260417, MH CZ –DRO (UHHK, 00179906) a PROGRES Q42*

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**Disclosure of Interest:** None declared.

#### MON-PO525

##### IMPLEMENTATION OF STRATEGIES TO AMELIORATE TREATMENT OF MALNOURISHED PATIENTS IN A MAXIMUM-CARE HOSPITAL – EVALUATION OF QUANTITY AND QUALITY OF THE NUTRITIONAL RISK SCREENING

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**Rationale:** Treatment of disease-related malnutrition is a topic with pronounced medical and economic consequences. In 2012, the nutrition support team (NST) at the Augsburg Hospital introduced strategies for better detection and treatment of malnourished patients. We monitored the development of revenues and evaluated both quantity and quality of the established screening method.

**Methods:** The Nutritional Risk Screening 2002 (NRS) was integrated in the clinic information system and is now performed computer-based as well as the assessment, recommendations, and reports of the NST. A treatment algorithm was created: with a NRS score = 3 patients receive oral nutritional supplements by the respective ward, with a score >3 the NST is involved for further assessment and treatment. The number of detected patients as measured by the respective entries in the German DRG-system was evaluated as well as the possible impact on revenues. A newly created evaluation tool was used to assess the hospital-wide screening rate. The data of all wards, except for the intensive care units, were included. To check the quality of the screening, we retrospectively investigated the medical reports and patients charts.

**Results:** The table shows the number of patients that were detected as malnourished and represented in the DRG-system in the years 2012–2018.

	Coded Cases	With additional revenues	Additional Revenues (€)	Additional Revenues/ Coded Case (€)
2012	217	12%	59.025	272
2013	804	10%	108.023	134
2014	1893	6%	206.015	109
2015	2637	7%	376.600	143
2016	3325	5%	345.140	104
2017	3524	4%	320.777	91
2018	2886	4%	252.623	88

We observed a steady growth in the number of coded cases, except in 2018. The percentage of cases that triggered additional revenues declined every year, reflecting the annual corrections in the DRG-system.

At the appointed date we counted 1277 in-patients, 1012 of which (79%) underwent the NRS. 110 patients had a score of 3 points, 116 a score >3, corresponding to 22% of the in-patients. Of these only 23% received nutritional support according to the algorithm or the recommendations of the NST. We checked the quality of 449 screening sheets. 158 (35%) proved to be erroneous, 21 patients at risk were not detected. The most frequent mistakes were height (30%), body weight (11%), and severity of disease (15%). 268 screenings (60%) were incomplete because of unknown body weight loss.

**Conclusions:** Our data show that we were successful in establishing the awareness for malnutrition and the screening process. Our efforts were compensated by additional revenues. But our data also reveal that in clinical routine the screening and treatment of malnourished patients need to be improved. Repeated training and better



documentation of height and body weight is required. Interdisciplinary communication and interface management should be intensified.

**Disclosure of Interest:** None declared.

#### MON-PO526

##### DIALYSIS MALNUTRITION SCORE AS SIMPLE NUTRITION ASSESSMENT AND ITS CORRELATION WITH ANTHROPOMETRY AND BIOCHEMICAL PARAMETERS IN HEMODIALYSIS PATIENTS IN UNIVERSITAS GADJAH MADA HOSPITAL YOGYAKARTA-INDONESIA

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**Rationale:** Malnutrition is important problems in hemodialysis patients due to side effect of the therapy. Dialysis malnutrition score (DMS) is the newest reliable and valid method to evaluate malnutrition in these patients. We aim to assess malnutrition using DMS and investigate its correlation with objective nutrition assessment parameters.

**Methods:** This cross-sectional study was conducted on January 2019 and involved 71 hemodialysis patients in Universitas Gadjah Mada Hospital. Participants were assessed using Dialysis Malnutrition Score (DMS), anthropometry parameter (body mass index/BMI, mid upper arm circumference/MUAC, and body composition measurement) and biochemical assessment (albumin and total iron binding capacity/TIBC).

**Results:** Prevalence of malnutrition based on DMS was 33.8%, while only 5.6% of participants had hypoalbumin. It was found that skeletal muscle had significant negative correlation with DMS ( $r = -0.240$  and  $p = 0.037$ ). The BMI, MUAC and percent body fat were positive correlated significantly with DMS ( $r = 0.395$ ,  $0.267$  and  $0.272$ , respectively, while  $p = 0.002$ ,  $0.021$  and  $0.019$ , respectively). Albumin and TIBC had no significant positive correlation with DMS.

**Conclusions:** The lower skeletal muscle and the higher BMI, MUAC and percent body fat, the higher risk of malnutrition. Combined anthropometry-biochemical parameters with DMS is necessary for assessing malnutrition in hemodialysis patients.

**Disclosure of Interest:** None declared.

#### MON-PO527

##### VALIDITY COMPARISON: NUTRITION SCREENING TOOLS AGAINST PATIENT GENERATED-SUBJECTIVE GLOBAL ASSESSMENT FOR ONCOLOGY PATIENTS IN DR. SARDJITO GENERAL HOSPITAL

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**Rationale:** Nutrition screening tools are necessary to predict malnutrition and affect to nutrition intervention. We aim to investigate the validity of nutrition screening tools for oncology patients.

**Methods:** This cross-sectional study was conducted on August 2018 and involved 175 oncology patients in Dr. Sardjito General Hospital. Malnutrition risk of participants were screened using Nutrition Risk Screening (NRS) 2002, Nutric-Score, Simple Nutrition Screening Tool (SNST), the Royal Marsden Nutrition Screening Tool (RMNST) and Malnutrition Screening Tool (MST). We assessed malnutrition status using Patient Generated-Subjective Global Assessment (PG-SGA) as a gold standard.

**Results:** Prevalence of malnutrition risk were 48.0% (NRS 2002), 11.4% (Nutric-Score), 58.9% (SNST), 84.6 (RMNST), 49.1% (MST). As 68.6% of participants were at malnutrition based on PG-SGA. Sensitivity were

obtained 63.33% (NRS 2002), 16.67% (Nutric-Score), 81.67% (SNST), 97.50% (RMNST), 64.17% (MST). Specificity were found 85.45% (NRS 2002), 100.0% (Nutric-Score), 90.90% (SNST), 43.64% (RMNST), 83.64% (MST). Positive predictive value were revealed 90.47% (NRS 2002), 100.0% (Nutric-Score), 95.14% (SNST), 79.05% (RMNST), 89.53% (MST). Negative predictive value were found 51.65% (NRS 2002), 35.48% (Nutric-Score), 69.44% (SNST), 88.89% (RMNST), 51.69 (MST). Area under curve (AUC) were obtained 0.744 (NRS 2002), 0.583 (Nutric-Score), 0.863 (SNST), 0.706 (RMNST), 0.739 (MST).

**Conclusions:** The SNST and RMNST had excellent sensitivity for identifying patients who were at risk of malnutrition, while for identifying patients who were not at risk of malnutrition only RMNST which had poor specificity. Based on the AUC, SNST had the best accuracy for screening in oncology inpatients setting.

**Disclosure of Interest:** None declared.

#### MON-PO528

##### DISORDERS OF NUTRITIONAL STATUS IN PATIENTS QUALIFIED FOR SURGERY DUE TO HIP OSTEOARTHRITIS

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**Rationale:** The recent studies suggests that high dietary protein levels may be beneficial in reducing bone loss and hip fracture risk in patients with hip osteoarthritis. In turn, in patients undergoing surgery, the abnormal nutritional status may affect the complications after the procedure.

The aim of the study was a comprehensive assessment of the nutritional status of patients qualified for surgery due to osteoarthritis of the hip.

**Methods:** 52 people (24 K, 28 M) aged  $67.5 \pm 9.2$  years underwent hip arthroplasty in the Orthopedic Clinic of GUMed. Nutritional status was assessed according to MNA. Body composition (BIA) and hand grip strength were examined. In addition, a 24-hour nutritional interview was collected and analysed.

**Results:** The low protein intake was found in 44.4% of subjects, low calcium intake in 84.4%; the Ca/P ratio in diet was 0.53 (recommended 1–1.5). The mean supply of vitamin D with diet was  $2.5 \pm 2.2 \mu\text{g}$  ( $\text{AI} = 15 \mu\text{g}$ ). There were no significant differences between the group of patients with postoperative complications and without complications. The length of hospitalisation significantly correlated with the ECM/BCM malnutrition index ( $r = 0.35$ ,  $p < 0.05$ ).

**Conclusions:** In the study group, there were evident nutritional disorders in the form of excessive body mass with the simultaneous risk of malnutrition and low intake of protein, calcium, and vitamin D in the diet.

**Disclosure of Interest:** None declared.

#### MON-PO529

##### PERFORMANCE OF NUTRITIONAL ASSISTANCE CARE LEVELS IN PREDICTING PROLONGED HOSPITAL STAY, INFECTION AND HOSPITAL MORTALITY

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**Rationale:** Different methods have been proposed for nutritional screening and assessment of inpatients, and integrated approaches are encouraged for patient care. This retrospective cohort study aimed to evaluate the performance of nutritional assistance care (NAC) levels determined in a tertiary public hospital to predict prolonged hospital stay, infection and mortality of inpatients.

**Methods:** A one-year period of secondary data from patients (adults and elderly) admitted to clinical and surgery units in Hospital de Clinicas de Porto Alegre (Brazil) was obtained. Only the first evaluation of each patient was considered, and patient data (demographic, clinical, anthropometric and nutritional risk factors) were obtained from the electronic medical records via query requests. After nutritional assessment, NAC was determined according to each patient's age, BMI, and the number of nutritional risks in four levels.

**Results:** In the present study, 5,114 patients were included and were  $60 \pm 17$  years old and 50.6% male. 59.5% of patients were admitted in the surgical unit, 26% of patients experienced prolonged hospital stays, 16.1% of patients had hospital infections, and 2.7% of patients died. Patients was classified into NAC levels: NAC1 = 1.9%, NAC2 = 59.0%, NAC3 = 16.0% and NAC4 = 23.2%. The survival curve shows that the probability of mortality increases with NAC (Cox analysis;  $p < 0.001$ ). Furthermore, a positive association with death was observed in patients with NAC3 (PR = 6.95; 95% CI 3.56–13.56) or NAC4 (PR = 12.67; 95% CI 6.79–23.67). The AUC ROC (mortality as outcome) was 0.79 (95% CI 0.76–0.83) for NAC3 or above. Positive associations between infection or prolonged hospital stay with NAC3 or NAC4 were also observed.

**Conclusions:** In this study, inpatients classified as at least NAC3 had a higher risk of mortality, infection and prolonged hospital stay.

**Disclosure of Interest:** None declared.

#### MON-PO530

##### IN FASTING, BMI, ACTIVITY OF DAILY LIVING AND IMMUNITY ARE NOT DETERIORATED EVEN WHEN RAPID TURNOVER PROTEINS DECREASE, HOWEVER, THEREAFTER, DETERIORATED WITH A REDUCTION OF SERUM ALBUMIN

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**Rationale:** In elderly people, body mass index (BMI), activity of daily living (ADL) and immunity are important factors to live their healthy life. In order to keep these factors better, nutrition may play an important role. Serum proteins are considered an essential nutritional factors, then the association of serum proteins and BMI, ADL and immunity was investigated.

**Methods:** Eighty-five elderly people (18 males, 67 females,  $84 \pm 9$  years) admitted to a geriatric health services facility for more than three months and in a stable state were subjected. Their ADL was evaluated by Barthel Index (BI), and immunity was assessed by CD4<sup>+</sup> T cell counts (CD4). The association of BMI, BI and CD4 with serum proteins was investigated. Albumin, transferrin (TRF), transthyretin (TTR) and retinol binding proteins (RBP) are analyzed as serum proteins. Albumin is a static index of nutrition, meanwhile TRF, TTR and RBP, called rapid turnover proteins, are dynamic indexes of nutrition. The biological half-life times of these serum proteins are different each other.

**Results:** The correlation coefficient of BMI with albumin was  $r = 0.2259$  ( $p = 0.038$ ), but that with TRF was  $r = -0.01021$ , with TTR,  $r = 0.0375$  and with RBP,  $r = -0.0774$  respectively. Rapid turnover proteins are not statistically correlated with BMI. The correlation coefficient of BI with

albumin was  $r = 0.4100$  ( $p = 9.73 \times 10^{-5}$ ), but that with TRF was  $r = 0.0909$ , with TTR  $r = -0.0196$ , and with RBP,  $r = -0.0966$ . Rapid turnover proteins are not statistically correlated with BI either. The correlation coefficient of CD4 with albumin was  $r = 0.26$  ( $p = 0.0134$ ) but that with TRF was  $r = 0.090$ , with TTR,  $r = -0.0196$  and with RBP,  $r = 0.0196$ . Rapid turnover proteins are not correlated with CD4 either. BMI, BI and CD4 were associated with albumin, but with rapid turnover proteins.

**Conclusions:** In this study, BMI, ADL and immunity were associated with serum albumin. However, they are not associated with TRF, TTR, RBP. The half-life of albumin is 21 days, that of TRF, 7 days, that of TTR, 3 days and that of RBP, 0.5 day, respectively. In the process of fasting, RBP, TTR, TRF and albumin decrease in that order according to their biological half-life time. BMI, ADL and immunity might not be deteriorated soon after fasting, even when RBP, TTR and TRF somehow decrease, but thereafter, finally when albumin is reduced, BMI, ADL and immunity might be deteriorated. In ancient times when our ancestors could not eat adequately yet, they tried to move around to get foods while their BMI, ADL and immunity were still maintained, and eventually they could survive.

**Disclosure of Interest:** None declared.

#### MON-PO531

##### EVALUATION OF THE APPLICABILITY AND FEASIBILITY OF GLIM CRITERIA TO DIAGNOSE MALNUTRITION IN CLINICAL PRACTICE

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**Rationale:** The Global Leadership Initiative on Malnutrition (GLIM) comprising representatives of four clinical nutrition societies reached a new global consensus for diagnosing malnutrition. We evaluated the applicability and feasibility of these new GLIM criteria in clinical practice. Furthermore, we assessed whether malnutrition was associated with length of hospital stay according to the GLIM diagnostic criteria.

**Methods:** This study concerned a post hoc analysis of a prospective cohort study including hospital patients ( $n = 624$ ) from our departments of Gastroenterology, Gynecology, Urology, and Orthopedics. First, patients were screened using the MUST score. Patients scoring  $MUST \geq 1$  were included in the diagnostic assessment according to the GLIM criteria.

**Results:** Overall 624 patients, with a mean age of  $60 \pm 16$  years (47% male) were included. In total, 153 patients (25%) were screened as at risk by the MUST score and the majority of patients scored positive on unintentional weight loss (82%). Based on GLIM criteria, 132 patients (21%) were classified as malnourished compared to 172 (28%) according to the PG-SGA. In >90% of the cases the items unintentional weight loss (phenotypic criteria) and disease burden (etiologic criteria) lead to the diagnosis of malnutrition. Reduced muscle mass in absence of unintentional weight loss and low BMI were not observed. Also, malnutrition was not associated with length of stay.

**Conclusions:** Our findings raise questions about the relevance of including reduced muscle mass as a criterion since reduced muscle mass was overdue to diagnose malnutrition in our population. Also, assessment of muscle mass is not always feasible in the clinical and/or research setting. Future studies should bolster the GLIM criteria in other populations and clinical settings.

**Disclosure of Interest:** None declared.

### MON-PO532 THE OPTIMAL ESTIMATE FOR RESTING METABOLIC RATE IN MALE BODYBUILDERS

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**Rationale:** Increased fat free mass is expected to increase the resting metabolic rate (RMR) of bodybuilders. However, it is currently unknown how to accurately predict the RMR of bodybuilders. Therefore, the aim of this study is to determine whether an increase in fat free mass correlates with an increased RMR in bodybuilders and to determine the best accurate formula to predict the RMR in male bodybuilders.

**Methods:** After an overnight fast height (m), weight (kg) and fat free mass index (FFMI) in kg/m<sup>2</sup> were measured in male bodybuilders. RMR was measured by indirect calorimetry (RMR<sup>m</sup>) and compared to 11 predictive equations for RMR (RMR<sup>p</sup>). Predictive equations were included when based on fat free mass. Accuracy of RMR<sup>p</sup> was evaluated as percentage of subjects predicted within ±10% of RMR<sup>m</sup>. Root mean squared error (RMSE) and mean absolute difference (bias) between RMR<sup>p</sup> and RMR<sup>m</sup> were calculated. Relationship between FFMI and RMR<sup>m</sup> was determined using Pearson's correlation.

**Results:** Twenty male bodybuilders (age: 25.5 yr, weight: 91.7 kg, BMI 25.1 kg/m<sup>2</sup>, FFMI 24.2 kg/m<sup>2</sup>) were selected and signed informed consent. FFMI was positively correlated with RMR<sup>m</sup> (Pearson  $r = 0.71$ ,  $p < 0.01$ ). Most accurate equations were the Cunningham, Johnstone and Katch-McCardle with 70%, 65% and 60% accurate predictions, respectively. Bias of these equations was -2.4, -8.5 and -9.5% and RMSE was 284, 354 and 371 kcal/day, respectively.

**Conclusions:** This study shows that an increased FFMI positively correlates with the RMR of bodybuilders. The Cunningham formula is the preferred equation for estimating the RMR of male bodybuilders.

**Disclosure of Interest:** None declared.

### MON-PO533 CORRELATION BETWEEN HANDGRIP STRENGTH AND MUSCLE MASS IN INTEGRATED INPATIENT ROOM OF CIPTO MANGUNKUSUMO HOSPITAL, INDONESIA

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**Rationale:** Muscle mass is one of body composition elements<sup>1</sup> while handgrip is commonly used as a functional capacity indicator.<sup>2</sup> The aim of this study was to analyze correlation between handgrip strength and muscle mass in integrated inpatient room of Cipto Mangunkusumo Hospital, Indonesia.

**Methods:** This study was a cross sectional study with consecutive sampling, as a part of malnutrition research in integrated inpatient room of Cipto Mangunkusumo Hospital, Indonesia. This study was conducted from October to December 2018. Inclusion criteria were patients admitted to integrated inpatient room and aged ≥18 year. Patient who was unable to do the measurement was excluded from the study. Handgrip strength was measured by using Jamar handgrip dynamometer and skeletal mass was measured by SECA medical Body Composition Analyzer (mBCA) 525.

**Results:** There were 185 subjects, consist of 90 men and 95 women in this study. The subjects had mean age 46.6±13.2 years, mean handgrip strength 16.5 ± 9.3 kg and mean skeletal mass 17.1 ± 7 kg.

Kolmogorov-Smirnov test resulted normal distribution data with  $p$  value > 0,05. Pearson Correlation show  $r = 0.281$ ;  $p < 0.001$  between handgrip strength and muscle mass.

**Conclusions:** The correlation between handgrip strength and muscle mass in integrated inpatient room of Cipto Mangunkusumo Hospital, Indonesia was significantly positive. The conclusion of this study was the lower handgrip, the less muscle mass. Results of this study can be used as a basis for further research about body composition and functional capacity in hospital.

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**Disclosure of Interest:** None declared.

### MON-PO534 CLINICAL IMPACT OF PREOPERATIVE SERUM CHOLINESTERASE IN GASTRIC CANCER

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**Rationale:** The preoperative nutritional and immunological statuses have been reported to be associated not only with postoperative complications, but also with prognoses of patients with gastroenterological malignancies. We have been reported the impact of the preoperative Onodera's prognostic nutritional index (PNI) and controlling nutritional status on both short-term and long-term outcomes in gastric cancer patients. The aim of this study was to investigate the value of the preoperative serum cholinesterase (ChE) levels on the short-term and long-term outcomes in gastric cancer.

**Methods:** We reviewed the medical records of 330 patients with gastric cancer who underwent gastrectomy at our hospital from 2004 to 2010. Serum cholinesterase level was used as preoperative nutritional index. Patients were divided into normal ChE group and decreased ChE group. Postoperative complications were classified by Clavien-Dindo classification. Overall survival curves were calculated by Kaplan-Meier methods. The outcomes from different groups of patients were compared by log-rank test.

**Results:** The mean preoperative ChE level was 262.8. Preoperative ChE had a significant correlation with preoperative PNI. Preoperative ChE was not associated with postoperative complications. Patients with decreased preoperative serum ChE had significant poor prognoses than patients with normal ChE levels in gastric cancer. The decreases of preoperative serum ChE levels were related to deaths by cancer in stage II-IV gastric cancer and deaths by other disease in stage I gastric cancer.

**Conclusions:** This study suggested that preoperative cholinesterase is a simple nutritional index and one of the predictors of the survival in gastric cancer.

**Disclosure of Interest:** None declared.

### MON-PO535 NUTRITIONAL STATUS ASSESSMENT OF ELDERLY PATIENTS IN NURSING HOME USING BIOIMPEDANCE SPECTROSCOPY

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**Rationale:** Phase angle (PA), which is one of the bioimpedance spectroscopy (BIS) indices, has been studied to have a significant role in evaluating nutritional status and predicting clinical outcomes in critically-ill patients. We investigated the association between PA and nutritional status assessment in elderly patients living in nursing homes.

**Methods:** Residents who are living in nine nursing homes in relation to Myongji hospital included in this study. PA was measured twice every 6 months using BIS and demographic and anthropometric data were collected. We divided the patients into two groups according to the median PA values (High PA  $>3.65$ ; Low PA  $\leq 3.65$ ). In addition to the comparison between the two groups, and multivariate regression analysis were performed to verify the association between PA and nutritional markers.

**Results:** A total of 213 nursing home residents were enrolled in this study. Mean age was 82.1 years old, female was 163 (76.5%). High PA group showed higher body mass index (high PA,  $22.4 \pm 3.6$  kg/m<sup>2</sup>; low PA,  $19.2 \pm 3.4$  kg/m<sup>2</sup>,  $P < 0.001$ ) and mini nutritional assessment (MNA) score (high PA,  $10.2 \pm 1.8$ ; low PA,  $8.1 \pm 2.0$ ,  $P < 0.001$ ). In addition, anthropometric data such as mid-arm circumference, hand grip strength, and skin fold thickness were significantly higher in high PA group. When analyzing parameters of the BIS according to PA group, high PA group showed lower over-hydration and higher lean tissue index. However, fat tissue index was not different between the two PA groups. The same results were reproduced in the second BIS results. In multivariate regression analysis, PA was significant factor for associating with MNA score after adjusting sex, age, and body mass index. ( $\beta = 0.135$ ,  $P < 0.001$ ).

**Conclusions:** This study suggests that PA reflects nutritional status in the elderly who are living in nursing homes using noninvasive BIS technique.

**Disclosure of Interest:** None declared.

#### MON-PO536

##### EVALUATION OF DIARRHEA USING A STOOL CHART AND THE VALIDITY OF THE CHART

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**Rationale:** Conducting appropriate evaluations and monitoring of diarrhea is important in tube feeding management. In this study, we reviewed and examined the stool chart to evaluate its validity for tube feeding administration.

**Methods:** We modified the King's stool chart (KSC) by Whelan et al. to better suit the patients of the hospital the authors belong to, and evaluated this Modified King's stool chart (MKSC). In the intervention with a nutrition support team (NST) we performed nutrition management using tube feeding to 47 patients, and conducted a retrospective study with the MKSC values for a total of 312 days. Using all of the MKSC values, we divided the patients into 2 groups: with or without diarrhea risk factors (use of antibiotics, presence of hypoalbuminemia ( $25$  g/L  $<$ ) and Clostridium difficile (CD)), and compared the groups by t-test. Based on the mean MKSC value we divided the patients into four groups: A (MKSC values: 0–4), B (5 to 9), C (10–14), and D ( $\geq 15$ ). Next, the odds ratios for discontinuation of tube feeding due to absence of probability of improvement in stool forms were calculated for each group. To determine cut-off values for MKSC we performed a Receiver Operating Characteristic analysis using signs of improvement in stool forms (possible or not possible to continue tube feeding) as the objective variable and the highest MKSC value as the explanatory variable.

**Results:** There was a significant difference in the mean MKSC values of diarrhea. Comparing the groups with and without risk factors for diarrhea (CD:  $p = 0.005$ , with or without antibiotics:  $p = 0.039$ , and hypoalbuminemia ( $25$  g/L  $<$ :  $p = 0.0002$ ), the odds ratio of the group C was double that of B, and the D was 9.3 times higher than B. As a result of the Receiver Operating Characteristic analysis, we obtained the following values: 0.75 for the area under the curve (AUC), 15 points for the cutoff value, 1.0 for the sensitivity, 0.575 for the specificity,  $p = 0.038$ , and  $R^2 = 0.11$ . It was suggested that patients who reached 15 points even if only once, the stool form did not improve with a probability of 73%, allowing the discontinuation of tube feeding. Considering these results, we evaluated the details of the chart.

**Conclusions:** The findings suggest that the newly created chart is useful to evaluate the validity of tube feeding during the administration as well as to evaluate diarrhea.

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#### MON-PO537

##### REFERENCE OF MALNUTRITION PREVALENCE DIAGNOSED ACCORDING TO GLOBAL LEADERSHIP INITIATIVE ON MALNUTRITION CRITERIA IN THE ELDERLY REQUIRING CARE IN JAPAN

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**Rationale:** Most of elderly who requires nursing care has chronic disease, it diminished intake, there has been a great increase in the fall risk through decrease of skeletal muscle by less momentum, and increasing risk of malnutrition. And malnutrition known for adversely affect elderly's prognosis about infect by decreased immunity and delayed healing of disease. In 2018, the Global Leadership Initiative on Malnutrition (GLIM) released new criteria for diagnosing and grading malnutrition. However, there are few studies on the reliability and relevance of the GLIM standards in elderly people in Asia. Therefore, the present study aimed to investigate the prevalence of GLIM-defined malnutrition in elderly Japanese facilities to identify severe malnutrition according to GLIM criteria.

**Methods:** The subjects were 1,327 people aged 67–107 (average  $88.3 \pm 5.9$  years) who live in nursing homes, and screened under the GLIM criteria using the Malnutrition Universal Screening Tool (MUST)

to identify undernutrition risk persons, and then Under-diagnostic assessment of those who are at risk of undernutrition should be judged whether they fall under the phenotype and etiology, and those who fall under either the phenotype or etiology may be those who are under the threat of undernutrition and who fall under both the phenotype and etiology I was diagnosed with malnutrition. Finally, the severity of those who were diagnosed with malnutrition was determined.

**Results:** As a result of testing using GLIM criteria, 608 out of 1,327 people at risk for malnutrition (46%). Of the 608 patients, 205 (15.4% of the total) corresponded to the phenotype only, 6 (0.5% of the total) corresponded to the etiologic type only, and 392 were typified by the phenotypic and etiologic type (29.5% of the total). As a result of judging severity of 392 persons who corresponded to the phenotype and etiologic type, the moderate was 159 (12.0% of the whole) and the severe was 233 (17.6% of the whole).

**Conclusions:** Based on the above results, the prevalence of malnutrition diagnosed on the basis of GLIM in elderly people requiring longevity in Japan was approximately 30%.

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**Disclosure of Interest:** None declared.

#### MON-PO538

##### CROSS CULTURAL ADAPTATION AND VALIDATION OF THE 'PATIENT-GENERATED SUBJECTIVE GLOBAL ASSESSMENT (PG-SGA)' FOR NUTRITIONAL STATUS ASSESSMENT OF CANCER PATIENTS IN IRAN

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**Rationale:** Patients with cancer are at high risk of malnutrition. This may result in a remarkable reduction in the quality of life and poor prognosis. The Patient-Generated Subjective Global Assessment (PG-SGA) is a standard tool for assessment of the nutritional status of cancer patients in both research and clinical settings which enables screening, assessing, and following up nutritional status, of the cancer patients. The aim of this study was cross culturally adaption and validation of PG-SGA in Persian for using in Iranian patients.

**Methods:** The guidelines of International Society for Pharmacoeconomics and Outcomes Research (ISPOR) was used for the cross cultural adaption of PG-SGA. The measures for content, face and construct validity using exploratory factor analysis were investigated. Tool relevancy for data analysis was calculated by intra class correlation coefficient and internal consistency using Cronbach's Alpha coefficient.

**Results:** The accessibility rate of PG-SGA was 100%, and content validity in terms of its ease of understanding, difficulty, and relevancy were found 0.94, 0.84 and 0.92, respectively. The face validity was 100%. The reliability of the tool using test-retest was calculated 0.84. An internal consistency of 0.60 was obtained using Cronbach's Alpha,

and a value of more than 0.60 for structural validity was achieved ( $p < 0.001$ ).

**Conclusions:** The Persian version of PG-SGA can be easily understood. It can be used for assessing and surveilling the nutritional status of the patients with cancer in Iran.

**Disclosure of Interest:** None declared.

## Nutritional epidemiology II

#### MON-PO539

##### EXPLORING THE ASSOCIATION BETWEEN ARTERIAL DYSFUNCTION AND SKELETAL MUSCLE MASS AND FUNCTION IN HEALTHY ADULTS: A SYSTEMATIC REVIEW

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**Rationale:** The prevalence of arterial dysfunction increases with age, especially in older adults, a population also prone to sarcopenia. This systematic review explores the association between arterial dysfunction and skeletal muscle mass and function in healthy adults.

**Methods:** EMBASE and MEDLINE were searched for original articles between January 2009 and March 2019. Evidence from cross-sectional and randomized controlled studies was included. All relevant articles were assessed for predefined criteria regarding study outcome, population, and design. Out of 1246 studies, 19 studies were included. The primary assessments of skeletal muscle health were muscle mass and strength. Arterial health was assessed by arterial stiffness (pulse wave velocity, augmentation index) and carotid intima-media thickness.

**Results:** All 19 studies demonstrated a significant association between arterial dysfunction and skeletal muscle health. Of the 8 studies that examined muscular strength and macrovascular blood flow, all reported a significant negative association between strength and arterial stiffness. All 7 studies measuring muscle mass reported a significant negative correlation between muscle mass and arterial stiffness. The remaining 4 studies examined muscular function and demonstrated a significant negative association between muscular function and arterial stiffness.

**Conclusions:** Multiple studies have revealed an association between arterial health and skeletal muscle impairment in healthy adults, which warrants further investigation. The review highlights heterogeneity in methods to assess arterial health. This study also points to the importance of screening for muscle impairment in patients with arterial dysfunction and initiating early nutrition and exercise intervention to prevent progression to sarcopenia in this population.

**Disclosure of Interest:** J. Lieblein-Boff Shareholder of: Abbott, S. Dvoretzkiy: None declared, S. Pereira Shareholder of: Abbott, S. Jonnalagadda Shareholder of: Abbott.

#### MON-PO540

##### EXPLORING THE IMPACT OF DEMOGRAPHICS ON DECREASED BONE AND JOINT HEALTH IN AGING POPULATIONS: A SYSTEMATIC REVIEW

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**Rationale:** The global population over age 60 is expected to double by 2050 making age-related decreases in bone and joint health a growing

concern. A systematic review was conducted to address the impact of age, gender, and ethnicities on bone and joint-related health concerns.

**Methods:** PubMed and ProQuest were used to identify peer-reviewed, original articles from 2009 to 2019 on search terms related to bone and joint health as well as mental and physical function parameters. Of 311 studies screened, 190 studies were included based on age, population, study design, and health conditions.

**Results:** Of the 190 studies across global populations, 141 showed that Quality of life (QoL) or health-related QoL and mobility were decreased with age-related decline in bones and joints. Thirty-three studies stratified data by gender and reported that QoL and mobility were worse in aging females with bone and joint conditions compared to their male counterparts. The associations between gender differences and mental and social health measures were not definitive; however 15 studies showed that mental and social health decline with bone and joint health issues. Two studies analyzed bone mineral density (BMD) changes across ethnic groups in aging women. While BMD declined across all groups, this decline in BMD was most prominent in Asian women.

**Conclusions:** Age-related declines in bone and joint health were associated with mental and functional concerns, including declined QoL or health-related QoL, low mobility, and poor physical function. Age-related changes in function may affect women to a greater degree than men; however, gender did not clearly contribute to worse scores in mental and social health. There may be differences across ethnicities, but this has not been widely characterized.

**Disclosure of Interest:** J. Lieblein-Boff Shareholder of: Abbott, K. Chiu: None declared.

#### MON-PO541

##### THE IMPORTANCE OF PARENTERAL NUTRITION COMPOSITION IN THE CONSERVATIVE TREATMENT OF ABDOMINAL CATASTROPHE

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**Rationale:** Parenteral nutrition (PN) plays a crucial role in the treatment of patients with abdominal catastrophe (AC) with intestinal fistulae. Optimizing the composition of PN can lead to an improvement in the success of the conservative healing of these patients. Our aim was to evaluate the effect of PN on the success of conservative treatment of AC.

**Methods:** A total of 114 patients treated in our center in 2015–2018 were enrolled in the study. The composition of PN in the main macronutrients was analyzed retrospectively and compared with the success of 6-week conservative treatment of AC. Comparison of results was performed by unpaired T test.

**Results:** All patients were provided with appropriate nutritional support based on recent recommendations. Of 114 patients, spontaneous closure was achieved in a total of 18 patients (15.8%). In the group of conservatively healed patients the composition of PN: energy was 1832 ± 337 kcal/day (26.2 ± 4.8/kg of body weight), amino acids 110 ± 32 g/day (1.6 ± 0.5/kg of body weight), glucose 278 ± 88 g/day (4 ± 1.3/kg of body weight), fat 31 ± 22 g/day (0.42 ± 0.3/kg of body weight). In the group of conservatively unhealed patients, the composition of PN: energy was 1645 ± 459 kcal/day (23.5 ± 6.6/kg of body weight), amino acids 102 ± 30 g/day (1.5 ± 0.4/kg of body weight), glucose 254 ± 92 g/day (3.6 ± 1.3/kg of body weight), fat 20 ± 22 g/day (0.3 ± 0.3/kg of body weight).

Overall morality was 4.4%. The composition of PN was not statistically different between the two groups.

**Conclusions:** There was no difference in the composition of PN between the group of conservatively healed and unhealed patients

with AC. Thus, the success of conservative treatment was probably due to factors other than the difference in PN composition and will be the focus of our other analyzes.

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**Disclosure of Interest:** None declared.

#### MON-PO542

##### MALNUTRITION PREVALENCE AND BURDEN AMONG COMMUNITY-DWELLING OLDER SPANISH ADULTS

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**Rationale:** Up to 30% of community-dwelling older adults across the globe are at-risk of malnutrition but little is known about the burden of malnutrition among this population. We assessed malnutrition risk prevalence and its impact on health outcomes and healthcare utilization in a population-based cohort of Spanish older adults.

**Methods:** Data from 1,660 older (range = 66–98 years) community-dwelling adults participating in the Toledo Study on Healthy Ageing waves 2 (year 2011–2013) and 3 (year 2015) were analyzed. Nutritional risk criteria included either body mass index (BMI) = 20–25 kg/m<sup>2</sup> or unintentional weight loss (≥4.5 kg in the last year), and/or low hand grip strength (<30.4 kg for men or 19.8 kg for women). Malnutrition status criteria included BMI < 20 kg/m<sup>2</sup> and presence of any of the other criteria. Six participants were classified as malnourished; therefore, a single group was created including both at-risk and malnourished participants.

**Results:** Malnutrition risk prevalence was 32.6%. Older (OR = 1.029–1.069), functionally-dependent (OR = 1.747–2.572), and depressed (OR = 1.087–1.101) participants and those being admitted to hospital (OR = 1.297–1.470) were more likely to be at-risk/malnourished. Furthermore, females (OR = 0.311–0.685) and participants with greater shoulder strength (OR = 0.916–0.958), lean mass (OR = 0.926–0.989), and whole-body fat (OR = 0.884–0.914) were less likely to be at-risk/malnourished. At-risk/malnourished participants had longer hospital stays (5.53 vs. 2.98 days, p < 0.01) and higher hospitalization costs (€2,189 vs. €1,692, p < 0.01) compared to well-nourished counterparts.

**Conclusions:** Malnutrition risk affects over 30% of Spanish community-dwelling older adults and has negative consequences on their health and economic outcomes. These results highlight the importance of introducing effective community-based nutrition screening and interventions to reduce malnutrition risk in community-dwelling older adults.

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#### MON-PO543

##### DISEASE AND FOOD INTAKE WITHIN LAST WEEK ARE CONTRIBUTING FACTORS TO MALNUTRITION, THE RESULTS OF NUTRITIONDAY 2018 IN CHINA

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**Rationale:** We aimed to analyze the data of worldwide nutritionDay 2018 from 10 large comprehensive hospitals in China and to elaborate the comprehensive situation of nutritional characteristics, nutritional support treatment programs and malnutrition risk factors of inpatients in China.

**Methods:** NutritionDay's standardized questionnaires were adopted, and we recruited inpatients in 10 hospitals on November 15, 2018. We collected information on patients' disease information, history of food intake, weight change, and nutritional support, etc. Malnutrition was objectively defined as a BMI <18.5 kg/m<sup>2</sup> or unintentional weight loss >5% in the last 3 months.

**Results:** A total of 930 patients from 10 hospitals participated in the survey (M 538 VS F 389, 57.8% VS 41.8%; Mean SD age 507.1 14.9 years). Among the 267 cases of malnutrition and malnutrition risk, 53.18% did nutritional support, and 127 cases did not do nutritional support, accounting for 46.82%. 142 (53.18%) patients of malnutrition and malnutrition risk received nutritional support: PN 54(20.3%), EN 88 (33%). Among the patients without malnutrition, 167 received nutritional support, accounting for 25.23%. Through multivariate analysis, it was found that the occurrence of malnutrition in hospitalized patients was not related to age, gender, but was related to the change of food intake within last week and the type of disease. **Conclusions:** Chinese hospital staff is generally lack of knowledge and awareness of malnutrition. Disease and food intake within last week are the contributing factors to malnutrition.

**Disclosure of Interest:** None declared.

#### MON-PO544

##### ARE WE EATING ENOUGH FRUITS AND VEGETABLES IN LATIN AMERICA?: RESULTS FROM ELANS STUDY

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**Rationale:** It has been recognized that fruit and vegetable intake (FVI) are important to prevent chronic diseases (1–2). The world health organization (WHO) recommended a minimum of five servings or 400 g per day (3).

The aim of this study is to determine the intake of fruits and vegetables by sex, age and socioeconomic level in eight Latin-American (LA) countries that participated of the ELANS study.

**Methods:** Data from the ELANS study, conducted in eight LA countries (Argentina, Brazil, Colombia, Costa Rica, Chile, Ecuador, Perú and Venezuela) was analyzed using descriptive statistics by age group, sex and socioeconomic level (SEL). The ELANS study interviewed 9218 subjects (4409 males and 4809 females) of the main cities in each country. The FVI was collected using two 24 hours dietary recall of nonconsecutive days by trained personal, following the multiple pass methodology. During the recall the personal used portion models and photos to determine the size portion in hose whole measures, later, those portions were translate into grams by dietitians trained to do so. **Results:** The mean FVI in the eight countries was 200 g/day (males 202 and females 198), being the highest in Ecuador (282 g/day) and the lowest in Colombia (161 g/day). The FVI is highest in males than females in 5 of the 8 countries (Colombia, Costa Rica, Chile, Ecuador and Venezuela).

The FVI increases with age, ranging from 176 g/day (CI 90.4–61.6) at 15–19 years of age to 226 g/day (CI 133–319) at 50–65 years of age. despite this increase, 70.99% of the later group did not reached the recommendations on any of the two days compared with 80.95% of the 15–19 y group (p < 0.001).

As expected, the intake was lower in the low SEL 180 g/day (CI 98.8–261.2) and higher in the high SEL 224 g/day (CI 128–320).

Finally, it is important to highlight that only 4.2% of the population met the recommendations in both days and 19.13% did it at least one day. The data presented in this analysis only take into account the subjects that after analysis were considered as plausible (people who did not sub or overestimate his/her intake)

**Conclusions:** The findings reinforce the low intake of fruits and vegetables by the Latin American population, since 95.8% did not reach the WHO's recommendations in both days. In addition, this low intake is independent of sex, age or SEL.

It is important to reevaluate the programs and policies to encourage FVI to mitigate future health issues associated with inadequate FVI.

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**Disclosure of Interest:** None declared.

#### MON-PO545

##### L-CARNITINE ORAL SUPPLEMENTATION IN CHILDREN WITH INTESTINAL FAILURE RECEIVING LONG TERM PARENTERAL NUTRITION

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**Rationale:** Carnitine is essential for long-chain fatty acids transport, and carnitine deficiency may contribute for intestinal failure associated liver disease. The aim of our study was to investigate the influence of oral carnitine supplementation 30 mg/kg in children receiving long-term parenteral nutrition on liver function.

**Methods:** We included 44 randomly selected patients (0.12–16.9 years old; median 5.9 years). Serum ALT, AST, GGTP, bilirubin, albumin, ALP, FFA, acylcarnitine profile and INR at the start point and after at least 6 months of L-carnitine oral supplementation in a day dose of 30 mg/kg were analysed using Wilcoxon matched-pairs test.

**Results:** Forty patients (90%) had serum carnitine concentration below normal level at a start point. Median free and total carnitine serum concentration increased after supplementation: 19.2 vs. 26;  $p < 0,001$  and 31.45 vs. 40.75;  $p < 0,001$  respectively. Median acylcarnitines concentrations significantly increased. Decrease of median INR 1.23 vs. 1.17;  $p < 0,005$  and median GGTP 29 vs. 20  $p < 0,007$  and median ALP 324 vs. 262.5,  $p < 0,002$  were observed. No significant changes were observed with respect to alanine aminotransferase, aspartate transaminase, bilirubin, albumin and free fatty acids.

**Conclusions:** The majority of our patients had carnitine deficiency. Oral supplementation of L-carnitine increased serum free and total carnitine concentration, increased long-chain acylcarnitines concentrations, and improved some liver function tests. We conclude that L-carnitine oral supplementation in patients on long term parenteral nutrition is effective and have a positive impact on liver function.

**Disclosure of Interest:** None declared.

#### MON-PO546

##### PREVALENCE AND DETERMINANTS OF EATING DISORDERS AMONG HIGH SCHOOL ADOLESCENT FEMALES IN GHARBIA GOVERNORATE, EGYPT

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**Rationale:** Eating disorders are serious illnesses, particularly among adolescent girls with an excessive concern about body weight and shape, that requires screening for prompt interventions.

**Methods:** A cross-sectional study conducted during two academic years 2016–2018, included 800 high school adolescent females, recruited from two school in Tanta City and one rural school in Gharbia Governorate, Egypt. An interview questionnaires was used to collect the following data: sociodemographic characteristics and anthropometric profile using BMI for age percentile. The Eating Attitude Test (EAT-26) was used to assess the attitudes, behavior and traits associated with eating disorders. Body image satisfaction was measured using the 34-item Body Shape Questionnaire (BSQ-34). Descriptive statistics, chi-square and logistic regression were performed for data analysis.

**Results:** According to EAT-26 test. the prevalence of positive screening of eating disorders was 35.5% ( $n = 284$ ). Logistic regression analysis unveiled that the significant independent predictors of eating disorders were low educational level of parents ( $OR: 1.6$  for fathers, 3.5 for mothers), worker mothers ( $OR: 6.6$ ), increased body weight ( $OR: 2.5$ ) for overweight/obese, and body shape dissatisfaction ( $OR: 4.9$ ).

Factor analysis of EAT-26 revealed that, three factors (preoccupation with thinness, perceived social pressure to gain weight, and food preoccupation) recorded the highest scores.

Table 1, demonstrated that overweight/obese adolescents dissatisfied with their body shape, significantly had higher score for EAT-26 scale ( $p = 008, p < 0.0001$ ). It also shows that all subscales of EAT-26 except social pressure to gain weight were significantly higher among adolescents who are dissatisfied with their body shape ( $p < 0.0001$ ).

**Conclusions:** Disordered eating attitudes and behaviors are prevalent among adolescent females at high schools. Periodic screening and specific management strategies targeting adolescents to correct the corporeal image misconceptions, unhealthy weight management and control eating behavior disorders are required.

**Disclosure of Interest:** None declared.

#### MON-PO547

##### DESCRIPTIVE STUDY OF NUTRITIONAL STATUS IN PATIENTS WITH ESOPHAGEAL CANCER. ACCORDING TO THE NEW GLIM CRITERIA

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**Rationale:** The prevalence of malnutrition in these patients is currently unknown; it is estimated to be 78.9%. Aim: know the nutritional status of patients diagnosed with esophageal cancer in our environment at the time of admission according to the new GLIM criteria (1).

**Methods:** The information was collected prospectively of all admitted patients diagnosed with malignant esophageal pathology from January 2016 to December 2018. Urgent and scheduled admissions were included. A complete nutritional assessment was carried out: anthropometry (current weight, usual weight in the last 3 months and height), malnutrition risk screening was carried out through MUST and NRS2002 test and nutritional diagnosis was made according to the GLIM criteria. Also albumin, prealbumin and c-reactive protein.

**Results:** 44 patients, 86.4% were males, with a mean age of  $64.5 \pm 11.7$  years, the median hospital stay was  $16.5 \pm 13.5$  days and 72.7% were scheduled. Adenocarcinoma or carcinoma: 40 91%, GIST: 3 6.7% TNE: 1 2.3%, 86.4% were operated 38/44.

The nutritional screening with MUST and NRS2002 showed a high risk of malnutrition of 86.4% and 77% respectively. Following the GLIM

**Table 1** (abstract: MON-PO546): Eat-26 and its comprising subscales in relation to BMI and body shape satisfaction between studied adolescent females.

Eat-26: psychometric subscale	Preoccupation with thinness	Dieting	Social pressure to gain weight	Bulimia	Food preoccupation	Overall Eat-26 score
<b>BMI</b>						
- Underweight	5.008 ± 2.7	3.18 ± 3.6	5.16 ± 3.37	0.8 ± 1.7	2.2 ± 2.4	15.3 4 ± 12
- Normal weight	5.32 ± 3.75	2.13 ± 2.4	4.77 ± 6.06	1.93 ± 2.7	3.06 ± 2.5	18.28 ± 11.8
Overweight/obese	6.9 ± 3.6	2.5 ± 2.6	1.78 ± 1.9	2.3 ± 2.4	5.2 ± 3.8	19.1 ± 10.5
Test of significance	11.24 <sup>a</sup>	6.2 <sup>a</sup>	141.9 <sup>b</sup>	53.02 <sup>b</sup>	56.5 <sup>a</sup>	4.81 <sup>a</sup>
p-value	0.0001*	0.002*	<0.0001*	<0.0001*	<0.0001*	008*
<b>Perceived body shape</b>						
- Satisfied	0.14 ± 5.7	2.18 ± 2.9	4.75 ± 5.8	0.91 ± 1.94	2.53 ± 2.5	14.53 ± 10.8
- Dissatisfied	7.19 ± 3.4	3.31 ± 3.2	2.9 ± 3.7	2.72 ± 2.7	4.62 ± 3.5	20.86 ± 9.5
Test of significance	3.86 <sup>a</sup>	3.35 <sup>a</sup>	31.6 <sup>b</sup>	90.193 <sup>b</sup>	40.7 <sup>a</sup>	8.75 <sup>a</sup>
p-value	<0.0001*	<0.0001*	<0.0001*	<0.0001*	<0.0001*	<0.0001*

<sup>a</sup>F ANOVA test.

<sup>b</sup>Kruskal Wallis Test.

\*Significance.

criteria, 75% were malnourished and 36.4% had severe malnutrition. The rest of the results are shown in the Table 1. Separated according to the stage of disease. The majority of the patients 61.4% had an advanced stage. 54.6% received neoadjuvant treatment and 20.5% patients had a stage IV of them 66.7% entered urgently and 89% met criteria of malnutrition; 5 (55.5%) were operated to place a nutritional access route and 2 metastasis stents.

	GLOBAL	INITIAL STAGE	ADVANCED STAGE	STAGE IV
% Average LOSS WEIGHT	9	7,5	8	14,5
NRS 2002	34(77,2%)	5	21	8
MUST	39(86,4%)	6	25	8
GLIM	33(75%)	4 50%	19 70,4%	8 89%
Moderate	17 (38,6%)	1	11	2
Severe	16 (36,4%)	3	8	6
N	44	8	27	9
%	100	18,2	61,4	20,5
IQ	38	8	26	5
%	86,3	100	96,2	55,5

**Conclusions:** The incidence of malnutrition according to the new GLIM criteria in patients with esophageal malignant pathology is 75% in 36.4% the malnutrition is severe, even half of the patients with initial stages are malnourished.

#### Reference

1. Cederholm T, Jensen GL, Correia MITD, *et al.* GLIM Working Group. GLIM criteria for the diagnosis of malnutrition – A consensus report from the globalclinical nutrition community. *Clin Nutr.* 2019 Feb;38(1):1–9.

**Disclosure of Interest:** None declared.

#### MON-PO548

##### INCIDENCE AND GRADE OF MALNUTRITION ON PATIENTS WITH GASTRIC CANCER

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**Rationale:** Despite the great incidence of malnutrition in hospitalized patients, only recently has been reached a consensus for the evaluation, diagnosis and classification of nutritional status. Aim: know the incidence and grade of malnutrition on patients with gastric cancer in our environment at the time of admission according to the new GLIM criteria.

**Methods:** The information was collected prospectively of all admitted patients diagnosed with gastric cancer from July 2016 to December 2018. On admission, during the first 24 h, nutritional risk screening was performed with validated test and height and weight were collected (current and six month ago). According with the new GLIM criteria, these patients were classified according to their nutritional status. Once the risk of malnutrition is considered, we can establish the diagnosis when there is an etiological factor (in this case, every patients have the disease/inflammation factor) and a phenotypic criterion (weight loss >5% in the last 6 months, BMI <20 in younger than 70 years-old or <22 in elder than 70 years-old, or loss muscle

mass). According to the presence and severity of the phenotypic factors, malnutrition is classified as moderate or severe. The descriptive statistic was carried out with SPSS 24.

**Results:** We evaluated a sample of 101 patients (65 men and 36 women) aged between 44 and 88 years old (mean 71,84 years-old). The median of hospital length stay was 10 days. 96% of the patients were operated. According to ESPEN recommendations, some of the validated malnutrition screening methods were performed upon admission; malnutrition risk is presented in 64,94% of the cases (63/101). 54,27% met diagnostic criteria for malnutrition. 20,83% (20 patients) presented moderate malnutrition and 29,16% (28 patients) presented severe malnutrition.

**Conclusions:** More than a Half of patients (54,3%) diagnosed with gastric cancer presented criteria for malnutrition upon admission. Almost in the 30% the malnutrition is severe.

#### Reference

1. Cederholm T, Jensen GL, Correia MITD, *et al.* GLIM Working Group. GLIM criteria for the diagnosis of malnutrition – A consensus report from the globalclinical nutrition community. *Clin Nutr.* 2019 Feb;38(1):1–9.

**Disclosure of Interest:** None declared.

#### MON-PO549

##### #INSTADIET – CAN SOCIAL MEDIA BE A RELIABLE SOURCE OF INFORMATION ON NUTRITION AND DIETETICS

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**Rationale:** Social media are growing, worldwide platforms for unlimited exchange of various content. Thanks to their accessibility and short form they can be used as an easy, wide-range communication and information tool for companies, scientific communities, patient advocacy organizations as well as special interest groups. The aim of this study was to see whether Instagram® profiles can be a reliable source of information and knowledge about nutrition and dietetics.

**Methods:** Random identification of nutrition-related posts was performed using built-in website search engine. Posts were searched by 5 popular hashtags, 250 newest posts of each. Advertisement posts were discarded. Each eligible post was then categorized (dietetics, fitness, motivation, other) and assessed with regards to quality of nutrition information provided (grades 0–3; 0 – very low, 3 – good quality), popularity (number of followers, likes and comments) and engagement measures (like, comment and engagement ratio).

**Results:** A total of 1190 posts were reviewed. Most of these, 63,8% were categorized as 'dietetic'. 'Fitness', 'motivation' and 'other' categories stood for 8,2%, 4,8% and 23,2% respectively. The overall quality of the content in terms of nutritional knowledge was very low (median n = 0), also when divided into categories. Dietetic posts were the most liked (mean n = 116 likes per post) and of highest quality, however those motivational and fitness raised biggest engagement (33% and 22% respectively) and number of followers (n = 4356 and n = 3451 respectively).

**Conclusions:** Random post search cannot be treated as valuable source of nutrition information. Dedicated search of high-quality professional profiles is preferred to obtain quality information.

**Disclosure of Interest:** None declared.



### MON-PO550 SCREENING OF EATING DISORDERS USING THE SCOFF-F AMONG 964 ACTIVE WORKERS AND STUDENTS

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**Rationale:** Eating disorders (ED) including anorexia nervosa (AM), bulimia nervosa (BN), binge eating disorder (BED) and night-eating syndrome (NES) are severe psychiatric and nutritional disorders. ED screening can be realized with the SCOFF-F. The aim of our work was i) to detect ED using SCOFF-F among students and active workers in the French county of Haute-Vienne ii) to research factors associated with a positive SCOFF-F.

**Methods:** This prospective study was conducted during 5 months in 6 departments of Occupational Medicine and a Department of University Medicine. Using an anonymous self-questionnaire of the declarative data concerning the age, the body mass index (BMI), the presence of ED, the physical activities were collected. The SCOFF-F was also realized (positive if 2 positive responses on 5). Statistical analysis included Student's t-tests, Chi2, and logistic regression.

**Results:** 964 people with a mean age of 34.3 ± 12.6 years old were included. Mean BMI was 24.4 ± 4.6 kg/m<sup>2</sup>, with 4.7% undernourished and 12.2% obese. 26.7% of people were students. People reported AM, BN, BES, and NES in 2.5%, 4.0%, 3.6%, and 2.8% of cases, respectively. The SCOFF-F was positive in 13.7% of the cases, and more frequently in the students (46.9% vs 23.6%, p < 0.0001). In multivariate analysis, lower age, women, higher BMI, high-level sport activity, quality of life impaired by disorders, and reported ED were positively associated with positive SCOFF-F (OR = 1.03, p = 0.01, OR = 2.17, p = 0.009, OR = 1.09, p = 0.002, OR = 3.00, p = 0.002, OR = 5.3, p < 0.0001 and OR = 4.20, p < 0.0001 respectively). For reported TCA positive SCOFF-F was more specifically associated with BN and NES (OR = 4.6, p = 0.001 and OR = 5.64, p = 0.002 respectively).

**Conclusions:** Our study provides the first data on the screening of ED in adults in the county of Haute-Vienne. The SCOFF-F screened 14% of ED, which is consistent with the literature. In our population, it seems more specifically positive in case of BN and NES reported by the people. Even if we did not find an association according to the socio-professional status, the students remain at risk of ED which is easy to screen in University Medicine with the SCOFF-F.

**Disclosure of Interest:** None declared.

### MON-PO551 CHARACTERISTICS OF HOSPITALIZED ADULT PATIENTS USING ORAL NUTRITION SUPPORT AT A TERTIARY REFERRAL CENTER IN MEXICO CITY

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**Rationale:** Hospitalized patients usually reduce food intake due to sickness, thus the use of oral nutritional supplementation (ONS) can be useful to prevent malnutrition associated with adverse outcomes. Therefore, the aim was to describe the clinical and nutritional characteristics of hospitalized patients with ONS at a tertiary referral centre in Mexico City (INCMNSZ).

**Methods:** The study was conducted in hospitalized adult patients at the INCMNSZ in April 2018. NRS-2002 was performed during the first 24 h of hospitalization, and medical nutrition therapy was prescribed for those who needed it. The patients with ONS were followed for 4 days in which anthropometric and dietary measurements were performed: weight, body mass index (BMI), handgrip strength, 24 h dietary recall, the adherence to the prescription and tolerance. Quantitative continuous variables were expressed as mean ± SD. Categorical variables were summarized using frequencies and percentages. Paired t-test was used to compare related samples (day 0 vs 4) and Chi-square test for categorical variables. P value less than 0.05 was considered statistically significant.

**Results:** A total of 293 patients were eligible and the main diagnosis was cancer (31%), half of the total population had nutritional risk and only 10.2% had ONS. The ones with ONS 70% were females, were 56 ± 22 years old, BMI 21.3 ± 4.5 kg/m<sup>2</sup>, and 83% had nutritional risk. There was a statistically significant increase in the energy (73% vs 90%) and protein (77% vs 94%) intake, and 60% of patients were reached in the estimated energy requirements (66% vs 90%). Standard enteral formulas were used in 57% of the patients, 73% consumed >50% of the ONS prescribed, and only 3% reported nausea.

**Conclusions:** In hospitalized adult patients who do not meet their requirements with the diet, the ONS is a good option to increase the energy and protein with good acceptance and tolerance.

**Disclosure of Interest:** None declared.

### MON-PO552 THE ASSOCIATION BETWEEN SMOKING AND AGE RELATED MACULAR DEGENERATION

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**Rationale:** Age-related macular degeneration (AMD) is one of the main socioeconomic health issues worldwide. AMD has a multifactorial etiology with a variety of risk factors. Smoking is the most important modifiable risk factor for AMD development and progression. The association between smoking and AMD has been consistently demonstrated in many epidemiological studies carried out within different populations in the last decades confirming previous clinical impressions.

**Methods:** Total 200 (100 study group, 100 control group), >50 years old participants in Hacettepe University are attended to the study. Demographic data were assessed by a standardized interviewer-assisted questionnaire with the method of face-to-face interview. The socio-demographic features of individuals (gender, age, occupation, educational status, health conditions), use of cigarettes and drugs was questioned. The individuals under 50 years old, who had special nutrition conditions, cardiovascular diseases and eye surgery history were not included in the study.

**Results:** When the individuals in the case group were analyzed in terms of smoking, it was found that 54.0% of them were smokers, and 46.0% of them never smoked. In the control group, it was found that 24.0% of individuals were smokers, and 76.0% of them never smoked. There was a statistically significant difference between these two groups in terms of smoking and the smoking rate in the case group was found to be higher than the control group (p < 0.001). The mean duration of smoking was 30.6 ± 14.6 years in the case group and

29.3 ± 12.3 years in the control group and no statistically significant difference was found between the two groups ( $p > 0.05$ ). Also in a multivariate analysis, smoking (odds ratio (OR): 6.59,  $p = 0.021$ ) was identified as risk factors for developing AMD.

**Conclusions:** Consequently, in our study, as has been previously studies, smoking by itself promotes development of AMD. However, patients are not frequently aware of the significant role played by cigarette smoking in blindness associated with AMD. Sometimes, even physicians forget about advising patients of the relevance to quit smoking. Quitting smoking reduces the risk of AMD. Countries should show health warnings on cigarette packets related to this issue ('SMOKING CAUSES BLINDNESS').

**Disclosure of Interest:** None declared.

### MON-PO553 HOME ARTIFICIAL NUTRITION (HAN) IN A SOUTHERN ITALY LOCAL HEALTH CARE UNIT (LHCU).

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**Rationale:** HAN prescription is a safe and steadily increasing practice for non-hospitalized patients who needs nutritional support. Aim of the study was to evaluate patients characteristic and prescriptions in 2018 at HAN Unit of LHCU 'Napoli 3 Sud', Naples, Italy.

**Methods:** Retrospective evaluation of data collected from 3695 HAN patients (M=1509, F=2186) registered from January 1<sup>st</sup> to 31 December 2018. In addition to Home Parenteral Nutrition (HPN), Home Enteral Nutrition (HEN) and Home Intra-Venous Fluids (HIVF), Oral Nutritional Supplements (ONS) prescriptions has been included.

**Results:** The majority (96%) of HAN patients were adults (>18 years), with the highest percentage aged over 70 years (75.5%). ONS represented 65.2% of HAN prescriptions, mostly for swallowing disorders and disease-related malnutrition (data not shown). The prevalence of parenteral support (HPN+HIVF; 548) was 14.8%, prescribed mainly to cancer patients (62.6%). Patients on HEN were 409 (11.1%) and 76.5% had neurological disease; Percutaneous Endoscopy Gastrostomy (PEG) was the prevalent route of feeding (52.9%) then nasogastric tube (44.5%); less common was jejunostomy (2.6%). Patients on mixed HAN (HPN/HIVF + HEN/ONS) were 300 (8.1%). The largest diagnostic category for HAN patients was neurological disease (2308, 62.5%); vascular disorders and brain injuries contributing for 55% and degenerative disorders 33.5%. About 26% of HAN patients were oncological: 374 had Gastro-Intestinal (GI) cancer (38%); lung (15.6%) and head-neck cancer (8.3%) followed. Benign GI diseases, including IBDs and GI surgery, accounting for 5% of HAN prescriptions.

**Conclusions:** Elderly patients represented the largest HAN population. Main HAN prescription in 2018 was ONS. Use of parenteral support as 'palliative care' could probably explain high HPN and HIVF prescriptions [1].

#### Reference

1. Pironi *et al.* Development of home artificial nutrition in Italy over a seven year period: 2005–2012. *BMC Nutrition* (2017) 3:6.

**Disclosure of Interest:** None declared.

### MON-PO554 INVESTIGATION ON THE CONSTRUCTION AND MANAGEMENT OF NUTRITION DEPARTMENT IN TERTIARY HOSPITALS IN FUJIAN PROVINCE OF CHINA

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**Rationale:** China issued the National Nutrition Plan (2017–2030) in 2017, which identifies clinical nutrition as one of six major actions, emphasizing the importance of clinical nutrition in achieving the goal of healthy China. With the increasing demand for nutritional therapy in clinical practice, there are higher requirements for the hardware, allocation and staffing of clinical nutrition department. Therefore, it is the necessary to understand the current situation and problems for improving the nutrition status and health condition.

**Methods:** A cluster sampling method was used to investigate the current situation and main problems of the construction and management of clinical nutrition department in tertiary hospitals in Fujian Province by questionnaires in medical institutions from October to November in 2018.

**Results:** Total 46 tertiary hospitals were participated in the questionnaires. There were differences in the management attribution of clinical nutrition departments, belonging to clinical department, medical technology department and back office, respectively, with non-standard names of departments. The nutrition professionals and facilities were insufficient. The clinical diagnosis and treatment of nutrition were not fully developed, with less than 50% hospitals carrying out nutrition ward-rounds, outpatient clinics, medical records, and nutrition risk screening, etc. Less than 15% of hospitals has carried out nutrition-related teaching and research.

**Conclusions:** The construction and management of clinical nutrition department is inadequate in tertiary hospitals in Fujian Province. Hospital managers should attach more importance to it by improving the equipment and staffing and strengthening the quality control to promote the development of clinical nutrition work.

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### MON-PO555 MEDITERRANEAN DIET ADHERENCE SCORE AS INDICATOR FOR PREDIABETES IN TAIWAN

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**Rationale:** The Mediterranean diet has long been considered a healthy eating pattern that decreases the risks of chronic diseases such type 2 diabetes. Prediabetes is the high-risk state for diabetes where the patients can revert to being healthy via life style changes or interventions.

**Methods:** This study analyzes Mediterranean diet adherence scores of prediabetes patients in order to see if the 14-item questionnaire can be used as an indicator for hyperglycemia. A total of 119 prediabetes patients in Taiwan enrolled in this study.

**Results:** We found significance in gender, cholesterol, sugar, and DHA in terms of the adherence score. No significance was found in glucose

**Table 1** (abstract: MON-PO555): Multivariable-adjusted odds ratios (OR, 95% confidence intervals) for AC and HbA1C according to the fulfilment of each item included in the 14-point screener of adherence to the Mediterranean diet.

14-point screener of adherence to the Mediterranean diet	% positive at recruitment	AC		HbA1C	
		OR (95%CI)	p	OR (95%CI)	p
1. Use of olive oil as main culinary lipid	3.36%	0.46 (0.04–5.18)	.526	536525941.01 (0.00 – NA)	.999
2. Olive oil >4 tablespoons	0.84%	446424639.79 (0.00 – NA)	1.000	707623346.94 (0.00 – NA)	1.000
3. Vegetables $\geq 2$ servings/d	13.45%	2.18 (0.24–19.59)	.485	1.04 (0.31–3.50)	.955
4. Fruits $\geq 3$ servings/d	11.76%	1.29 (0.14–11.54)	.819	1.03 (0.25–4.16)	.970
5. Red/processed meats <1/d	80.67%	1.45 (0.35–6.01)	.613	1.79 (0.66–4.89)	.254
6. Butter, cream, margarine <1/d	94.96%	0.00 (0.00 – NA)	.999	5.86 (0.98–34.94)	.052
7. Soda drinks <1/d	76.47%	0.67 (0.13–3.39)	.629	1.04 (0.38–2.83)	.943
8. Wine glasses $\geq 7$ /wk	3.36%	119295180.26 (0.00 – NA)	.999	0.22 (0.03–1.75)	.152
9. Legumes $\geq 3$ /wk	2.52%	0.06 (0.00–0.76)	.030	1.03 (0.08–13.87)	.980
10. Fish/seafood $\geq 3$ /wk	2.52%	251062931.25 (0.00 – NA)	.999	1.11 (0.09–14.35)	.938
11. Commercial sweets and confectionery $\leq 2$ /wk	69.75%	1.18 (0.32–4.37)	.810	0.74 (0.28–1.95)	.536
12. Tree nuts $\geq 3$ /wk	3.36%	203202786.91 (0.00 – NA)	.999	1.13 (0.11–11.60)	.919
13. Poultry more than red meats	30.25%	0.46 (0.04–5.18)	.526	536525941.01 (0.00 – NA)	.999
14. Use of sofrito sauce $\geq 2$ /wk	9.24%	446424639.79 (0.00 – NA)	1.000	707623346.94 (0.00 – NA)	1.000

and HbA1c levels compared with adherence scores. Upon closer analysis, most single pointers except for legumes and butter/cream/margarine have no significant effect.

**Conclusions:** From our results we conclude that the Mediterranean diet adherence score is not an effective indicator in the context of low Mediterranean diet adherence score. Partial adherence to the Mediterranean diet provides little benefit compared to the full benefits shown in literature.

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**Disclosure of Interest:** None declared.

## Nutritional techniques and formulations II

### MON-PO556

#### THE INVENTION OF TONGUE COVER TO REDUCE DISCOMFORT DURING INTAKE OF ORAL NUTRITIONAL SUPPLEMENTS

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**Rationale:** Oral nutrition supplementations are provided to patients who have inadequate or unable to take nutrition. However, there are many cases where patients refuse to take because of the fact that the supplements are not delicious. Nutrient manufacturers have added various flavors such as fruits and soups, but the situation is not satisfactory. Our object is to provide a tongue cover that can reduce unpleasant feeling upon intake.

**Methods:** We tried to make a thin film that cover the whole tongue to reduce taste feeling. We looked for edible materials for safe in use.

**Results:** The tongue cover is composed of two films. An upper film covers the upper surface of the tongue and a lower film does the tip portion of the tongue. We used gelatin, glycerin and others that can

melt a few minutes after they are attached to the tongue, and easily break when ingested. In addition, it is safe to swallow the cover during use or after use as it is edible.

**Conclusions:** The tongue cover can facilitate long-term nutrient intake. In addition, it is possible to reduce pain and discomfort at the time of medication in patients suffering from pain due to glossitis and stomatitis, and also to reduce discomfort at the time of intake due to bitterness of the mouth. The tongue cover made of edible materials seemed to be useful in clinical practice.

**Disclosure of Interest:** None declared.

### MON-PO557

#### FIRST RESULTS ON RADIOLOGIC PERCUTANEOUS GASTROSTOMY AT OUR CENTER

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**Rationale:** In recent years radiologic percutaneous gastrostomy (RPG) is increasing due to the shorter procedure, simplicity, low cost and low morbidity. In 2016, members of Nutrition and Interventional Radiology Units at our Hospital agreed to routinely introduce RPG in clinical management of patients at risk of malnutrition.

**Methods:** Descriptive study of GPR performed at our Center from 2016 to 2018. We recorded the following variables: gender, age, procedure date, cancellations and its cause, indications, length of hospital stay, enteral nutrition start and complications.

**Results:** We received 33 requests for RPG, 23 of which were finally performed: 2 (8,7%) in 2016, 5 (21,7%) in 2017 and 16 (69,6%) in 2018. Causes of cancellations were: patient decease in 2 (20%) cases, loss of eligibility criteria in 4 (40%) and other reasons in 4 (40%). In 91,7% of the cases were the first radiological gastrostomy, and in 8,3% were feeding tube replacement. Mean age of the patients was 62 years (SD 7,58) and 73,9% were men. Main indication (52,1%) was dysphagia (neurological in 39,1% and organic in 13%), followed by prophylactic RPG (43,5%). Median of stay length in Hospital was 1 day (range 1–21). We initiated enteral diet in the 12 hours after RPG in 5% of the patients; between 12–24 hours in 20% and beyond 24 hours in 75%. There were major complications in 2 cases (8,7%): 1 gastrostomy tube malposition, with instilled nutrition into peritoneal cavity and 1 gastric bleeding that required transfusión. And 13% of minor complications during the first 6 months.



**Conclusions:** RPG in our Center has experienced exponential growth in the last 3 years.

Dysphagia is still main indication, but we have a relevant percentage of prophylactic stenting.

We should begin enteral nutrition before 24 hours after RPG if possible.

**Disclosure of Interest:** None declared.

#### MON-PO558

##### COST-BENEFIT ANALYSIS OF USING AUTOMATIC COMPOUNDING DEVICES IN TPN PREPARATION IN TAIWAN

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**Rationale:** Total parenteral nutrition (TPN) formulations are parenteral nutrition tailored to patients' nutritional needs. Before the introduction of fully automatic compounding devices (ACD), TPN was prepared with manual dispensary. The automata have been able to cut down time and improve patient safety; however, the tubing cost and residual drug are much higher compared to manual dispensing. In order to understand the cost and economic benefit of switching to ACD, further analytical study was conducted.

**Methods:** Cost comparison between manual modulation using conventional method and ACD modulation (Baxter, EM2400). Additional effectiveness of the different modulations used is also considered in this analysis.

**Results:** The National Health Insurance in Taiwan reimburses NT\$365 per TPN bag. The daily pipeline cost is about NT \$5,000 and cost for the residual drug is about NT \$790. To balance these cost, 15 bags have to be allocated. Cost analysis shows the expenditure of using ACD is about NT \$379,601 per month. Profit-wise, ACD is 1.4 times higher than manual modulation (about NT \$59,510 per month). The introduction of automatic modulation increases the number of TPN prepared by about 40%. Accounting for no additional increase in manpower, extra preparations in eye drops and pediatric TPN can be achieved, which in turn improve institutional efficiency and increase surplus. The expenditure of pediatric TPN is about NT \$24,941 per month. Because of the manpower saved, we can prepare about additional 50 bottles of eye drops in one hour.

**Conclusions:** Compared with the human errors that can be generated by manual modulation, the ACD safer, more economically beneficial, manpower savings, more profitable and most importantly adds extra values to the institution. In the future, these additional benefits can provide more opportunities to design more nutritional formulas for different ethnic groups to meet the requirements of clinicians and to provide safe and effective PN treatment to patients.

**Disclosure of Interest:** None declared.

#### MON-PO559

##### BACTERIAL CONTAMINATION DURING CONTINUOUS ADMINISTRATION OF A STERILE LIQUID ENTERAL NUTRITION FORMULA IN A STERILE SEALED BAG: A PROSPECTIVE INTERVENTIONAL STUDY.

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**Rationale:** The European Society for Clinical Nutrition and Metabolism has not yet provided any suggestions concerning bacterial contamination during the administration of enteral nutrition (EN) formula via a feeding tube. On the other hand, the American Society for Parenteral and Enteral Nutrition states that EN formula should be used within 8 hours. However, in our experiment, there was no evidence of bacterial contamination during continuous administration of EN in a sterile sealed bag even up to 24 hours. We attempted to clarify the actual degree of bacterial contamination of EN formula during daily use in critically ill patients.

**Methods:** A single-institution, prospective study. Patients who were over twenty years old and received 24-hour continuous EN in a sterile sealed bag between December 2016 and July 2018 at the intensive care unit were enrolled in the study. A 3-ml sample of the EN formula was collected for bacterial culture every four hours from the sterile bag that hung on the side of the patients' beds. Culture dishes were incubated at 35°C for 48 hours prior to evaluation. The primary endpoint of the study was detection of bacterial colonies and the secondary endpoints were the presence of gastroenteritis, the stool score as defined by King's stool chart, and the volume of fluids draining via the nasogastric tube over a period of 24 hours.

**Results:** A total of 630 specimens were collected for culture from a total of 30 patients. No bacterial colonies were detected. None of the patients developed gastroenteritis, the stool score on King's stool chart was 0, and the gastric aspirate volume was 0 ml.

**Conclusions:** There was no bacterial contamination during continuous administration of a sterile liquid EN formula in a sterile sealed bag for up to 24 hours at a clinical site. Thus, a 24-hour hang time of the EN formula can be allowed for patients receiving continuous EN in the intensive care unit. A multicenter trial is necessary to confirm our data.

**Disclosure of Interest:** None declared.

#### MON-PO560

##### STERILITY TESTING OF TOTAL PARENTERAL NUTRITION SOLUTIONS

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**Rationale:** Total parenteral nutrition (TPN) is a high-risk factor for bloodstream infections (BSI), as its high nutrient content provides a suitable culture media for microorganisms. The manufacturing of individualised TPN solutions implies further technical manipulation compared to 3-chamber bags, thereby increasing the risk of contamination. Thus, it is essential to ensure aseptic conditions during the preparation process to guarantee the sterility of these admixtures and prevent potential BSI. The aim of this study was to assess the sterility of individualized TPNs compounded in horizontal laminar flow hoods following GMPs in the Pharmacy Department of a University Hospital.

**Methods:** Sterility of TPNs was assessed by means of a validated 0.45-µm membrane filtration method (1). A randomised sample of 50 mL was taken every 45 bags according to the cumulative sum control charts and, after its filtration, the membrane was transferred to a blood-agar medium. An additional 20 mL sample was taken to be used as a control in case of a positive result.

**Results:** Between 2012 and 2018, 47,975 bags were prepared. Among them, 1,071 were randomised for testing. The results of the agar blood cultures are detailed below.

Bags tested (year)	Agar blood cultures results
129 (2012)	All negative
144 (2013)	One TPN was reported to be contaminated with coagulase-negative <i>Staphylococci</i> . The control sample was negative.
147 (2014)	One TPN was reported to be contaminated with <i>Pseudomonas fluorescens</i> . The control sample was negative.
188 (2015)	All negative
161 (2016)	All negative
159 (2017)	All negative
143 (2018)	All negative

Bacterial growth was observed only on two filters (0.2% of the samples), but the negative results of the subsequent controls indicated accidental contamination during the filtration process and/or the manipulation of the samples.

**Conclusions:** Our study demonstrates the sterility of the TPNs prepared in the Pharmacy Department. The lack of contamination reveals that the Quality Management System for our Production Unit is effective.

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**Disclosure of Interest:** None declared.

#### MON-PO561

##### STANDARDIZED COMMERCIAL PARENTERAL NUTRITION WITH EXTRA NITROGEN FORMULATIONS PRESCRIPTION IN A TERTIARY HOSPITAL

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**Rationale:** Clinical nutrition guidelines recently increased protein requirements for parenteral nutrition (PN). Therefore, the first standardized commercial parenteral nutrition (SPN) formulations do not reach the nutritional needs for some patients. The new extra nitrogen SPN (ENSPN) were commercialized to fulfil them. The goal of this study is to analyse the extra protein addition to SPN before and after the inclusion of ENSPN in a Hospital Drug Formulary and its impact in the amount of time needed for the preparation process in the Pharmacy Department.

**Methods:** Descriptive, retrospective study in a tertiary hospital. Patients admitted from March 2018 to March 2019 who needed PN were included and divided in two groups: before the inclusion of ENSPN in the Hospital Drug Formulary (from March 2018 to October 2018) and after the inclusion (from November 2018 to March 2019). Demographic and clinical variables were registered. Data was collected from medical records and analysed with STATA<sup>®</sup>14.

**Results:** A total of 424 patients were included, 261 before the implementation of ENSPN (first group) and 163 after the implementation (second group). There was no statistical difference regarding neither gender nor age between both groups. Parenteral nutrition was administered an average of 13.8 days (95%CI 10.9–16.8) in the first group and 10.8 days (95%CI 9.5–12.1) in the second ( $p = 0.1304$ ). A total of 3519 PN were prepared during the first period and 1866 during the second. The addition of external proteins was needed in 38.2% (1344/3519) before the inclusion of ENSPN, and only in 16.8% (313/1866) after, which represents a 21.4% reduction ( $p = 0.000$ ). Critical Patients Unit (24.6%), Oncology and Haematology Unit (22.3%) and

Resuscitation Unit (20.1%) were who most prescribed ENSPN. If we estimate an average of 6 minutes for each extra protein addition to SPN, and taking into account a 21.4% reduction of it after the inclusion of ENSPN, the PN preparation time was decreased an average of 2.23 h per week.

**Conclusions:** The use of ENSPN allows reducing extra protein addition to SPN. These new formulations are helpful to fulfil protein requirements in patients on which traditional SPN do not adjust properly. Moreover, ENSPN permits a significant reduction in PN preparation time with direct consequences in the use of resources.

**Disclosure of Interest:** None declared.

#### MON-PO562

##### REDUCTION IN HEALTH CARE UTILIZATION WITH TRANSITION TO PEPTIDE BASED DIET IN INTOLERANT HOME ENTERAL NUTRITION PATIENTS

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**Rationale:** Since introduction of percutaneous endoscopic gastrostomy in the 1980's, the prevalence of enteral nutrition support has increased significantly. Despite these increases, many patients are unable to tolerate standard polymeric formula (SPF) resulting in significant health care resource utilization. Peptide based diets (PBD) have emerged as a viable option in SPF intolerant patients, however data in Home Enteral Nutrition (HEN) is lacking.

**Methods:** Retrospective review of our prospectively maintained HEN database was conducted to assess tolerance, efficacy, and impact on health care utilization in patients on PBD.

**Table 1**

Results for HEN patients intolerant to SPF.

Characteristic (n = 43)	On standard polymeric Feed	On Peptide Based feed	P-value
Nausea/vomiting n(%)	17 (40%)	10 (23%)	0.021
Diarrhea	20 (47%)	10 (23%)	0.0023
Abdominal pain/Cramping	10 (23%)	2 (5%)	0.0114
Abdominal distention	4 (9%)	1 (2%)	0.1797
Average number of patient-initiated phone calls	1.8 ± 1.65	1.1 ± 1.0	0.0051
Average number of visits to ER	0.3 ± 0.6	0.09 ± 0.3	0.0273
Average number of provider visits	1.3 ± 1.3	0.3 ± 0.5	≤0.0001

**Results:** From January 1<sup>st</sup>, 2016 to May 1<sup>st</sup>, 2018, 98 patients were placed on PBD with 55 patients being started directly and 43 patients being transitioned from SPF. In patients transitioned to PBD, symptoms of nausea/vomiting, diarrhea, abdominal pain, and distention improved significantly. Health care utilization also declined significantly including mean number of phone calls (1.8 ± 1.65 to 1.1 ± 1.0,  $p$ -value 0.005), mean number of emergency room visits (0.3 ± 0.6 to 0.09 ± 0.3,  $p$ -value 0.03), and mean number of provider visits (1.3 ± 1.3 to 0.3 ± 0.5,  $p$ -value < 0.0001).

**Conclusions:** Overall, PBD was well tolerated and resulted in a significant improvement in symptoms of gastrointestinal distress and health care utilization in patients intolerant to SPF.

**Disclosure of Interest:** M. Mundi Grant/Research Support from: Nestle and Fresenius Kabi, S. Velapati: None declared, A. Kuchkuntla: None declared, R. Hurt: None declared.

### MON-PO563 RESULTS OF THE IMPLEMENTATION OF A VIRTUAL NUTRITIONAL CONSULTATION IN HUELVA'S POPULATION.

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**Rationale:** Descriptive analysis of the implementation of a nutritional teleconsultation as a communication tool between Primary Care (PC) and Clinical Nutrition and Dietetics Unit (CNDU) for the care of the population at risk with neurological pathology.

**Methods:** Descriptive and retrospective analysis. Data are collected from all patients who have been cited in nutritional teleconsultation from November 2017 to March 2019, the data collected from these patients and the treatment established are analyzed.

**Results:** Total of 181 patients, with an average age of 83,2 years, 23,8% are men and 76,2% are women. The main diagnosis of the most of the derivative patients are vascular dementia (37,5%) and Alzheimer's disease (32,5%). Average MNA 11,4 points (malnourished). Brachial circumference average 23,6 cm. Knee-heel distance average 45,3 cm. Mean height calculated 154,8 cm. Mean weight calculated 50,2 kg. Average BMI 20,8 kg/m<sup>2</sup>. Average albumin 3,4 g/dL. About nutritional diagnosis, 17,22% presented SGA-A, 67,22% SGA-B and 15,56% SGA-C. As established treatment, in 5% of the cases we advise dietary recommendations, in 11,1% nutritional recommendations with adapted diet, in 69,4% were prescribed ONS and in 14,5% of the cases enteral nutrition. It was necessary to request a new appointment to provide new data in 13,25% of cases.

**Conclusions:** The creation of virtual communication tools between PC and CDNU for the care of the population at risk with neurological pathology increases the detection of malnutrition and the introduction of nutritional treatment for these patients.

The introduction of a nutritional teleconsultation for the care of these patients achieves the accessibility of the patient and the family to the nutritional treatment in an agile and effective way.

**Disclosure of Interest:** None declared.

### MON-PO564 IMPACT OF COMPUTER CALCULATION PROGRAM FOR INDIVIDUALIZED PARENTERAL NUTRITION OF EXTREMELY LOW BIRTH WEIGHT (ELBW) INFANTS ON SELECTED CLINICAL PARAMETERS

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**Rationale:** Nutrition supply in the first weeks of life of preterm neonates is an essential part of medical care conditioning extrauterine growth and development. Quality of nutrition impacts significantly efficacy of treatment in critically ill neonates and recovery after surgery. Thesis of the study is that using computer software to apply TPN in ELBW newborns can improve growth, decrease morbidity and increase guidelines compliance.

**Methods:** Retrospective medical records analysis of 94 extremely low birth weight preterm infants admitted to NICU within 2 first days of life, born over a one-year period before (2013) and after (2016) introducing computer software for applying parenteral nutrition. Composition of PN at 1st, 3rd and 7th day of life was obtained. Growth was assessed based on difference in weight, head circumference and body length percentile on Fenton charts at two points of time.

**Results:** Mann-Whitney test showed that more energy, fluids, proteins, lipids and carbohydrates were administered at all time

points in computer-calculated group. In this group, lower NEC and conjugated hyperbilirubinemia morbidity at the level of statistical tendency were observed. Considering ESPEN/ESPGHAN Guidelines on paediatric parenteral nutrition (2005) there was no difference in compliance. However when compared with detailed recommendations by D.H. Adamkin (2008) there was a difference in lipid administration adequacy. At all time points computer-calculated group received appropriate amount of lipids and conventionally administered PN group didn't. In the computer-calculated group duration of PN was shorter (average 30,81 vs. 25,25 days).

**Conclusions:** Calculating PN via computer software increased administration of nutrients, shortened duration of PN and possibly lowered morbidity.

#### References

**Disclosure of Interest:** None declared.

### MON-PO565 USE OF PFAT5 TO EVALUATE ADMIXTURE COMPATIBILITY

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**Rationale:** Lipid emulsions are susceptible to instability when co-infused with concomitant medications and electrolytes. The optimal assay has been proposed as measurement of the PFAT5. The PFAT5 is defined by USP Chapter 729 as the percentage of fat residing in globules larger than 5 µm as measured by light obscuration. The lipid would be considered unstable if that value would exceed 0.05%. This preliminary study was undertaken to evaluate the use of PFAT5 technology in evaluating co-administered electrolytes.

**Methods:** A light-obscuration particle sizer HIAC 9703+ was calibrated for particles 1.8 to 50 µm. This study evaluated Intralipid<sup>®</sup> and SMOFlipid<sup>®</sup> for compatibility with Normal Saline and Magnesium Sulfate Solutions. Fat emulsion samples were transferred from manufacturer's containers into B Braun, Excel<sup>®</sup> plastic containers. One ml samples were removed from each mixture and evaluated initially and after 24 hours of exposure. Each sample was diluted with particle-free water (PFW) at 1:200 dilution. All tests were conducted in triplicate and reported as mean. The particle sizer system was rinsed with PFW three times and verified for system suitability according to USP 788 test between each sample.

**Results:** Each of the samples showed a slight increase in the PFAT5 after 24 hours in the polyolefin containers. It was expected than baseline would remain the same and that the addition of electrolytes would follow a pattern similar as the pattern shown in aggregation number theory, where high valence cations will have higher disruptive effects. The change was most pronounced in the SMOFlipid samples containing magnesium, but not with Intralipid mixed in an identical process.

	0	24	Change
SMOF	0.011	0.017	1.499206
S+NS	0.013	0.016	1.255363
S+Mg	0.019	0.047	2.462739
Intralipid	0.018	0.020	1.121033
I + NS	0.018	0.024	1.334504
I + Mg	0.018	0.022	1.195849

**Conclusions:** This preliminary study was undertaken to determine the feasibility of using light obscuration derived PFAT5 model as a tool in evaluating lipid compatibility. The lipid market is complex and there exists few studies that use validated means to determine the impact of co-infused medications. Future studies will evaluate a wide range of



medications and electrolytes, to ensure the safety of concomitant delivery.

**Disclosure of Interest:** None declared.

#### MON-PO566

### EVALUATION OF THE AMOUNT OF RESIDUAL LIPID EMULSION IN CHAMBERS OF FLUSHED TOTALLY IMPLANTABLE VENOUS ACCESS DEVICES USING FLUORESCENCE IMAGING

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**Rationale:** Flushing of totally implantable venous access devices is essential for the prevention of occlusion, which occasionally occurs during lipid emulsion dosing<sup>1,2</sup>). In this study, we succeeded in visualizing and quantifying the behavior of the lipid emulsion in totally implantable venous access devices after flushing, and we identified an effective flushing speed and flushing method.

**Methods:** A quantitative fluorescence imaging technique was used to evaluate the amount of residual lipid emulsion in port chambers. Chambers were filled with lipid emulsion containing indocyanine green and then flushed with 5 to 70 mL of normal saline to compare the residual amounts between intensities as visualized by quantitative fluorescence imaging and the turbidity of the solution recovered from the chambers. Chambers were flushed at various speeds (15–60 mL/min), with a time interval of 1 or 3 s between boluses, and with varying directions of flow.

**Results:** The residual amounts determined by fluorescence imaging did not differ from those calculated from the turbidity of the recovered solution. A lipid emulsion residue that cannot be visually confirmed in the port chamber was seen with fluorescence imaging. The slower the flushing speed, the more lipid emulsion that remained. When the flushing speed was 40 mL/min or more, 99.98% or more of the lipid emulsion was discharged by flushing with 20 mL of normal saline. Compared with continuous flushing, pulsatile flushing with either time interval did not decrease the residual amount. The areas well cleaned after flushing were oriented to the bevel-opening direction, but when the flushing speed was high, the entire area was uniformly cleaned. The residual amounts determined by fluorescence imaging did not differ from those calculated from the turbidity of the recovered solution. A lipid emulsion residue which can't be visually confirmed in the port chamber was revealed by using fluorescence imaging. The slower the flushing speed, the more lipid emulsion that remained. When the flushing speeds was 40 mL or more, the lipid emulsion of 99.98% or more was discharged by flushing with 20 mL of normal saline. Compared with continuous flushing, pulsatile flushing with either time interval did not decrease the residual amounts. The areas well cleaned after flushing were oriented to the bevel-opening direction, but when the flushing speed was high, entire area was cleaned uniformly.

**Conclusions:** Imaging with indocyanine green enables the visualization and quantitative determination of residual lipid emulsion in chambers after flushing. These findings suggest that, to reduce the residual amount of lipid emulsion in a chamber, fast and energetic flushing continuously, as opposed to pulsatile flushing, is of paramount importance.

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**Disclosure of Interest:** None declared.

#### MON-PO567

### THE EFFECT OF ENTERAL NUTRITION ON PATIENTS' QUALITY OF LIFE (QOL): A SYSTEMATIC REVIEW

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**Rationale:** Although enteral nutrition has been shown to promote nutritional status, improve wound healing, and enhance patients' quality of life (QoL), evidence of tube and feed complications and reduced QoL has also been reported. The aim of this systematic review is to evaluate the effect of enteral nutrition on patients' QoL, which is particularly relevant as the prevalence of patients on enteral feeding is increasing.

**Methods:** Three databases (EMBASE, Pubmed and PsycINFO) were searched for relevant articles based on Population, Intervention, Comparator, Outcomes (PICO) framework. The review was in line with PRISMA guidelines and involved the use of synonyms and medical subject headings. Search terms were combined using Boolean operators (AND/OR) and only eligible articles meeting the inclusion criteria were selected for the review.

**Results:** Fourteen articles which met the criteria were included. Three distinct themes emerged (the effect of early versus late enteral tube feeding on QoL; the QoL of patients on gastrostomy versus standard care, and the effect of enteral nutrition on QoL). Overall, nine studies reported improvement in the QoL of patients on enteral nutrition, while five studies demonstrated either no significant difference or reduction in QoL. Some factors which may have influenced these outcomes are differences in types of gastrostomy tubes; enteral feeding methods (including time patients spent connected to enteral feed/pump), and patients' medical conditions, as well as the generic and/or type of QoL measuring instrument used.

**Conclusions:** The majority of reviewed studies suggest that enteral nutrition is effective in improving patients' QoL. The use of enteral nutrition specific QoL measuring instruments is recommended for future research and improved management strategies including use of mobile enteral feeding pumps should further enhance patients' QoL.

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#### MON-PO568

### SELECTIVE IN VITRO ACTIVITY OF A MICROBIOTA ACCESSIBLE CARBOHYDRATES ON KEY BACTERIA FROM GUT MICROBIOME

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**Rationale:** Human Milk Oligosaccharides (HMOs) are unconjugated complex carbohydrates abundant in human milk. HMOs selectively serve as a source of energy for desired bacteria in the infant gut modulating mucosal barrier function and promoting immunological responses. We have developed an oligosaccharides based formulation containing up to 130 Microbiota Accessible Carbohydrates (MACs) mimicking the natural diversity and complexity of HMOs. Our aim was to investigate the ability of key bacteria from the gut to use the formulation GMX *in vitro*.

**Methods:** *Bifidobacterium bifidum* ATCC 11863, *B. animalis* subsp. *lactis* DSMZ 10140, *B. breve* ATCC 15700, *Lactobacillus acidophilus* ATCC 13651, *Akkermansia muciniphila* ATCC BAA835 and *Bacteroides*

*thetaitaomicron* ATCC 29148 were cultivated in liquid minimal medium (MM) supplemented with glucose, MM supplemented with the formulation GMX and MM without supplementation. Cultures were performed in 96-well plates in triplicate in anaerobiosis at 37°C and bacterial growth was measured by optical density (OD) at 600 nm after 24 h, 48 h, 72 h and 96 h.

**Results:** All the tested strains were able to grow better in MM with GMX in comparison with MM without supplementation. In *B. bifidum*, the maximum growth was reached after 96 h (OD = 0.704). However, in *B. animalis*, *B. breve* and *L. acidophilus* it was reached after 24 h (OD = 0.315, OD = 0.607 and OD = 0.713, respectively). The bacterial species exhibiting more growth after 24 h were *A. muciniphila* (OD = 1.292) and *B. thetaiotaomicron* (OD = 1.11).

**Conclusions:** MAC formulation GMX with a structural diversity similar to HMOs has the capacity to stimulate important components of the gut microbiota *in vitro*. Our MAC formulation could have the potential to serve as a source of energy and nutrients for desired intestinal bacteria helping to restore a healthy microbiota in patients with dysbiosis.

**Disclosure of Interest:** None declared.

#### MON-PO569

#### WHAT AND HOW MANY PATIENTS ARE MONITORED BY THE UMCG NUTRITIONAL SUPPORT TEAM FOR INTESTINAL FAILURE AND TRANSPLANTATION BECAUSE OF INITIALLY SHORT-TERM TOTAL PARENTERAL NUTRITION (TPN) AT HOME, ADMINISTERED BY A GROWING NUMBER OF PICC'S?

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**Rationale:** The Nutrition Support Team UMCG (consisting of dietitians, registered nurses, nurse practitioners and gastroenterologists) coordinates and monitors (since 2009) an increasing number of adult patients with initially short-term Total Parenteral Nutrition (TPN) at home for several indications. These are for instance fistulas and short bowel but also regards patients with intestinal failure awaiting ITx (as the UMCG is the only intestinal transplant center in the Netherlands) and therefore depend on long-term TPN. The administering by PICC instead of CVC is increasing in (initially) short-term TPN, whereas numbers of complications were not objectified yet.

**Methods:** In this retrospective overview we present numbers of a variable and growing group of adult patients, over the last two years, by exploring our electronic registration system.

**Results:** The number of patients with short term Home Parenteral Nutrition increased from 22 per year in 2017 to 41 per year in 2018, whilst the number of long term patients was 7 (in both years). Indications for TPN can be roughly divided into four groups, in which incidence accidentally differs per year, namely; fistulas (27% in 2017 and 34% in 2018), (functional) short bowel (23% in 2017 and 12% in 2018), poor enteral access (for example gastroparesis, stenosis esophagus and ileus) occurred with 9% of the patients in 2017 and 29% of the patients in 2018, and other (for example hyperemesis, chyle leakage and cancer), 36% (2017) versus 24%. On average, patients were administered short term TPN during 18.3 weeks in 2017 and 19.0 weeks in 2018. Overall, the TPN was administered by a PICC in 21 out of 22 patients in 2017 and 39 out of 41 patients in 2018. Regarding complications, in 2017 PICC's had to be replaced five times (24%) because of infection or mechanical complications, which increased in 2018 to 62%. However, most patients did not need a replacement, 86% in 2017 and 61% in 2018. Patients with fistulas had most problems with catheter because of infection.

**Conclusions:** The multidisciplinary coordination and monitoring by the Nutrition Support Team of a case-mix of patients with mostly short-term TPN at home, is increasing. Using a PICC instead of a CVC for

administering TPN might decrease complications, however more research is needed.

**Disclosure of Interest:** None declared.

#### MON-PO570

#### ACCURACY OF THE CONEX AS A NEW METHOD TO ESTIMATE NASOGASTRIC TUBE INSERTION LENGTH TO IMPROVE PATIENT SAFETY: A PROSPECTIVE OBSERVATIONAL TRIAL

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**Rationale:** Misplacement of a nasogastric (NG) tube compromises safe administration of nutrients and increases the risk of pulmonary aspiration. Despite being commonly used, the nose-earlobe-xiphoid (NEX) distance is inadequate in predicting the required NG tube length<sup>[1]</sup> and is even not evidence-based. A recently RCT<sup>[2]</sup> demonstrated that in >20% of all patients NEX distance underestimated NG insertion length. Primary aim was to test an alternative approach, the 'correction of the NEX' (CoNEX) method, in predicting correct tip positioning: (NEX\*0.38696)+30.37+6 cm. Secondary aim was to investigate the likelihood to successfully obtain gastric aspirate.

**Methods:** A 7-month prospective trial was conducted in a Belgian general hospital. NG tubes were inserted/repositioned by a CNS according to a standardized protocol. Tip positioning was verified by 2 radiologists using chest X-ray. Adult patients needing a tube were included (N = 218). Correct tip positioning was defined as >3 cm under the lower esophageal sphincter (LES).

**Results:** Predicting the required NG tube length using the CoNEX method resulted in the tip of the NG tube situated >3 cm under the LES in all patients. The depth of the tube tip in the stomach was not a determining factor for a possible upward loop of the tube inside the stomach. Within 2 hours after placement/reposition, it was possible to successfully obtain gastric aspirate in 77.9% of all tubes.

**Conclusions:** Of all known methods to determine an adequate NG tube insertion length, the CoNEX method seems to be the most accurate method for correct gastric tip positioning (>3 cm under LES). Also, the success of obtaining gastric aspirate is at least equal to that of other methods.

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**Disclosure of Interest:** None declared.

#### MON-PO571

#### FROM COMPOUND TO 'READY TO USE'- PARENTERAL NUTRITION BAGS USE IN A TERTIARY MEDICAL CENTER: AN OBSERVATIONAL STUDY

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**Rationale:** Providing compounded PN bags has been preferred for many years but a restriction in pharmacist manpower induced a re-evaluation of the distribution of parenteral nutrition (PN) bags according to requirement. In addition, these bags had a limited expiry date, and may not be applicable in case of patient's change in condition. Moreover, compounded PN bags are 50%–80% more expensive than the equivalent industrial ones. The access to more 'ready to use' industrial formulas covering most of the needs of a tertiary hospital induced a change in strategy. This study follows the use of compound vs 'ready to use' bags during the period of transition. **Methods:** All the PN bags ordered by the Medical Nutrition Therapy team were noted from 2012 to 2018 for type of PN: peripheral or central use, compound bags purchased by the pharmacy, use of different types of ready to use bags including small volume and electrolyte free bags. The pharmacy was asked to comply with special orders including addition of specific electrolytes to the electrolyte free solutions, use of partial volumes, omission of compartment such as lipids. Number of bags per year were compared using unpaired T test.

**Table**  
Personalized vs Ready-to-Use.

Year	Compounded	Ready to use EF
2012	288	0
2013	586	0
2014	14	325
2015	2	520
2016	0	279
2017	0	425
2018	0	562

**Results:** Personalized compounded bags were ordered 288 times in 2012, 586 times in 2013 and 14 times in 2014, reaching only 2 orders in 2015. Electrolyte free PN were ordered 55 in 2012, 37 in 2013, but 325 in 2014 and 520 in 2016 and 279 in 2016, 425 in 2017 and 562 times in 2018. Electrolyte modifications were performed according to patient's needs in 90% of the electrolyte free bags in the Internal Medicine wards, 79% surgical units, 75% oncology and 46% ICU. Omega 3 lipid (Omegaven) supplementation decreased from 468 to 136 times in 2013 and 0 in 2016. Glutamine decreased from 164 in 2013 to 0 in 2014. Ready to use omega 3 enriched formulas increased from 3% in 2012 to 47% in 2018 ( $p < 0.05$ ), in relation to all the PN distributed. Patient receiving PN increased from 334/year to 395/year in 2018. Mean duration of treatment remained stable ranging between 11.2 and 14.2 days during this period.

**Conclusions:** Transition between compounding and 'ready to use' PN bags is feasible within a year when using electrolyte free ready to use bags. An increase in omega-3 fatty acid enriched formulas due to new approved indications was observed together with a decrease in prescription of Omegaven.

**Disclosure of Interest:** None declared.

## Obesity and the metabolic syndrome II

### MON-PO572

#### COMPARISON OF IMPACT OF TWO BARIATRIC SURGERIES ON RISK FACTORS FOR CARDIOVASCULAR DISEASES

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**Rationale:** Obesity is an epidemic of the 21st century. Diseases associated with obesity increase both mortality rate among the patients with morbid obesity and socioeconomic costs for the whole society (treatment, annuity, long term sick leave). Obesity concerns both young and adult parts of society. Treatment based on diet and physical activity is not efficient in case of morbid obesity

**Methods:** This research was about to compare the impact of two types bariatric procedures, Sleeve Gastrectomy (SG) and Gastric Bypass (GB), on parameters that may reduce cardiovascular risk. Test results before surgery and 3, 6, 12 months after surgery were taken into account. Changes in glycosylated hemoglobin, fasting glucose and insulin, total cholesterol, LDL cholesterol and HDL cholesterol were compared. Apart from biochemical changes, changes in weight composition were analyzed, such as fat-free and fat body mass and water content in the body. The study group consisted of 39 people, including 23 people after laparoscopic SG and 16 people after laparoscopic GB.

**Results:** After 12 months, the patients lost on average 29.0% of their initial body weight after SG and 30.1% after GB. There was also a decrease in fat body mass, lean body mass and muscle mass in both groups. The differences were statistically significant in such parameters as HbA1c, fasting glucose, LDL cholesterol, HDL cholesterol and insulin after SG surgery. After GB statistically significant changes were observed in HbA1c, fasting glucose, total cholesterol and LDL cholesterol.

**Conclusions:** Bariatric surgery is an effective treatment for obesity. After 12 months of surgery, most of the metabolic parameters in both groups were improved. SG and GB treatments reduce the cardiovascular risk one year after surgery, however more research is needed to assess the long-term benefits of bariatric surgery.

**Disclosure of Interest:** None declared.

### MON-PO573

#### THE ROLE OF FTO GENOTYPE IN THE ASSOCIATION BETWEEN FTO GENE EXPRESSION AND ANTHROPOMETRIC MEASURES IN OBESE AND OVERWEIGHT ADOLESCENT BOYS.

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**Rationale:** The role of FTO genotype in the effect of FTO gene expression level on change in body mass index and body composition has not been studied. This study aimed to investigate the role of FTO genotype in the association between change in the expression level of the FTO gene with changes in anthropometric measurements in obese and overweight adolescent boys

**Methods:** Eighty-four boys aged 12–16 years participated in this longitudinal study. A bioimpedance analyzer (BIA) was used to estimate percentage of body fat (%body fat) and percentage of skeletal muscle (%skeletal muscle). The FTO gene expression level in peripheral blood mononuclear cells (PBMCs) was assessed using quantitative Real Time PCR (qPCR). The DNA samples were genotyped for the FTO gene polymorphisms by DNA sequencing. All measurements were performed at baseline and after intervention

**Results:** A significant association was observed between the level of gene expression and %skeletal muscle. The gene expression fold change was significantly associated with change in %skeletal muscle in AA or AG genotype carriers ( $\beta = 0.34$ ,  $p = .02$ ). No significant association was detected between the change in FTO gene expression with change in anthropometric indices in GG genotype carriers.

**Conclusions:** A significant association was observed between the level of gene expression and %skeletal muscle. The gene expression fold change was significantly associated with change in %skeletal muscle in



AA or AG genotype carriers ( $\beta = 0.34$ ,  $p = .02$ ). No significant association was detected between the change in FTO gene expression with change in anthropometric indices in GG genotype carriers.

**Disclosure of Interest:** None declared.

#### MON-PO574 12-WEEK KETOGENIC DIET IN OBESE

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**Rationale:** Ketogenic diet (KD) is widely promoted in public but has little attention in medical circles where a lot of scepticism is present on its behalf with fear of causing ketoacidosis and dyslipidaemia. However, in ketosis physiologic milieu differs from the one in carbohydrate-rich diet. To avoid miscommunication based on unscientific beliefs, evaluation of patients' strategies for losing weight is extremely important. Our aim was to evaluate the impact of 12-week KD (12KD) on physiological and psychological parameters of obese adults.

**Methods:** 35 sedentary obese participants (BMI:  $36.1 \pm 5.6$  kg/m<sup>2</sup>;  $37 \pm 7$  years) completed 12KD. Eating behaviour, body mass and body composition, resting metabolic rate, aerobic and anaerobic capabilities, fasting biochemical and endocrine parameters and cognitive functions were measured at baseline and at the end of weeks 1, 2, 4, 8 and 12.

**Results:** We observed decreased appetite, spontaneous lowering of energy intake, significant loss of body mass, decreased emotional and external eating, improved physical performance and increased body image satisfaction. Transiently, a significant drop in glucose and significant increases in LDL-cholesterol, CRP, and BDNF were observed in the first two weeks; then, all listed parameters returned to baseline. On the other hand, a significant reduction in insulin and leptin levels, and a significant increase in adiponectin and NPY were detected throughout the duration of 12KD. Changes in body mass, glucose, insulin, leptin and NPY significantly negatively correlated with changes in beta-hydroxybutyrate. There were no signs of ketoacidosis.

**Conclusions:** 12KD proved beneficial on body mass loss, physical performance, cognitive function, eating behaviour and metabolic profile. Due to omission of large amounts of food groups, micronutrient intake should be further evaluated.

**Disclosure of Interest:** N. Mohorko: None declared, M. Černelič-Bizjak: None declared, T. Poklar-vatovec: None declared, G. Grom: Other: LCHF coach – no access to analysis nor interpretation of results, S. Kenig: None declared, A. Petelin: None declared, Z. Jenko-Pražnikar: None declared.

#### MON-PO575 PREVALENCE AND DETERMINANTS OF DEPRESSION AND PSYCHIATRIC DISORDERS AMONG THAI OBESE PATIENTS

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**Rationale:** People living with obesity (PwO) have higher risk of chronic physical and mental illness such as depression, stress, and anxiety. Depression is reported to be associated with poor outcomes of obesity treatment. This study was carried out to investigate the prevalence and determinants of depression in Thai PwO.

**Methods:** This cross-sectional study enrolled PwO (BMI > 23 kg/m<sup>2</sup>) from an outpatient clinic at an academic medical center in Bangkok, Thailand from 2016 to 2018. Obesity treatments included bariatric surgery and non-surgical treatment. Psychiatric disorder and depression was assessed by the Thai General Health Questionnaire-12 (Thai GHQ-12 with score  $\geq 2$  indicated possible psychiatric problems), and the Patient Health Questionnaire-9 (PHQ-9 with score  $\geq 10$  indicates possible depression). All subjects underwent a standardized clinical evaluation with questionnaires and a psychiatric referral when needed.

**Results:** Among 227 patients (aged  $44 \pm 13.9$ , 64.8% female, BMI  $36.8 \pm 8.1$ ) enrolled, the prevalence of depressive symptoms was 17.2% (95% CI 0.13–0.24) as defined by PHQ-9 (higher than normal Thai population 2.7%) and 29.7% (95% CI 0.24–0.37) when defined by Thai GHQ-12 screening tools. Seventy-nine (34.6%) patients screened positive for either depression or psychiatric problems, and 27 (11.9%) screened positive with both tests. Two patients had severe depressive symptoms requiring psychiatrist referral. Thai GHQ-12 and PHQ-9 scores did not differ significantly in terms of BMI, age, sex, education, marital status, comorbidity diseases, Edmonton Obesity Staging System (EOSS) stage and bariatric surgery ( $p > 0.05$ ).

**Conclusions:** Compared with previous studies, we showed that the prevalence of depressive symptoms and mental health problems in PwO was higher than the normal Thai population. No significant predictors for depression or psychiatric disorder was identified in this population.

**Disclosure of Interest:** None declared.

#### MON-PO576 RS9930506 FTO GENE POLYMORPHISM AND OBESITY RISK: A META-ANALYSIS

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**Rationale:** Obesity is related to variations in the fat mass and an obesity associated gene (FTO); however, as the number of reports in different populations increases, there is a need to determine more precisely the effect sizes in each population group. This meta-analysis aimed to investigate the association of the rs9930506 FTO gene polymorphism and obesity.

**Methods:** We searched PubMed, MEDLINE, and Web of Science, to identify studies investigating the associations between the rs9930506 polymorphism and obesity risk. We pooled adjusted odds ratios (OR) as overall and in continent subgroup. Summary ORs were estimated using a random effects model.

**Results:** We identified 8 eligible case-control studies, investigating 3337 obesity cases and 3159 healthy controls. Considering the dominant model of inheritance, there was an association between the polymorphism and obesity (OR 1.34 [1.03–1.74]). The association remained significant in European subgroup (OR 1.68 [1.2–2.36]), but not in Asian subgroup. We also found a significant association when the model of inheritance was recessive (OR 2.47; 95% CI 1.56–3.91).

**Conclusions:** This study suggested that the carrier of rs9930506 polymorphism of FTO are at higher risk for obesity. Individual studies with large sample size are needed to further evaluate the associations between the FTO gene polymorphisms and obesity risk in various ethnic populations

**Disclosure of Interest:** None declared.

## MON-PO577

## THE BODY COMPOSITION CHANGE OF OBESE TETRAPLEGIC PATIENTS AFTER SHORT-TERM REHABILITATION

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**Rationale:** The prevalence of obesity among spinal cord injury (SCI) individuals has been reported to be very high as 40–66% across studies and it is related with increasing risks of disorders of carbohydrate metabolism and coronary artery disease. Therefore, this study aims to reveal the change of body composition in the obese tetraplegic patients following short-term rehabilitation treatment.

**Methods:** The medical charts of SCI patients who were admitted to tertiary university hospital for rehabilitation treatment from 2016 to 2017 were reviewed. Only the patients with A and B by ASIA Impairment Scale and with available records of initial and follow-up body weight and body composition analysis by bioelectrical impedance were included.

In our institution, short-term rehabilitation consists of appropriate nutritional support, physical therapy including passive or active exercise, respiratory muscle training, and neuromuscular electrical stimulation lasting 6–8 weeks.

Obesity was defined as body mass index (BMI)  $\geq 22$  kg/m<sup>2</sup> or body fat mass > 25% for male and > 35% for female.

The prevalence of obesity and body composition change in obese patients after short-term rehabilitation were analyzed.

**Results:** Total 36 tetraplegia patients were included. The average age was 44.0 years old, the majority of participants were male (97.2%) and ASIA A (68.4%). Twenty-three patients (63.9%) were classified as obese in accordance with aforementioned definition of obesity (Table 1).

After short-term rehabilitation, absolute fat mass (kg), fat percentage and fat mass index (kg/m<sup>2</sup>) were significantly reduced ( $p < 0.05$ ). On the other hand, body weight and BMI tended to decrease. Absolute skeletal muscle mass (kg) and skeletal muscle percentage tended to increase (Table 2).

**Conclusions:** The percentage of obesity was consistently high in tetraplegic patients. Through short-term rehabilitation, obesity can be managed effectively without any loss of skeletal muscle mass, even in the tetraplegic patient with ASIA A and B, who have severe disability in their motor function. These results imply that modifiable obesity in SCI patients need to be identified depending on their metabolic demand in relation to physical condition and intensity of rehabilitation therapy for proper management. Further studies with more patients with various features of SCI (level, severity and chronicity) are necessary in order to establish effective management of obesity in SCI patients.

**Disclosure of Interest:** None declared.

## MON-PO578

## THE BODY COMPOSITION CHANGE OF OBESE TETRAPLEGIC PATIENTS AFTER SHORT-TERM REHABILITATION

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\* Corresponding author.

**Rationale:** The prevalence of obesity among SCI individuals has been reported to be very high as 40–66% across studies and the obesity is

related with increasing risks of carbohydrate metabolism disorder and coronary artery disease. Therefore, this study aims to reveal the change of body composition in the obese tetraplegic patients following short-term rehabilitation treatment.

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**Results:** Total 36 tetraplegia patients were included. The average age was 44.0 years old, the majority of participants were male (97.2%) and ASIA A (68.4%). Twenty-three patients (63.9%) were classified as obese in accordance with aforementioned definition of obesity (Table 1).

After short-term rehabilitation, absolute fat mass (kg), fat percentage and fat mass index (kg/m<sup>2</sup>) were significantly reduced ( $p < 0.05$ ). On the other hand, body weight and BMI tended to decrease. Absolute skeletal muscle mass (kg) and skeletal muscle percentage tended to increase (Table 2).

**Conclusions:** The percentage of obesity was consistently high in tetraplegic patients. Through short-term rehabilitation, obesity can be managed effectively without any loss of skeletal muscle mass, even in the tetraplegic patient with ASIA A and B, who have severe disability in their motor function. These results imply that modifiable obesity in SCI patients need to be identified depending on their metabolic demand in relation to physical condition and intensity of rehabilitation therapy for proper management. Further studies with more patients with various features of SCI (level, severity and chronicity) are necessary in order to establish effective management of obesity in SCI patients.

**Disclosure of Interest:** None declared.

## MON-PO579

## ASSOCIATION OF OBESITY AND AGE-RELATED MACULAR DEGENERATION IN TURKISH POPULATION

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**Rationale:** The aim of this study was to establish the prevalence and association of age-related macular degeneration (AMD) and obesity which was not studied in Turkish population over 50 years of age.

**Methods:** A total of 200 (100 study group, 100 control group) patients with gradable fundus photography were included. All patients underwent detailed ophthalmic examination and AMD was graded with retinal photographs. Grading of AMD was done according to the International ARM Epidemiological Study Group and staged based on grading in worse eye. The association of AMD severity and obesity (based on body mass index, waist-hip ratio, waist circumference) was assessed. The main outcome variable was an association between the presence and severity of AMD with different grades of obesity.

**Results:** When individuals were evaluated according to BMI averages; BMI average of case group was found to be significantly high, compared with control group ( $p < 0.001$ ). When waist circumference averages of control group were analyzed, they were found to be significantly high between the men, compared with case group ( $p < 0.05$ ). When waist/hip circumference rate was analyzed; there was

no statistically significant difference between the groups ( $p > 0.05$ ). While the mean BMI was  $30.4 \pm 4.9$  in women and  $27.8 \pm 2.9$  in men in case group, it was found to be  $29.1 \pm 4.8$  in women and  $26.9 \pm 3.3$  in men in control group. There was statistically significant difference in terms of BMI means between control and case groups ( $p < 0.05$ ).

**Conclusions:** We found direct association between BMI and presence of AMD in Turkish population. No direct association was noted between the presence or severity of AMD and waist/hip rate. Further studies are necessary in order to conclude a causal association AMD development and abdominal obesity.

**Disclosure of Interest:** None declared.

#### MON-PO580

##### DO INTENSIVE PREOPERATIVE AND POSTOPERATIVE BEHAVIOURAL INTERVENTIONS IMPACT ON HEALTH-RELATED BARIATRIC SURGERY OUTCOMES? A SYSTEMATIC REVIEW

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**Rationale:** Although pre- and postoperative support by a multidisciplinary team (MDT) is recommended as best practice, it is unknown if intensive behavioural interventions improve outcomes beyond standard MDT support. This systematic review aimed to evaluate the effect that intensive pre- and postoperative behavioural interventions have on health-related outcomes post-surgery in adult bariatric surgery patients.

**Methods:** Six databases were searched for intervention studies in any language up until July 2018. Study quality was assessed using the Cochrane Risk of Bias tool.

**Results:** 6,871 records were screened, identifying 17 eligible publications ( $n = 10$  trials;  $n = 1,169$  participants in total) which mostly had low to unclear risk of bias. Intensive behavioural interventions addressed lifestyle ( $n = 4$  trials), physical activity ( $n = 3$  trials), or cognitive behavioural therapy ( $n = 3$  trials); which were delivered as preoperative interventions ( $n = 3$  trials), postoperative interventions ( $n = 2$  trials), or pre- and postoperative intervention ( $n = 5$  trials). Intensive interventions varied from weekly to quarterly in frequency, with a duration from 6-weeks to 24-months. No trial which concluded intervention delivery before 6-months post-surgery reported any effect compared with control ( $n = 6$  trials). All six trials which commenced or continued MDT delivery 6-months post-surgery reported significant improvements in weight and/or fat loss ( $n = 4$  trials) and depression ( $n = 1$  trial) compared with control.

**Conclusions:** For the best outcomes and most efficacious use of resources, intensive multidisciplinary behavioural interventions may be of the greatest value if they commence 6-months postoperatively; with standard multidisciplinary support provided pre- and early postoperatively.

**Disclosure of Interest:** None declared.

#### MON-PO581

##### FIBER CONSUMPTION AND TIME POST SURGERY MAY PREDICT WEIGHT REGAIN AMONG WOMEN IN THE LATE POSTOPERATIVE PERIOD OF Y-EN-ROUX GASTRIC BYPASS

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**Rationale:** Bariatric Surgery is a successful treatment against obesity. Y-en-Roux gastric bypass (YRGB) provides great weight loss, but over the years, a common weight regain has been noticed among these patients. Thereby, the aim of this study is find out what could be impacting on weight regain among women in the late postoperative of YRGB.

**Methods:** In the period of March to September 2017, the whole population ( $n = 340$ ) of two out-patient departments of the *Complexo Hospital de Clínicas* of the *Universidade Federal do Paraná* was considered following inclusion criteria. The analyses carried out were: hospital records, 24 h food record, 3-days food record, anthropometric evaluation and physical activity questionnaire. A multiple linear regression was used to predict weight regain, based on fiber intake (FI), time post surgery (TS) and Physical activity (PA) with the GraphPad Prism<sup>®</sup> software with a 95% significance level.

**Results:** 57 participants were the final sample, with a mean age of 47 years. Most of the participants were obese with a mean weight regain percentage of 19%. Participants' weight regain percentage decrease 48,62% for each gram per kilo weight of fiber intake, and increase 2,15% for each time post surgery ( $p = 0,0252$  and  $p = 0,0016$ ).

**Conclusions:** Fiber intake and time post surgery directly impact on weight regain among women in the late postoperative period of YRGB.

**Disclosure of Interest:** None declared.

#### MON-PO582

##### EFFECT OF HIGH INTENSITY PRACTICE ON THE BODY COMPOSITION TO HIGH-CARBOHYDRATE DIET IN JAPANESE SUMO WRESTLING

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**Rationale:** The obese observations suggest that the efficiency of metabolism changes in response to the level of nutrition such as to provide a long-term control of energy balance that is additional to any control of energy intake. Furthermore, there are largely advantageous to increase the body weight by eating high-carbohydrate diet in Sumo. However, there were not enough data between obese and body composition in Japanese Sumo wrestling. The purpose of this study was to investigate of the body composition with high intensity practice in Sumo students.

**Methods:** Twenty five top level male Sumo wrestling player as volunteer who belong to college Sumo association in Japan (mean  $\pm$ SD; age:  $21.04 \pm 0.98$ ; height  $174.0 \pm 0.06$  cm; weight  $116.52 \pm 24.28$  kg; BMI  $38.31 \pm 7.45$  kg/m<sup>2</sup>) participated in this study. They are well known to eat rice cooking quite much more, high-carbohydrate diet traditionally. It was performed examination of body composition. The body composition was measured using the impedance with multi frequency and reactance (Physion MD, Japan). After collecting the impedance data, it was calculated muscle mass, individual part of muscle mass and body water mass.

**Results:** It was assume were no subject normal range in BMI. Almost subject were over 35 of BMI, obese conditions. However, there were more muscle mass than body fat (Table 1).

**Table 1**

Result of Body Composition.

N = 25	Average	S.D
BMI	38.3	6.7
% Muscle Mass	37.3	4.9
% Fat Mass	28.0	6.0
% Lean Fat Mass	72.9	6.3

**Conclusions:** Consequently, high carbo loading is used by Sumo wrestling on a daily basis due to competition properties for more gain



in weight. Therefore, the judgment result of BMI is showed over obese class II according to Japanese setting data. However, all subjects were within the reference values in both groups in cholesterol (Nakajima, et al, 2018). This study would suggest that BMI was not mean obesity conditions, it was necessary measurement body composition, especially recorded muscle mass and lean fat mass.

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**Disclosure of Interest:** None declared.

#### MON-PO583

##### ANALYSIS OF RELATIONSHIP BETWEEN BLOOD EXAMINATION AND BODY COMPOSITION IN OVER 35 OF BMI

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**Rationale:** In the long term, exercise training may result in an increase of muscle mass, the largest component of fat-free mass of the body. Generically, there is a greater thermic response when Japanese Sumo wrestling students are to wish more weight for their competition ability due to regular basis of overfeeding. Furthermore, there are largely advantageous to increase the body weight by eating high-carbohydrate diet in Sumo. However, there were not enough data between obese and body composition in Sumo wrestling. The purpose of this study was to investigate relationship between the body composition with high intensity practice in Sumo and blood test.

**Methods:** 25 top level male Sumo wrestling player as volunteer participated in this study. It was performed examination of body composition. The body composition was measured using the impedance with multi frequency and reactance. After collecting the impedance data, it was calculated % of muscle mass, fat mass and lean body fat. Moreover, it was collected the blood examination. All measurement items were calculated correlation coefficient each other.

**Results:** Table 1.

**Table 1**

Correlation coefficient of typical measurement items.

	ALT (GPT) (IU/L)	$\gamma$ -GTP (IU/L)	Total Protein (g/dL)	CHOL (mg/dL)	Glycoalbumin (%)	Muscle Mass (%)	Fat Mass (%)	Lean body mass (%)
ALT (GPT) (IU/L)	0.50	0.56	0.17	0.11	-0.25	0.24	-0.35	
$\gamma$ -GTP (IU/L)	0.50	0.28	0.15	-0.07	-0.31	0.25	-0.25	
Total Protein (g/dL)	0.56	0.28	0.46	-0.03	-0.23	0.32	-0.21	
CHOL (mg/dL)	0.17	0.15	0.46	-0.24	-0.43	0.42	-0.14	
Glycoalbumin (%)	0.11	-0.07	-0.03	-0.24	0.37	-0.33	0.10	
Muscle Mass (%)	-0.25	-0.31	-0.23	-0.43	0.37	-0.80	0.43	
Fat Mass (%)	0.24	0.25	0.32	0.42	-0.33	-0.80	-0.66	
Lean body mass (%)	-0.35	-0.25	-0.21	-0.14	0.10	0.43	-0.66	

**Conclusions:** We performed anthropometric and RMR measurements on college Sumo students. The level of obesity was assessed using BMI and %Fat as reference indices. All of the Sumo wrestlers were categorized as obese using the conventional WHO criteria based on

the BMI. Due to their heavy lean body mass, Sumo wrestlers can be misclassified as obese in both body composition (Ozeki) and blood test (Nakajima).

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**Disclosure of Interest:** None declared.

#### MON-PO584

##### LONG-TERM OUTCOME OF LAPAROSCOPIC SLEEVE GASTRECTOMY FOR CHINESE SUPER OBESE PATIENTS

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**Rationale:** Laparoscopic sleeve gastrectomy (LSG) is an effective stand-alone bariatric procedure with favorable results on weight loss and comorbidity resolution. However, data concerning the long-term efficacy of LSG in the treatment of super obesity (SO, body mass index [BMI]  $\geq 50$ ) remain scarce. We aimed to evaluate the effectiveness and safety of LSG on weight loss and obesity-associated co-morbidities for Chinese SO patients.

**Methods:** Using the Bariatric Outcomes Longitudinal Database of Peking Union Medical College Hospital from August 2012 to August 2015, a total of 115 obese patients (70 females) underwent LSG by a single surgeon were enrolled. Patients were followed up after 1, 3, 6, 12, 18, and 24 months and yearly thereafter. Medium-term outcome measures were: excess weight loss (%EWL), co-morbidities improvement, and complications.

**Results:** 38 SO patients (33.0%) met the inclusion criteria, comprising 22 men (BMI  $53.5 \pm 5.7$  kg/m<sup>2</sup>) and 16 women (BMI  $52.2 \pm 5.3$  kg/m<sup>2</sup>). The common co-morbidities were liver function damage (53.3%), dyslipidemia (52.0%), Obstructive sleep apnea (45.3%), type 2 diabetes (38.7%), arterial hypertension (37.3%). The rate of co-morbidities improvement was 75.0%, 58.3%, 83.3%, 75.0% and 58.3% at 3 years after surgery, and there were no differences in co-morbidity resolution status between SO and nonsuper-obese patients. The mean yearly % EWL to postoperative year 3 was 56.4% (year 1), 60.6% (year 2), 58.1% (year 3), respectively, which all were significantly lower than in the 77 nonsuper-obese patients, 76.6% (year 1), 75.9% (year 2), 74.7% (year 3). The proportion of patients having successful weight loss was 57.9% (n = 22) postoperative year 1 according the definition of %EWL > 50%, lower than 81.7% in the nonsuper-obesity. Early severe complications (Clavien-Dindo classification > II) occurred in 2.6% of patients and no difference from the average was found. There were 2 reoperations due to weight gain and no deaths. Eleven of 38 patients experienced new-onset gastroesophageal reflux, which could be relieved by acid suppressants.

**Conclusions:** Conclusions LSG is effective in co-morbidities improvement and is safe for Chinese SO patients, while weight loss outcomes were less favorable, and further research is required.

**Disclosure of Interest:** None declared.

### MON-PO585 ASSOCIATIONS OF CARDIOVASCULAR AND ALL-CAUSE MORTALITY WITH METABOLIC SYNDROME IN HEMODIALYSIS PATIENTS

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**Rationale:** Metabolic syndrome (MetS) is a clustering of risk factors, such as abdominal obesity, insulin resistance, dyslipidemia and hypertension that together increase the risk of cardiovascular diseases. Chronic hemodialysis (HD) patients have multiple comorbidities and many metabolic disorders, causing a frequent occurrence of metabolic syndrome in this population. Besides, metabolic syndrome itself increases the risk of cardiovascular diseases. The goal of this study was to assess the prevalence of MetS in HD patients and its association with all-cause and cardiovascular disease (CVD) mortality.

**Methods:** A total of 138 HD patients were included in the prospective analysis. We analyzed demographic, anthropometric and biochemical data. Outcome measures were all-cause and CVD mortality during the three years follow-up.

**Results:** MetS was diagnosed in 57,24% of enrolled patients. During the 36 months of follow-up, 33 patients died. MetS patients showed a significantly higher mortality rate than non-MetS (30,4%vs.16,36%;  $p < 0,001$ ). The association of the different MetS components with all-cause mortality reached significance when minimally three components were present [1,81(95%CI = 1,21–2,33)], with a grouped increase in effect size for subjects with four or five MetS components. Subjects with MetS exhibited nearly twice as high risk for all-cause [HR = 1,90 (95%CI) = 1,25–2,83] and CV [HR = 1,99 (95%CI) = 1,42–2,97] mortality compared with those without MetS after adjustment for age, gender, and cardiovascular disease.

**Conclusions:** Our study demonstrated that MetS is widespread in HD patients. The focus must be on an active screening approach and treatment of cardiometabolic risk factors aiming to reduce mortality.

**Disclosure of Interest:** None declared.

## Paediatrics II

### MON-PO586 GASTRIC RESIDUAL VOLUME TO GUIDE ENTERAL FEEDING IN UK PICUS AND NEONATAL UNITS

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**Rationale:** To describe practices around gastric residual volume (GRV) monitoring to guide feeding in UK neonatal (NNU) and pediatric intensive care units (PICUs).

**Methods:** Cross-sectional e-survey of a triad of nurse, doctor and dietician in all UK pediatric intensive care units and Neonatal units between July – September 2018.

**Results:** 24/27 (89%) PICUs and 95/183 (52%) NNUs completed the survey. 96% PICUs and 85% NNUs had written guidance around enteral feeding. Guidelines were sent by 19/24 (79%) PICUs and 28/95 (29%) of NNUs.

For PICU continuous feeding was more frequent (15/24 62%) than bolus (9/24 37%) via the gastric route as their primary feeding method. All but one PICU routinely measured GRV, regardless of the method of feeding. Eighteen units had an agreed definition of feed tolerance, and all these included GRV. GRV thresholds for feed tolerance were either volume based (ml/kg body weight) (11/21 52%) or a percentage of the volume of feed administered (6/21 29%). Yet only a third of units provided guidance about the technique of GRV measurement. For NNUs almost all (94.7% 90/95) fed by bolus feed. NNUs reported variable frequency of GRV measurement from before every feed (20/90 22%) to only when clinically indicated (27/90 30%) and guidelines showed most this was most commonly (10/28 35% 4–6 hourly). Some NNUs stated they did not measure this routinely, or use GRV alone to stop feeds. When GRV was used the amount considered 'significant' varied, but was usually expressed as a percentage of the feed previously given. Decision-making around GRV was made predominantly by the bedside nurse (62%) or the nurse in charge (29%).

**Conclusions:** Both UK PICUs and NNUs commonly use GRV to guide enteral feeding, and determine feeding tolerance, this was more prevalence in PICUs. This knowledge of baseline practice will assist us in determining whether a trial of no routine GRV measurement is possible in the UK. Qualitative work will now explore parent and healthcare professional views' around this practice and acceptability and feasibility of a future trial.

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### MON-PO587 EVALUATION OF THE LEVEL OF NUTRITIONAL NEOPHOBIA IN CHILDREN AGED 6–9

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**Rationale:** Nutritional neophobia is a general aversion to eating new or unknown food. The occurrence of selective food is especially common in children, and its consequence, in addition to insufficient variation in food intake, are nutrient deficiencies.

**Methods:** The study involved 201 children, including 97 girls and 104 boys. The study population was divided into two age groups 6–7 years and 8–9 years. Children's Neophobia Scale (CFNS) questionnaire was used. The scale was modified by adjusting the form to the age of the population studied. The form of answers to the questions was the child's reaction, which was marked on the 5-point scale depicting facial expression. In CFNS, the response range was from 8 to 40 points. The higher the number of points obtained, the higher the level of nutritional neophobia. The results were developed using the Statistics version 24.

**Results:** Based on the obtained results, it was shown that the average number of points obtained by the respondents was 22,33 ± 6,02. It was observed that the highest percentage of examined children (70%) was characterized by average, while 13% low level of nutritional neophobia.

Analysis of the results on gender differences showed that boys scored more ( $23,60 \pm 6,35$ ) in neophobia than girls ( $20,98 \pm 5,36$ ). The difference was statistically significant ( $p=0,002$ ). It was checked whether the level of neophobia is different in age groups. It was found that children aged 6–7 are more often characterized by a neophobic attitude than older children, it was not a statistically significant difference.

**Conclusions:** In the study group, it was observed that the majority of children showed an average level of nutritional neophobia. A relationship between gender and neophobia was observed. The boys achieved a significantly higher level of neophobia. There were no statistically significant differences between the age groups in neophobia.

**Disclosure of Interest:** None declared.

#### MON-PO588

##### CUTOFF POINTS OF ANTHROPOMETRIC AND IMPEDANCEMETRIC PARAMETERS IN 10 TO 16 YEARS OLD GIRLS WITH METABOLIC SYNDROME

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**Rationale:** Children are at great risk of developing metabolic syndrome (MetS) due to their unhealthy lifestyle, however, cutoff points of the common anthropometric and impedance metric parameters are still not sharply defined in 10-to16 years age group.

**Methods:** A cross-sectional study, in which 170 children were recruited through frequent visits to schools in the western, central and eastern regions in Riyadh city between August and December 2017. The parents signed a written consent. Children with MetS were identified according to IDF criteria of MetS.<sup>1</sup> Body weight (Wt), height (Ht) were measured and body mass index (BMI) was calculated ( $Wt_{kg}/Ht_m^2$ ). Waist (WC), hip (HC) and mid arm (MAC) circumferences were taken, and skinfold thickness at 4 sites (biceps, triceps, subscapular and abdominal) was measured by a caliper, then they were used to calculate the percent body fat by the Slaughter equation<sup>2</sup> (PBF\_S). The mid-arm muscle area (MAMA) was also calculated according to Soler-Cataluña.<sup>3</sup> Tanita BC-418 was used to determine the percentage of body fat (PBF\_B), fat mass index (FMI), fat-free mass index (FFMI), and total body water (TBW). ROC curves were used to determine cutoff values.

**Results:** Table 1.

**Table 1**

Cutoff values of the studied parameters with their sensitivity and specificity.

Measures	Sensitivity	Specificity	Cutoff point
BMI ( $kg/m^2$ )	79%	80.4%	26.88
WC (cm)	87.5%	72.5%	81.5
HC (cm)	75%	72.5%	100.0
PBF_S (%)	62.5%	43.1%	29.94
MAMA ( $cm^2$ )	75%	60.8%	25.99
PBF_B (%)	79.2%	60.8%	34.65
FMI	83.3%	60.8%	8.84
FFMI	79.2%	72.5%	16.59
TBW	70.8%	56.9%	29.25

**Conclusions:** Anthropometric and impedance metric parameters were defined in our population of this age/gender group. The values could help in the diagnosis of MetS in this population.

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#### MON-PO589

##### FOOD HABITS, ANTHROPOMETRIC PROFILE AND PHYSICAL (IN) ACTIVITY IN PORTUGUESE CHILDREN

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**Rationale:** Unhealthy food habits and physical inactivity are obesogenic factors that contribute to pediatric obesity. This study aims to evaluate food and fluids intake, anthropometric profile and level of physical activity of Portuguese children.

**Methods:** 223 children aged from 4 to 6 years old were included. A questionnaire was applied to participants' parents using a food semi-quantitative questionnaire. Socio-demographic, clinical data and physical activity habits were assessed. Weight, height and waist circumference (WC) were measured according to international guidelines. Body mass index was calculated. This study was approved by the Ethical Committee of the University Fernando Pessoa and written informed consent was obtained from all participants. Descriptive linear regression analysis and Pearson correlation coefficients were performed using SPSS version 25. The significance level was 5%.

**Results:** Most participants (52.4%) had 5 daily meals. Milk (86%), bread (67%), cereals (52%) and yogurt (43%) were the most consumed foods. Soap was consumed once a day (33%). Water consumption was significantly below the recommended ( $P < 0.05$ ) and meat was far more consumed than fish ( $P < 0.01$ ). The majority of participants (76%) reported a daily intake of 2–3 pieces of fruit and 24% consumed only 1 piece. However, 58% of the participants ate candies 2–6 times a week, 23% never ate vegetables and only 19% consumed 2–3 pieces once a day. The favorite foods were pasta (52%) and fruit (48%); the least preferred were vegetables (43%) and fish (14%); 39% of the children being below the z-score for BMI, 29% presented a normal BMI, 19% were overweight and 14% were already obese. WC varied between 46 and 62.5 cm and; 33% practiced physical exercise once a week. Walking (42.9%) and swimming (19.0%) were the main physical activities.

**Conclusions:** Precocious interventions are crucial in preventing pediatric obesity, as well as, a varied diet and an active lifestyle.

**Disclosure of Interest:** None declared.

#### MON-PO590

##### OPERATIONAL DIAGNOSTIC ASSESSMENT OF MALNUTRITION OF THE STRONGKIDS TOOL IN HOSPITALIZED PEDIATRIC PATIENTS

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**Rationale:** The objective of this research was to validate the STRONGkids tool by diagnosing the operational performance of malnutrition in a highly complex health service provider specialized in children.

**Methods:** Descriptive cross-sectional study, in which 300 pediatric patients were selected consecutively over 5 weeks in October and November 2018. Approval by the Ethics Committee of the Faculty of Medicine of the National University of Colombia and the Research Ethics Committee of the Fundación Hospital Pediátrico la Misericordia. Inclusion criteria were: Greater than 1 month and less than or equal to 17 years 11 months, who have informed consent authorized by their parents or guardians. Exclusion criteria: patients without admission to hospitalization or surgery, who could not have anthropometry performed, who were in critical care, in resuscitation, burned patients, patients with cerebral motor insufficiency, patients with Down's Syndrome or any other pathology affecting growth.

**Results:** Malnutrition prevalence of 3.6%. The STRONGkids tool showed a high sensitivity and specificity (>80%) to identify malnutrition according to the Weight/Size (W/A) indicator in children under 5 years old and the BMI/A indicator in patients over 5 years old, when only the high risk level given by the questionnaire is considered in comparison with the nutritional classification by anthropometry. A moderate positive correlation was observed in the W/A and BMI/A indicators with a Spearman correlation coefficient of 0.46 and 0.57 for each indicator and according to the moderate Kappa coefficient for the same indicators between the anthropometric classification and the high risk classification of the questionnaire. Kappa: -0.125, EE 0.0261, CI (95%) -0.1673 -0.0651.

**Conclusions:** The STRONGkids tool presents a high sensitivity and specificity as a diagnostic criterion of malnutrition in hospitalized patients with 'high risk' classification in comparison with the anthropometric classification according to Colombian regulations.

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**Disclosure of Interest:** None declared.

## MON-PO591

### QUALITATIVE ANALYSIS OF SPECIFIC TRAINING NEEDS IN PAEDIATRIC NUTRITIONAL ASSESSMENT IN CHILDREN AT NUTRITIONAL RISK (UNDER AND OVERWEIGHT); PROCESS TO DEVELOPING A CARE PATHWAY.

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**Rationale:** Recent evidence suggests that current paediatric nutritional screening tools are unsuitable for routine use in clinical practice<sup>[1]</sup>, with none designed to identify those who are overweight or obese<sup>[2]</sup>. In order to develop effective care pathways and screening methods for the assessment of acutely unwell children to identify and manage those with nutritional deficits (including overweight), we need to better understand attitudes, behaviours, barriers and learning needs of staff whose role includes identifying nutrition risk.

**Methods:** Interviews of nurses, dietitians and doctors involved in paediatric clinical assessment were conducted in a children's hospital. Each interview was opened with the question 'You are informed that a child you are about to see has an abnormal BMI (underweight/overweight) what do you then think and do?'. Interviews were transcribed and qualitative analysis, including framework methodology and thematic analysis were used to identify attitudes, behaviours, barriers and facilitators to nutritional assessment and further management.

**Results:** Qualitative analysis revealed a common thought process for initially assessing a child's nutritional state if identified to have an abnormal body mass index, from presentation through to referral to a dietitian/nutrition team. It also demonstrated that the process and level of intervention was influenced by two key factors; a) the perceived impact of the presenting complaint on the nutritional status, including the potential negative implications on mental health, and b) the potential impact on communication and relationships built with patients and their families. There was general agreement that children who are underweight are assessed differently to those who are overweight, due to a greater concern of an underlying organic pathology for those who are underweight. Barriers identified included the severity of the acute presentation, time limits for thorough assessment and meaningful conversations with patients and families. Additional analysis identified absence of knowledge on how to manage both underweight and overweight patients including simple dietary advice for families, and a scarcity of knowledge and information for staff regarding additional resources available for children and families.

**Conclusions:** Assessment for nutritional risk, during an acute admission is influenced by multiple factors. Understanding staff members perceptions, current practices and training needs will enable the development of care pathway(s), incorporating improved knowledge, a focus on nutritional assessment and a clear nutrition management pathway.

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**Disclosure of Interest:** None declared.

## MON-PO592

### MANAGEMENT AND SCREENING OF CHILDHOOD OBESITY: PRACTICES AND EXPECTATIONS OF GENERAL PRACTITIONERS AND LIBERAL PAEDIATRICIANS

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**Rationale:** Obesity in children is a public health problem (3.5–4% in France). In relation to the difficulties encountered by healthcare professionals, the Networks for the Prevention and Management of Pediatric Obesity (RéPPOP) are major actors in this care. The French region Limousin does not have a RéPPOP. The purpose of our work was to understand and evaluate the needs and practices of General Practitioners (GPs) and Liberal Pediatricians in our region.

**Methods:** A questionnaire with socio-demographic data of physicians, their practices concerning the screening and management of pediatric obesity, as well as their difficulties and suggestions for improvement, was sent by mail to all GPs (n = 777) and Liberal Pediatricians (n = 18) of Limousin in April 2016. A reminder by mail was also realized. Statistical analysis included Student t tests, ANOVA and Chi2.

**Results:** Two hundred and thirty-eight questionnaires were included in the analysis (230 for GPs and 8 for Pediatricians). The GPs reported 23.2 ± 18.1% of children under 16 years old in their patient population. GPs reported an average of 3.5%±4.8% of obese children in their patient population, while the Pediatrics reported 4.7%±3.7%. 22% of GPs reported having realized an additional training on childhood obesity in the last 5 years. The GPs systematically calculated the body mass index in 39.3% of the cases, reported it on the curves of corpulence in 31.8% of the cases and traced the curves in 26.6% of the cases. Physicians trained in obesity performed these 3 steps significantly more frequently than untrained physicians (p = 0.005, p = 0.03, p = 0.05, respectively). Their main difficulties were family motivation (80.7%), socio-economic difficulties (51.2%) and frequent failures (45.6%). Suggestions to improve obesity care in children were the reimbursement of dietary consultations (63.0%), the creation of a RéPPOP (53.5%) and a request for training (29.1%). Physicians were unhappy with their care with a score of 3.9 ± 1.6 on 10 points for GPs and 5.1 ± 1.9 for Pediatricians. Thirty GPs (13%) were interested in a training conducted in Limousin by the RéPOPP.

**Conclusions:** Although not exhaustive, our survey focused the practices, difficulties and expectations of the GPs and Pediatricians of Limousin for childhood obesity. Following this survey, a training was conducted by the RéPOPP to the GPs of Limousin.

**Disclosure of Interest:** None declared.

#### MON-PO593

##### NUTRITION STATUS OF CHILDREN WITH CEREBRAL PALSY: USEFULNESS OF NEW US CEREBRAL PALSY GROWTH CHART

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**Rationale:** Nutritional status is a key factor affecting the quality of life in a child with Cerebral Palsy (CP). Early identification and management of malnutrition in CP children is important for long term care. To assess the nutritional status of children with CP with new CP growth chart in US compared with WHO growth chart to identify the most useful tool.

**Methods:** A cross sectional study was conducted in 104 children with cerebral palsy attending a rehabilitation clinic in a tertiary care hospital in Colombo, Sri Lanka. Interviewer administered questionnaires was administered to mother or immediate care giver to collect relevant information and 24-hour diet recall data. The level of Gross Motor Function Classification System (GMFCS) was used and the level of GMFCS was categorized into five; walks independently without limitations; walks independently with limitations; walks independently using a hand-held mobility device; self-mobility with limitations, may use powered mobility and no head control with transported in a manual wheelchair. Weight and height/length was measured and plotted in both weight-for-height for children under 5 years and BMI-for-Age for children above 5 years using WHO growth charts and US CP charts according to the level of GMFCS.

**Results:** Malnutrition by GMFCS of the study population was 1.0%, 5.8%, 8.7%, 4.8%, and 22.3% in level 1, 2, 3, 4 and 5 respectively. Overall malnutrition in the study population was 53.9% using WHO charts and 43% using CP growth charts (kappa = 0.76). 24-hour dietary recall revealed 33.7% and 63.5% of them had low protein and calorie intake respectively

**Conclusions:** High level of malnutrition was observed in CP children with applying both WHO and US growth charts and had good agreement. It is useful to detect malnutrition with the level of GMFCS for targeted interventions.

**Disclosure of Interest:** None declared.

#### MON-PO594

##### TO STUDY THE IMPACT OF COMPLIMENTARY FEEDING PRACTICES ON NUTRITIONAL STATUS AND SPEECH OF 12 TO 36 MONTH OLD CHILDREN :OBSERVATIONAL STUDY IN NORTHERN INDIA

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**Rationale:** To assess the impact of infant and young child feeding practices on nutritional status of 12 to 36 month old children. To study the speech development of 12–36 months of children and its association with infant feeding practices in well nourished children.

**Methods:** 40 children in the age group of 12–36 months who visited opd in the months of january and february 2019 were taken as study subject. Mothers of children who were willing to participate in the study were interviewed on predesigned questionnaire which had questions pertaining to age of the child, sex, caste, religion, birthweight of child, mothers age, mothers education, fathers education, nuclear or joint family, timing of start of breastfeeding, type of feeding- exclusive breast feeding, formula feeding, cows milk or mixed feeding, till what age they continued breast feeding, time of start of complimentary feeding, were they given diverse food items, time of change of texture of food from pureed to lumpy food and then family food, frequency of complimentary food per day, duration of screen time per day and is there any history of speech delay in family. Weight for age,height for age, weight for height,(on WHO charts) and speech development of the child were recorded using Language Evaluation Scale Trivandrum. Pearson Chi square test/Fischer Exact test was applied to test the variables with nominal/categorical data. P-value less than 0.05 was taken as significant at 95%confidence levels.

**Results:** Mean age of the children- 23.3 months. Breastfeeding<6 hours after birth-32.5%. Exclusive breastfeeding-62.5%. Malnourished children was significantly associated with maternal education (p 0.001), time of start of breast feeding (p 0.044) food diversity (p 0.003) and food frequency (p <0.001). Children with speech delay was significantly associated with change of texture of food (p 0.017).

**Conclusions:** Poor maternal education, delay in the time of start of breastfeeding (after 6 hours),inadequate food diversity score (<4) and inappropriate food frequency of complimentary feeding leads to

malnutrition and delay in the change of texture of food (from pureed to lumps) lead to speech delay.

**Disclosure of Interest:** None declared.

#### MON-PO595

##### DIETARY HABITS AND NUTRITIONAL STATUS IN PATIENTS WITH DUCHENNE MUSCULAR DYSTROPHY

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**Rationale:** Duchenne muscular dystrophy is a neuromuscular disease with several nutritional disturbances – from underweight to obesity.

**Methods:** 70 boys with DMD were enrolled to the study with mean age 10.13 ± 4.25 years. Weight and height were measured, BMI calculated and appropriate z scores were computed from Polish Growth Charts. Dietary habits were assessed based on Food Frequency Questionnaire and 24-hours Dietary Recall.

**Results:** In anthropometric measurements was found only significant difference in height z- score among age groups ( $p < 0.05$ ), it decreased with age ( $r = -0.442$ ;  $p < 0.001$ ). In the group aged 9–12.99 years old 50% of boys were overweight or obese. Patients on steroid therapy had significantly lower height ( $p = 0.03$ ). The most common mistakes in the diet were: excess of consumed sweets, snacks, low intake of vegetables and fruits in relation to the recommendations. The patients' diet was characterized by a high glycemic index. The observed abnormalities in dietary intake correlated with the age of patients.

**Conclusions:** It is important to assess nutritional status in patients with DMD to quickly recognize any abnormalities and to introduce appropriate management to minimize the risk of any possible complications of malnutrition.

**Disclosure of Interest:** None declared.

#### MON-PO596

##### COMPARISON OF DIFFERENT METHODS OF REVEALING BODY WEIGHT DEFICIT IN CHILDREN WITH CEREBRAL PALSY.

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**Rationale:** To estimate the frequency of body weight deficit in children with cerebral palsy (CP) according to WHO criteria and specific growth percentile charts.

**Methods:** 81 children with CP at the age 2–16 years were examined. Children were divided to 5 groups according to class of motor activity (GMFCS): I – 5 children (6.2%); II – 4 (4.9%); III – 10 (12.4%); IV – 27 (33.3%); V – 35 children (43.2%). All children conducted anthropometry. The data were evaluated using WHO criteria and specific growth percentile charts. The body composition (bioimpedance analysis, BIA) was assessed in 45 (55.6%) children.

**Results:** According to the WHO criteria in group I body weight deficit was determined in 4 (80%), in II – in 4 (100%), in III – in 7 (70%), in IV – in 23 (85%) and in V – in 34 (97%) children. Severe weight deficit was revealed in group I – in 1 (20%) child, in II – in 3 (75%) children, in III – 3 (30%) children, in IV – in 12 (44%) children, in V – in 28 (80%) children. According to specific percentile tables, body weight deficit was observed in 4 (80%); 4 (100%); 6 (60%); 17 (63%) and 27 (77.1%)

children in these groups, respectively. Severe weight deficit was identified in group I in 1 (20%) child, in II – in 2 (50%) children, III – 1 (10%) child, IV – in 8 (30%) children, V in 16 (45.7%) children. The underweight by BIA was detected in 2 (67%) children in group I, 1 (25%) children in II, 2 (50%) children in III, 8 (67%) children in IV, and in 19 (86.4%) children in V group. Severe deficit wasn't identified in I, II and III groups, in group IV it was revealed in 4 (33.3%) children, in V – in 10 (45.45%) children.

**Conclusions:** Based on the results of BIA it can be concluded that using these methods to assess the physical development of children with is comparable only in patients with mild motor disorders (I-III class GMFCS).

**Disclosure of Interest:** None declared.

## Perioperative care II

#### MON-PO597

##### THE EFFECT OF A PERIOPERATIVE MULTINUTRIENT SUPPLEMENT ON COLLAGEN SYNTHESIS DURING EARLY HERNIA REPAIR: A RANDOMISED CLINICAL PILOT STUDY

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**Rationale:** The inguinal hernia disease is associated with an imbalanced collagen metabolism including attenuated type V collagen synthesis. The aim of the present study was to normalise this distorted collagen equilibrium by supplying a combination of nutrients necessary for collagen synthesis to patients undergoing inguinal hernia repair.

**Methods:** Twenty-one male patients scheduled for Lichtenstein inguinal hernia repair were randomized to an enriched nutritional supplementation (ENS-protein) group receiving 55 mg zinc, 1250 mg vitamin C, 14 g arginine and 14 g glutamine daily ( $n = 10$ ) or to a control group ( $n = 11$ ). Both groups received 1.5 g/kg of high-quality protein daily for 28 days. In addition, experimental epidermal wounds were created from raised suction blisters. Biomarkers of type I (CICP), type III (PRO-C3) and type V (PRO-C5) collagen synthesis were measured by enzyme-linked immunosorbent assays together with zinc and free amino acids in serum collected at baseline (day -14), day 0 before surgery and on postoperative day 1 (day 1). Wound fluids from surgical drain were analysed for CICP, PRO-C3 and PRO-C5 on postoperative days 1 and 2.

**Results:** Fourteen days of ENS-protein raised the serum zinc level ( $p = 0.002$ ) but reduced ( $p = 0.022$ ) total amino acid levels preoperatively. Postoperatively, serum PRO-C5 decreased ( $p = 0.046$ ) in the protein group but not in the patients receiving ENS-protein, who also had higher ( $p = 0.041$ ) PRO-C5 levels than the protein group on day 1. CICP wound fluid levels increased from day 1 to day 2 in both groups and were higher on day 2 in the ENS-protein group compared with the protein group ( $P = 0.029$ ). PRO-C3 increased ( $p = 0.028$ ) from day 1–day 2 in the ENS-protein group, but not in the protein group. One patient in the ENS-protein group developed wound infection and subsequent hernia recurrence. In the protein group, two patients developed wound infections and hernia recurred in three other patients within the 1-year follow-up period. The epidermal wounds healed uneventfully in both groups.



**Conclusions:** Supplementation with zinc, vitamin C, arginine and glutamine maintained type V collagen synthesis systemically following inguinal hernia repair and increased type I collagen synthesis locally.

**References:** The research was funded by Medtrition Inc, Lancaster, Pennsylvania, USA

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**Disclosure of Interest:** None declared.

#### MON-PO598

##### THE APPLICABILITY OF INDIRECT CALORIMETRY, BIOELECTRICAL IMPEDANCE ANALYSIS AND SELECTED BIOCHEMICAL PARAMETERS IN THE ERAS PROTOCOL IN PATIENTS UNDERGOING LIVER TUMOR RESECTION

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**Rationale:** Analysis of changes in resting metabolic rate (RMR), body composition and biochemical indicators may improve the Enhanced Recovery After Surgery (ERAS) protocol and are relatively easy to implement in perioperative care for liver surgery. A characteristic parameter obtained due to the bioelectrical impedance is the phase angle (PA), which reduced value indicates lower cell mass and worsens the prognosis.

**Methods:** Observational study in 131 patients (68 women and 63 men) was conducted. All of them were treated by surgical resection of tumor within the liver. The majority of cases had metastatic changes (80,15%). Data was collected the day before surgery and in day 7 after surgery. T-test, Wilcoxon signed-rank test, multiple regression and Friedman's test were used to compare the 2 days.

**Results:** Average RMR before surgery was 1284.3 kcal ±183.1 in women and 1676.7 kcal ±256.2 in men. No significant change was observed at Day 7. Day 7 lab results found an increase in GGT, ALT and CRP (96.92 U/L, 73.40 U/L and 47.83 mg/L respectively) ( $p < 0.05$ ). Statistically significant differences ( $p < 0.05$ ) in body composition parameters were found, mainly in intracellular water, muscle mass, body cell mass and fat mass. Average PA value was lower by 0.74°.

**Conclusions:** Despite a decrease in muscle mass and fat mass, no significant difference was found in resting energy expenditure between pre and post-operative period. Phase angle was decreased. The monitoring of these parameters may be included in the ERAS protocol.

**Disclosure of Interest:** None declared.

#### MON-PO599

##### BENEFICIAL EFFECTS OF THE SHORT-TERM EARLY ENTERAL NUTRITION IMMEDIATELY AFTER GASTRECTOMY FOR GASTRIC CANCER: A PROPENSITY SCORE MATCHING ANALYSIS

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**Rationale:** It is well-known that nutritional status of the patients with gastric cancer who undergo gastrectomy deteriorates after surgery. Most patients will suffer from weight loss during one month after

gastrectomy, especially first one week. Therefore, we conducted a study to evaluate whether the early short-term (4 days) nutritional support with enteral feeding immediately after gastrectomy can improve the nutritional status of the patients, compared to the conventional early oral feeding.

**Methods:** The medical records of 446 patients between January 2007 and July 2018, were analyzed retrospectively. Patients were divided into two groups: the enteral nutrition (EN) group (N = 311) and the oral nutrition (ON) group (N = 135). In the EN group, a nasojejunal feeding tube (5 French) was inserted intraoperatively, and immediately after surgery elemental formulae (Elemental®: EA Pharma Co., Tokyo, Japan) were administered through the NJ tube initially at 300 kcal over first 24 hours then increased 300 kcal every 24 hours in a stepwise fashion by 1200 kcal on the final day (day 4). The EN group was also given the same conventional ON feeding given to the control (ON group), during the above period. Weight loss, nutritional index, morbidity, and length of hospital stay after surgery were compared between two groups. Propensity score matching was performed in order to adjust for any baseline differences, using the STATA module of 'PSMATCH2'. This study was approved by the Asahikawa Medical University Research Ethics Committee (No.18142).

**Results:** Hundred and six matched pairs were created with propensity score matching. The patients in the EN group maintained preoperative body weight 7 days after gastrectomy (median: 97.0%, interquartile range: 95.3 98.7 vs median: 95.6%, interquartile range: 94.2 97.0,  $P < 0.001$ ), and higher levels of transthyretin (median: 16.2 mg/dL, interquartile range: 12.4 19.2 vs median: 12.7 mg/dL, interquartile range: 10.4 16.0,  $P < 0.001$ ), compared to the ON group. No significant difference was found between two groups in the lengths of hospital stay after surgery ( $P = 0.08$ ) and the morbidity after surgery such as postoperative pneumonia ( $P = 0.28$ ) and surgical site infection ( $P = 1.0$ ).

**Conclusions:** Short-term EN immediately after gastrectomy could improve the nutritional status of the patients with gastric cancer in maintaining both body weight and the level of transthyretin in the early period after surgery.

**Disclosure of Interest:** None declared.

#### MON-PO600

##### INDIRECT CALORIMETRY IN ONCOLOGICAL SURGERY LIVER PATIENTS – COMPARISON OF RESTING ENERGY EXPENDITURE WITH PREDICTION EQUATIONS

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**Rationale:** Indirect calorimetry (IC) is the recommended tool to assess resting energy expenditure (REE) in patients. Mathematical equations based on anthropometry (body mass, height, age and sex) are usually calculated if IC is not available. These equations have been integrated in devices measuring bioelectrical impedance (BIA). The goal of this study was to evaluate the accuracy of these equations in comparison to IC in a specific population; the patients undergoing liver resection.

**Methods:** 104 patients (48 M, 56 F, age 60.8 ± 10.1 years) with metastatic changes in the liver, qualified for surgical treatment such as hemihepatectomies (n = 39), focal resections (n = 36) and segmentectomies (n = 29) were performed. The measurements were performed before elective surgery and at day 7 postoperative. The data obtained were compared with the Harris-Benedict and Mifflin formulas. T-test, Wilcoxon test and Blandt-Altman differences analysis, were used depending on the data distribution.

**Results:** REE was 1469,75 kcal in mean while mean result for Harris-Benedict equation was 1556,865 kcal and for Mifflin was 1431,74 kcal. REE determined by IC was higher on average by 399 kcal in men ( $p < 0.0001$ ). At day 7, RMR did not change significantly (M:  $-22$  kcal, F:  $+5$  kcal). After hemihepatectomies, REE decreased by 79,55 kcal and after segmentectomies and focal sections increased by 23,04 and 47,50 kcal respectively. The highest correlation level was obtained for the use of the Mifflin formula before surgery ( $R = 0.85$ , Av diff. =  $+43.77$ ; Limit of agreement (LoA):  $-271$  to  $+358$ ), and Harris-Benedict after surgery ( $R = 0.85$ , Av diff. =  $-36.36$ ; LoA:  $-344$  to  $+271$ ). Calculation derived from BIA method showed the lowest agreement with IC measurement ( $R = 0.76$ , Av diff. =  $+36.75$ , LoA:  $-417$  to  $+344$ ).

**Conclusions:** The procedure of partial resection of the liver does not have a significant impact on resting energy expenditure. If IC is not available, Mifflin equation before and Harris Benedict after surgery should be preferred. Currently, there is no ideal predictive equation for REE evaluation in liver oncological surgery.

**Disclosure of Interest:** None declared.

#### MON-PO601

##### TOTAL PARENTERAL NUTRITION EFFECTS AMONG PATIENTS WITH PANCREATIC CANCER UNDERGOING PANCREATICODUODENECTOMY

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**Rationale:** Pancreatic cancer is one of the most common malignant disorders of the digestive system, and pancreaticoduodenectomy (PD) is the standard intervention for the curative therapy of pancreatic cancer. Postoperative nutrition support including total parenteral nutrition (TPN), have been proven to be effective in improving the clinical outcomes, although there is no direct comparison available between different types of parenteral nutrition shortages. The purpose of this study was to determine the effects of intravenous lipid emulsions (IVE) on clinical outcomes in pancreatic cancer patients who underwent pancreaticoduodenectomy.

**Methods:** A randomized, controlled clinical trial was conducted by a single center in Greece, Athens. Data including patients' characteristics, laboratory results, and postoperative complications were recorded on specific forms during the perioperative period in a series of 82 patients aged 41–81 years, between November 2016 and January 2019. The post-operative feeding route was proposed by the Nutrition Support Team and patients were monitored until their discharge from the hospital. Patients receiving parenteral nutrition for at least 5 days were randomized to receive one of the following: an Olive oil/Long Chain Triglycerides (OO/LCT) or LCT/MCT/OO/fish oil containing IVE groups. Clinical evaluation and biochemical tests were performed at enrolment and after hospital discharge. Potential associations between parenteral nutrition and length of hospital stay were analyzed using generalized linear models adjusting for age, BMI, serum albumin levels, caloric intake and total bilirubin.

**Results:** Overall, out of the 82 patients, 40 (48.2%) were fed through TPN during the first 5 post-operative days: 18 via LCT/MCT/OO/fish oil and the rest ( $n = 22$ ) via olive oil/LCT IVE. The multivariable-adjusted relative risk (95% CI) for increased hospital stay ( $>12$  days) was 1.22 (1.05–1.38) in the group receiving olive oil/LCT compared to those receiving LCT/MCT/OO/fish oil. No significant differences between groups were observed regarding surgical complications involving bile leakage, pancreatic fistula, intraperitoneal bleeding, gastrointestinal bleeding or wound infection (all  $P > 0.05$ ).

**Conclusions:** LCT/MCT/OO/fish oil intravenous lipid emulsion may be more effective than olive oil/LCT in reducing hospital stay among patients with pancreatic cancer undergoing pancreaticoduodenectomy but more studies in the field are needed.

**Disclosure of Interest:** None declared.

#### MON-PO602

##### HIGH-FAT ENTERAL NUTRITION ALLEVIATES POSTOPERATIVE ILEUS IN RATS VIA INHIBITING ROS/JNK PATHWAY

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**Rationale:** Postoperative ileus (POI) is a common but major complication after surgery characterized by delayed gastrointestinal motility recovery, adversely affecting postoperative outcomes. Previous studies including ours have shown that intestinal inflammation was the major cause of POI and high-fat enteral nutrition could reduce intestinal inflammation and alleviate POI. However, the mechanism remains unknown. It is suggested that activation of ROS/JNK pathway is involved in various inflammation induced diseases. This study was therefore to investigate the role of ROS/JNK pathway in a rat model of POI, and the effect of high-fat enteral nutrition.

**Methods:** POI was induced by peritoneal air exposure for 3 hours in rats. Intestinal segments were collected at several time points to assess inflammatory mediators and ROS/JNK pathway in sham-operated rats, POI rats and POI rats fed a high-fat or control nutrition. Intestinal motility was measured 24 hours after surgery by charcoal transport assay.

**Results:** Peritoneal air exposure resulted in a significant increase of inflammatory mediators such as tumor necrosis factor (TNF)- $\alpha$ , interleukin (IL)-1 $\beta$  and myeloperoxidase activity, and reduction of intestinal motility compared to sham-operated group ( $P < 0.05$ ). Inhibition of ROS/JNK pathway through an ROS scavenger and JNK inhibitor prevented peritoneal air exposure inducing POI ( $P < 0.05$ ). Furthermore, administration of high-fat enteral nutrition significantly alleviated POI, reduced intestinal inflammatory mediators and inhibited ROS/JNK pathway compared to rats treated with control nutrition ( $P < 0.05$ ).

**Conclusions:** High-fat enteral nutrition could alleviate POI induced by peritoneal air exposure, and the underlying mechanism may be via inhibiting ROS/JNK pathway.

**Disclosure of Interest:** None declared.

#### MON-PO603

##### BODY COMPOSITION INFLUENCES MAJOR POST-OPERATIVE COMPLICATIONS, 90-DAY AND OVERALL SURVIVAL IN PANCREATIC SURGERY PATIENTS.

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**Rationale:** Pancreatic surgery still carries a high morbidity and mortality even in dedicated centers. The aim of this study was to evaluate the influence of patients' body composition on postoperative complications and survival of pancreatic surgery.

**Methods:** Retrospective study in patients undergoing pancreatic surgery between March 2012 and December 2017. Demographic,

clinical data and postoperative complications classified according to Clavien-Dindo were recorded. Body composition was assessed using routine diagnostic or staging Computed Tomography (CT). Multiple Cox proportional hazards models were adjusted.

**Results:** Ninety patients were included, 55% male, mean age of  $68 \pm 10.9$  years. Of those, 92% underwent total pancreatectomy or pancreaticoduodenectomy, 7% distal pancreatectomy and 1% multi-visceral resection; 84% had malignant disease. The incidence of major complications was 28% and 90-day mortality was 9%. Visceral Fat Area/Skeletal Muscle Area (VFA:SMA) ratio was associated with increased risk of complications (OR = 2.24, 95%CI = 1.14–4.87,  $p = 0.02$ ) and 90-day survival (HR = 2.13, 95%CI = 1.13–4.01,  $p = 0.014$ ). On simple analysis lower overall survival was observed in patients aged  $\geq 70$  years ( $p = 0.0009$ ), with postoperative complications  $\geq$ IIIb ( $p = 0.01$ ), with increase of VFA:SMA ( $p = 0.007$ ) and decrease in muscle radiation attenuation ( $p = 1.6 \times 10^{-5}$ ). In an overall survival model adjusted for age, disease malignancy, postoperative complications and body composition parameters, muscle radiation attenuation remained significantly associated with survival (HR:0.92; IC95%:0.8–0.9;  $p = 0.004$ ). A model which included only body composition variables had a discrimination ability (C-statistic 0.76) superior to a model which comprised conventional clinical variables (C-statistic 0.68).

**Conclusions:** Body composition is a major determinant of postoperative complications and survival in pancreatic surgery patients.

**Disclosure of Interest:** None declared.

#### MON-PO604

##### EARLY CLOSURE OF THE PROTECTIVE ILEOSTOMY AFTER RECTAL RESECTION DOES NOT DETERIORATE THE FUNCTION OF GASTROINTESTINAL TRACT

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**Rationale:** Early closure of the protective loop ileostomy (PLI) is a new technique used to deal with PLI which is performed to reduce anastomotic leak rate after the resection of rectum. The aim of the study was to analyze whether PLI enables early oral feeding according to ERAS protocol and does not deteriorate the GI function.

**Methods:** A randomized clinical trial was performed between October, the 1<sup>st</sup> 2016 and December, the 31<sup>st</sup>, 2017. 58 adult patients (24 F, 34 M, mean age 55.7 and 56.2) operated on for rectal carcinoma according to ERAS protocol with PLI, were randomly assigned into late (L) or early (E) closure group (14 days after discharge). Gastrointestinal function and complications' rate were analyzed.

**Results:** There were no significant differences between groups regarding neither the length of surgery ( $83.2 \pm 15.9$  vs  $87.1 \pm 21.7$  min, in E and L, respectively), intraoperative blood loss ( $15.2 \pm 7.5$  vs  $17.3 \pm 11.1$  ml, respectively), median hospital stay ( $p > 0.05$ ). The time to start oral diet with liquid product was (2.2 [1.5–3.5] hours after surgery). Intermittent nausea was observed in 2 (3.4%), vomiting resulting in withholding oral diet in 2 (3.4%). Mean time to pass flatus was 1.9 days (range 1.0–3.5), stool 2.9 (1.0–5.5) ( $p > 0.05$ )

**Conclusions:** Early closure of PLI is a safe and effective therapeutic approach, improving the recovery. It does not deteriorate the GI function. It should be implemented as a part of ERAS protocol for rectal cancer patients.

**Disclosure of Interest:** S. Klek Speakers Bureau of: Baxter, Braun, Fresenius, Nutricia, Nestle, Shire, Vipharm, M. Pisarska: None declared,

T. Cegieln<sup>3</sup>: None declared, R. Choruz: None declared, J. Salowka: None declared, P. Szybinski: None declared, M. Pedziwiatr: None declared.

#### MON-PO605

##### THE OPTIMAL PERIOPERATIVE NUTRITION SUPPORT IN GASTROINTESTINAL SURGERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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**Rationale:** Perioperative nutrition support is an integral pillar of Enhanced Recovery After Surgery (ERAS) protocols for major abdominal surgery, as it plays a pivotal role for postoperative recovery. Yet, patients undergoing surgery of the gastrointestinal (GI) tract might require tailored nutritional treatment due to the surgical remodelling of the intestinal tract. Therefore, we undertook a systematic meta-analysis of the most popular nutrition support strategies for GI tract surgery and evaluated their specific effects on length of hospital stay (LoS) and postoperative complication rates.

**Methods:** A systematic search of the MEDLINE, EMBASE and COCHRANE databases for randomized controlled trials (RCTs) was conducted to identify studies with perioperative nutritional interventions on GI tract surgery patients. Relevant data was collected in a SPSS table and analysed using the R software.

**Results:** Data was extracted from 70 RCTs containing 6128 patients. The most frequent nutritional interventions were: early oral feeding after surgery, immunonutrition, preoperative carbohydrate loading, amino acid supplementation or fatty acid supplementation. The strongest effects on LoS reduction were observed by early oral feeding (MD = -1.67; 95% CI, -2.25 to -1.09), that also reduces complication rates (RR = 0.75; 95% CI, 0.58 to 0.89). Supplementation with amino acids or immunonutrition (containing n-3 fatty acids, arginine and RNA) lead also to significantly lower LoS. Preoperative carboloading reduces the LoS (MD -7.33 days, 95% CI -14 to -1.11), but does not influence complication rates. Further subgroup analysis were conducted showing distinct effects of nutritional interventions on upper or lower GI tract patients.

**Conclusions:** The optimal perioperative nutrition support should include high quality nutrients, like essential amino acids and n-3 fatty acids. Furthermore, timing matters to achieve the maximal beneficial effects. However, as minimal requirement, patients should be fed early after surgery to avoid detrimental catabolic fasting conditions.

**Disclosure of Interest:** None declared.

#### MON-PO606

##### AN INTENSIFIED PERIOPERATIVE NUTRITION SUPPORT EFFECTIVELY REDUCES PERIOPERATIVE FASTING PERIODS AND IMPROVES NUTRIENT SUPPLY

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**Rationale:** Prolonged perioperative fasting periods (as stated in the ESPEN guidelines on 'Clinical nutrition in surgery') should be avoided to create an optimal metabolic environment for postoperative recovery. However, in clinical practice, adhering to the recommendations is often hampered, as the importance of nutrition of surgical



patients is underestimated and human resources of professional trained staff are limited.

**Methods:** We investigated the exact perioperative fasting periods and daily nutrient intakes of patients (n = 49) undergoing elective GI tract surgery under 'standard of care' conditions and when a structured professional perioperative nutritional support was provided.

**Results:** Perioperative fasting periods showed high variations, ranging from 24.0 h to 183.0 h (median: 71.0 h), with significant differences between pre- and postoperative fasting periods in patients with upper or lower GI tract malignancies, respectively. The prolonged fasting periods were accompanied by a mean cumulative energy deficit of  $9075 \pm 2168$  kcal (mean $\pm$ SD) from the day before surgery until the postoperative day 4. By a structured, individualized perioperative nutritional support, both, fasting periods (median: 42.5 h, range: 23.0–80 h) and cumulative energy deficits were reduced (mean $\pm$ SD:  $6635 \pm 3098$  kcal).

**Conclusions:** Perioperative fasting periods and nutrient supply can be improved by an intensified perioperative nutrition support delivered by a professional trained nutritionist. Apparently simple measures like pre-admission nutritional counselling, daily check-ups, nutritional support and providing the accepted meals (liquid, soft or solid diet) are highly effective in achieving the recommended 'avoidance of long periods of preoperative fasting' and to reduce energy deficits to counteract deteriorating metabolic stress states.

**Disclosure of Interest:** None declared.

#### MON-PO607 RELATIONSHIP BETWEEN NUTRITIONAL ASSESSMENT AND DETERIORATION OF ACTIVITIES OF DAILY LIVING IN PATIENTS WITH LUNG CANCER

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**Rationale:** Activities of daily living (ADL) tends to deteriorate in patients with lung cancer after surgery. Malnutrition can be a cause of ADL deterioration. To minimize the effects, nutritional screening and nutritional therapy is required. In this study, we report the relationship between preoperative nutritional screening and postoperative ADL.

**Methods:** The subjects were hospitalized patients with lung cancer who underwent lung resection from January 2013 to December 2017. The participants were divided in two groups by ADL change: ADL declining group and non-declining group. We evaluated their ADL by Functional Independence Measure Japanese edition version 3 (FIM) on admission and at discharge. Predictive factors considered were age, the Mini Nutrition Assessment-Short Form (MNA-SF), and the serum albumin level (Alb). These values were collected from our medical records, retrospectively. Multivariate analysis was done to collect significant predictive factors using logistic regression analysis. To complete these statistical analyses, we used the software package SPSS15.0 Japanese edition, considering  $P < 0.05$  as statistically significant.

**Results:** The subjects were 570 patients (365 male, 205 female). The mean age was  $68.0 \pm 9.01$ ; mean MNA-SF was  $10.9 \pm 1.60$ ; and mean Alb was  $4.12 \pm 0.405$  g/dL; while the FIM at admission was  $122 \pm 13.4$ ; and the FIM at discharge was  $122 \pm 14.3$ . In the logistic regression analysis, MNA-SF was demonstrated as significant factor to predict ADL deterioration (OR = 0.832, 95% CI: 0.728–0.951).

**Conclusions:** MNA-SF was the significant predictive factor of ADL deterioration. Nutritional status should be taken into consideration in order to provide an effective treatment plan.

**Disclosure of Interest:** None declared.

#### MON-PO608 PHAGOCYTTIC ACTIVITY OF BLOOD PLATELETS IN VARIOUS MODELS OF PREOPERATIVE ORAL IMMUNONUTRITION IN INVASIVE GASTRIC CANCER PATIENTS.

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**Rationale:** The role of platelets in host defense in patients with gastric cancer is unknown. The aim was to determine phagocytic activity of thrombocytes in invasive gastric cancer patients depends of various models of oral preoperative oral immunonutrition.

**Methods:** The study involved invasive gastric cancer patients prepared to surgery. They were fed a natural hospital diet. In addition, each patient received a three-chamber nutritional bag with a capacity of 1206 ml. Patients were randomly divided into two immunonutrition groups. Group I was received an oral glutamine (Resource Glutamine)  $2 \times 5$  g per day. Group II a solution of arginine,  $\omega - 3$  fatty acids and nucleotides (IMPACT) in the amount of 8.6 g arginine, 2.37 g of  $\omega - 3$  fatty acids, and 0.86 g of nucleotides daily. A total count of platelets, percentage of phagocytic thrombocytes and phagocytic index was measured twice – before and 12 days after surgery.

**Results:** Fifty-two patients was enrolled to the study. Twenty-four patients loss above 10% their body weight, on average 14%. The average duration was from 7 to 24 days, on average 12 days. In both group a significant improvement in platelets count and percentage of phagocytic thrombocytes was observed ( $p < 0.05$ ). Phagocytic index raised only in group with oral glutamine supplementation ( $p < 0.05$ ).

**Conclusions:** Both glutamine-based and arginine-based oral immunonutrition improved blood platelets count and percentage of phagocytic thrombocytes. Glutamine-based immunonutrition increased phagocytic index. Arginine-based immunonutrition protected against fall of phagocytic index.

**Disclosure of Interest:** None declared.

#### MON-PO609 LYMPHOCYTE SUBPOPULATIONS IN A MODEL OF PRE-OPERATIVE ORAL AND PARENTERAL GLUTAMINE-BASED IMMUNONUTRITION IN PATIENTS WITH INVASIVE GASTRIC CANCER.

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**Rationale:** Immune system in gastric cancer patients is impaired. The aim was to access the total content of lymphocytes and their subpopulations in patients with gastric cancer during preoperative glutamine-based immunonutrition depends on its route of supply.

**Methods:** The study involved patients with invasive gastric cancer prepared to surgery. They were fed a natural hospital diet. In addition, each patient received a peripheral three-chamber nutritional bag with a capacity of 1206 ml. They were randomly divided into 2 groups. Group I received an oral glutamine (Resource Glutamine)  $2 \times 5$  g daily. Group II were given an intravenous solution of glutamine (Dipeptiven) 100 ml with 0,2 g/ml medicinal product. Levels of total content of lymphocytes and their subpopulations (CD3+,CD4+,CD8+,CD19+,NK cells) was measured twice – before and after immunonutrition.

**Results:** Forty-six patients were enrolled into the study. Eighteen patients lost above 10% body weight, on average 14.8%. The average duration of immunonutrition was from 7 to 18 days–on average 13 days. Total content of lymphocytes and their subpopulations were significantly reduced in both groups in comparison with control group before immunonutrition. In patients with oral glutamine

supplementation a statistically significant decline of total content of lymphocytes was noticed ( $p < 0.05$ ). There were no more relevant changes in lymphocyte subpopulations. In Group with intravenous glutamine administration no significant changes was observed.

**Conclusions:** Immunonutrition based on intravenous glutamine prevented lymphocyte and their subpopulations from decrease but did not improve their content. 10 g oral glutamine could not protect total lymphocyte content.

**Disclosure of Interest:** None declared.

## Critical care II

### MON-PO610

#### INDICATORS OF OPTIMAL NUTRITION SUPPORT IN INTENSIVE CARE UNIT CAN BE IMPROVED BY A MULTIFACETED INTERVENTION: IMPLEMENTATION OF A DEFINED PROTOCOL AND MULTIDISCIPLINARY ROUNDS

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**Rationale:** Implication of nutrition support dieticians in daily patient rounds, staff meetings and multidisciplinary discussions can prove efficient in prompting better enteral nutrition delivery, helping in optimizing patient outcomes. The objectives of our study is to evaluate the impact of this simple intervention on the enteral nutrition delivery rates in a closed intensive care unit.

**Methods:** Clinical and nutrition data were collected for all adult critically ill patients admitted to the ICU at Saint George University Medical center Lebanon for more than 48 hours and who are eligible for EN during two periods of time: T1 and T2.

T1 is the observational period and extended from March 2016 to June 2016. T2 is the intervention period that extended from March 2017 to December 2017. During T2, protocols for nutrition support were established and multidisciplinary rounds were held, with implication of a nutrition support dietician in daily rounds, staff meetings, and case discussions.

Nutrition risk is determined using the Nutrition Risk Screening NRS<sup>4</sup>. The other measured outcomes were initiation of enteral feeding within 24 hours, reaching enteral nutrition target within 72 hours and within 7 days, and finally initiation of trophic feeding when indicated.

Potential barriers to reach EN target are listed. Descriptive statistics are performed and chi-square test was used to compare frequencies between the two time periods.

**Results:** One hundred seventeen patients were included in the study, 50 patients and 67 patients in T1 and T2 periods respectively. 76% of patients are at high risk of malnutrition using the NRS score, 84% in T1 and 70% in T2.

Fifty percent of the patients ( $n = 25$ ) started enteral feeding within 24 hours in T1 as compared to an improved rate of 63% ( $n = 42$ ) in T2 ( $\chi^2 = 1.459$ ,  $p = 0.154$ ).

Enteral nutrition target of  $\geq 70\%$  of prescribed caloric needs reached within 72 hours in hemodynamically stable patients was 28% in T1 as compared to 36% in T2 ( $\chi^2 = 7.999$ ,  $p = 0.245$ ). The difference in reaching EN target within 1 week was statistically significant between T1 (60%,  $n = 30$ ) and T2 (79%,  $n = 53$ ) ( $\chi^2 = 5.096$ ,  $p = 0.039$ ). The most common barriers in T1 were the slow progress in infusion rate (47%) and stopping feeding due to diarrhea (28%) due to absence of a well-designed protocol that was targeted in the intervention in T2. Initiation of trophic feeding when indicated in hemodynamically unstable patients improved between the two time periods increasing from 28.5% in T1 to 92% in T2. This difference was statistically significant ( $\chi^2 = 5.698$ ,  $p = 0.029$ ).

The mean LOS was 17 days, however a decreased trend of 3 days was observed between T1 (18.62 days) and T2 (15.85 days) ( $p = 0.347$ ).

Outcome	T1	T2
Number of patients	50	67
Enteral feeding started within 24 h	25 (50%)	42 (63%)
Enteral feeding target reached within 72 hours	14 (28%)	24 (35.8%)
Enteral feeding target reached within 1 week	30 (60%)	53 (79.1%)
Number of patients eligible for trophic feeding	7	12
Trophic feeding initiated	2 (28.5%)	10 (92%)

**Conclusions:** The implementation of a well-designed protocol and the presence of the ICU dietitian have successfully improved nutrition management by providing early and better delivery of enteral nutrition. This optimal nutrition support was reflected in a trend towards a reduction in length of stay.

**Disclosure of Interest:** None declared.

### MON-PO611

#### VITAMIN D STATUS AND INFLAMMATORY BIO-MARKERS IN CRITICALLY ILL PATIENTS WITH SEPSIS

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**Rationale:** To assess the status of vitamin D and the common inflammatory mediators in critically ill (ICU) patients with sepsis versus matched controls.

**Methods:** A total of 47 ICU patients (22 with sepsis and 25 controls) were included in a case-control, multicenter, prospective, observational study between January and August 2018. The study conducted in ICU units of King Saud Medical City, King Abdulaziz Medical City of the National Guard Health Affairs and King Faisal specialist hospital and research center. Patients with newly diagnosed sepsis according to Singer, et al, (2016)<sup>1</sup> consensus (within 48 hours) were defined as cases. Patients were followed for one week, 3 blood samples were taken (D0, D3, and D7) to measure 25-hydroxyvitamin D (25OHVD) and inflammatory markers (tumor necrosis factor alpha [TNF  $\alpha$ ], Granulocyte - colony-stimulating factor [G-CSF], Monocyte chemoattractant protein-1 [MCP-1], Interleukin [IL]-6, IL-8, and IL-10). the SOFA and APACHE scores were used to assess the study participants. The ethical approval was taken from the ethical committee in each hospital. The ROC curves used to test the predictors and to define the cutoff points of the best sensitivity and specificity.

**Results:** The prevalence of vitamin-D deficiency (25-OHVit D  $\leq 25$  nmol/l) was 68.2% in sepsis and 56% in controls. At D7, 25-OHVit D was significantly low in the sepsis group vs control group ( $12.62 \pm 8.49$  vs  $32.95 \pm 22.02$  nmol/l,  $P < 0.05$ ). Also, IL-10 was significantly higher in the sepsis group through the period of the study ( $P < 0.05$ ). other inflammatory parameters showed insignificant changes between both groups at any day. Moreover, insignificant changes were detected in both 25-OHVit D or IL-10 level before and after the study period ( $P > 0.05$ ). In sepsis group, SOFA score correlated

with TNF  $\alpha$  ( $r = 0.36$ ,  $P < 0.05$ ) and IL-10 ( $r = 0.37$ ,  $P < 0.05$ ). However, there were none significant negative correlations between 25-OHvit D and APACHE II or SOFA scores. Based on ROC curves, the best predictors were TNF- $\alpha$  and IL-10 (AUC; 0.756 & 0.737, respectively) (Table 1)

**Table 1**  
The cutoff values of the studied parameters.

Parameter	AUC	Cutoff value	Sensitivity	Specificity
25-OHvit D	.426	23.54 nmol/l	54.5%	47.4%
G-CSF	.440	262.24 pg/ml	54.5%	36.8%
IL-6	.670	43.92 pg/ml	72.7%	68.4%
IL-8	.665	59.15 pg/ml	63.6%	57.9%
MCP-1	.560	2117.83 pg/ml	63.6%	47.4%
TNF- $\alpha$	.756	35.98 pg/ml	72.7%	78.9%
IL-10	.737	24.30 pg/ml	63.6%	73.7%

**Conclusions:** In the population studied, patients with sepsis have low serum concentrations of 25-OHvit D and IL-10. However, IL-10 rather than other parameters could predict sepsis with a cutoff point 24.30 pg/ml. More studies are needed to confirm the use of IL-10 as a prognostic test.

#### References

1. Singer, *et al.* (2016). The third international consensus definitions for sepsis and septic shock (Sepsis-3). *Jama*, 315(8), 801–810.

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#### MON-PO612

##### A RANDOMIZED CONTROLLED TRIAL ON THE EFFECTS OF INTERMITTENT GRAVITY DRIP VERSUS BOLUS ENTERAL FEEDING ON THE INCIDENCE OF HOSPITAL-ACQUIRED PNEUMONIA AMONG INTENSIVE CARE PATIENTS

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**Rationale:** Hospital acquired pneumonia is a frequent complication of patients on enteral feeding. Bolus feeding is currently practice in our institution however its aspiration risk is not yet established. Intermittent gravity feeding is widely used however its effectiveness in preventing pneumonia is not yet proven. Trials have shown conflicting results on which feeding method has a lower risk for pneumonia.

**Methods:** We performed a randomized study to examine the effectiveness of intermittent gravity drip feeding as a strategy in reducing the incidence of pneumonia. We included patients requiring nasogastric feeding within 24 hours from admission. We randomly assigned patients using fish-bowl technique to either 1. Intermittent gravity drip feeding 2. Bolus feeding. The primary outcome was development of hospital acquired pneumonia. The secondary outcome was length of hospital stay and mortality.

**Results:** 106 were randomized into intermittent group and 104 into the bolus group. The baseline characteristics were similar at the start of the study. The primary outcome occurred in 55 of 104 patients (53%) in bolus group and 21 of 106 patients (20%) in the intermittent group (RR=0.37). Mortality occurred in 42 of 104 patients (41%) in bolus group and 26 of 106 patients (25%) in the intermittent group (RR=0.60). The average hospital stay for the bolus group was 17  $\pm$  11 days compared to intermittent group with 13  $\pm$  10 days.

**Conclusions:** 106 were randomized into intermittent group and 104 into the bolus group. The baseline characteristics were similar at the start of the study. The primary outcome occurred in 55 of 104 patients (53%) in bolus group and 21 of 106 patients (20%) in the intermittent group (RR=0.37). Mortality occurred in 42 of 104 patients (41%) in bolus group and 26 of 106 patients (25%) in the intermittent group (RR=0.60). The average hospital stay for the bolus group was 17  $\pm$  11 days compared to intermittent group with 13  $\pm$  10 days.

**Disclosure of Interest:** None declared.

#### MON-PO613

##### COMPARISON OF NUTRITIONAL RISK AND MALNUTRITION CRITERIA IN CRITICALLY ILL PATIENTS

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**Rationale:** Nutritional status is important factor associated with outcomes (complications, length of hospital stay, mortality) in intensive care unit (ICU) patients. Recently has been proposed criteria to determine the group of patients for effective medical nutrition therapy, but there is discrepancy in the selection of these criteria among ESPEN and ASPEN communities [1, 2].

**Methods:** The prospective observational study included n = 213 ICU patients admitted from September to December 2018 (trauma n = 119, neurologic n = 41, others n = 53). The disease severity, organ dysfunction, nutritional risk and diagnosis of malnutrition were evaluated during 24 hours by APACHE II, SOFA, NRS, NUTRIC and GLIM criteria, respectively. Cox regression analyses used to identify risk of mortality.

**Results:** According to NRS ( $\geq 3$  points) the adequate medical nutrition therapy may improve outcomes in 82% (n = 174) of critically ill patients and the main risk factor was severity of disease (APACHE II > 10) – 99% (n = 172). NRS (p = 0.001, HR 1.590) and NUTRIC (p = 0.000, HR 1.625) scores were risk factors of hospital mortality. However, the level of high nutritional risk ( $\geq 5$  points NRS or NUTRIC), as described by ASPEN authors, verifies in our subpopulation different groups of patients: NRS n = 21 and NUTRIC n = 54, that included only six patients with NRS  $\geq 5$  points. The GLIM's criteria of malnutrition met n = 41 patients (severe malnutrition n = 20, that included n = 15 with NRS  $\geq 5$  and n = 7 patients with NUTRIC  $\geq 5$ ).

**Conclusions:** Thus, various mathematical models, nutritional risks/status criteria and disease severity assessments identifies different groups of patient. Considering remarkable experience of Global Leadership Initiative on Malnutrition, perhaps, in the future, it will be possible to combine already existing or formulate new nutritional risk criteria in order to standardize them with malnutrition diagnostic factors.

#### References

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2. PubMed ID: 30348463.

**Disclosure of Interest:** None declared.

#### MON-PO614

##### DO OUR NEW STANDARDISED PARENTERAL NUTRITION (PN) BAGS MEET PROTEIN REQUIREMENTS BETTER ON OUR INTENSIVE CARE UNIT (ICU)?

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**Rationale:** ESPEN Critical care guidelines (2018)<sup>1</sup> recommend 1.3 g protein/kg actual body weight, aiming to meet >80% energy & protein



requirements by day 3 on critical care. Protein intake  $\geq 1.2$  g/kg have been linked with positive outcomes on ICU.<sup>2,3</sup> Following an audit in 2016, protein provision was found to be suboptimal in ICU patient on PN; a higher protein bag was introduced & a subsequent re-audit to review change of practice. The ICU is a mixed medical & surgical unit in large tertiary hospital.

**Methods:** All patients considered for PN under the ICU dietitians over a 6 month period were included. Hospital records were retrospectively analysed to compare the prescribed regime vs. estimated requirements. If patients were having a graduated build-up of PN, the target regime was used. Chi squared was used for statistical analysis.

Audit standard: 100% of patients receive 80–110% of their estimated protein requirements

**Results:** Of the 107 new PN prescription, 67% of patients had a PN regime that met between 80 and 110% of their protein requirements, 87% had a regime that met  $\geq 80\%$  of requirements (up from 25% patients in 2016). Only 43% met  $\geq 100\%$  of requirements.

26% patients were obese, these patients were significantly less likely to meet protein requirements than patients with a BMI  $< 30$  (29% vs 8%,  $p < 0.01$ ), 60% of patients on  $\geq 10$  ml/hr propofol did not meet requirements vs 8.2% of those on  $< 10$  ml/hr propofol ( $p < 0.01$ ).

**Conclusions:** Protein provision has significantly improved with the change to higher protein bags, however 23% patients received  $< 80\%$  of their protein requirements. Over a short period the impact may be small, but patients requiring extended periods on PN could acquire a significant protein deficit which may impact their survival and recovery from a critical care stay. As a result of the audit we will be exploring ways to supplement protein further.

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**Disclosure of Interest:** M. Barne Other: Baxter are paying me to give a talk at a study day in May.

#### MON-PO615

##### DETERMINANT OF DYSGLYCEMIA AND GLUCOSE VARIABILITY IN ICU LONG-STAYER PATIENTS

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**Rationale:** The intensive care (ICU) patient population has evolved towards and increasing number of very long ICU stays. Long-stayers are defined as requiring more than 1 weeks of mechanical ventilation and of ICU therapy. In an attempt to better coordinate their treatment and reduce their length of stay, the service instituted a dedicated program for patients staying more than 2 weeks. There is a lack of information about their blood glucose profile and insulin needs over time. The study aimed at investigating the factors associated with Hypoglycemia ( $< 4.1$  mmol/l) or Hyperglycemia ( $> 10$  mmol/l) during the different phases of their ICU stay.

**Methods:** Retrospective analysis of 150 consecutive patients admitted to the long-stayer program of the multidisciplinary ICU. Data extracted from the computerized system: age, weight, SAPS2 score, blood GLU and lactate, daily glucose intakes, 24 hr insulin needs to achieve glucose (Glu) targets 6–8 mmol/l. Separate analysis of the 5 first days, and 6–30 days, and of days with dysglycemia. Data as mean $\pm$ SD, median [IQR 25–75], univariate analysis.

**Results:** The patients' characteristics were: age 62 [52–71] years, SAPSII score 51[39–66]. Early HyperGlu was associated with higher severity (54.6 $\pm$ 17.4 vs. 52.1 $\pm$ 16.1  $p = 0.040$ ) and lactate (1.83[1.3–2.9] vs 1.37[1.05–1.94]mmol/L,  $p < 0.001$ ), but not with Glu intake, and resulted in higher Insulin (34[11–76] vs 16[0–38]UI/h,  $p < 0.001$ ) needs; late HyperGlu was observed in younger (62.6 $\pm$ 14.5 vs 63.8 $\pm$ 14.3;  $p = 0.013$ ), heavier patients (BMI 27.6 $\pm$ 6.2 vs 25.3 $\pm$ 4.9 kg/m<sup>2</sup>;  $p < 0.001$ ), and resulted in higher insulin (53[25–96] vs 4[0–32] UI/h  $p < 0.001$ ) needs. Early HypoGlu was observed in younger (57.9 $\pm$ 16.6 vs 63.3 $\pm$ 13.9 years  $p = 0.013$ ) and leaner patients (BMI 24 $\pm$ 6.3 vs 26.2 $\pm$ 5.5 kg/m<sup>2</sup>;  $p < 0.001$ ), and late HypoGlu, in younger patients (58.8 $\pm$ 19.2 vs 63 $\pm$ 14.2 years  $p = 0.003$ ) with low Glu intake (159.5[111.5–211.3] vs 199[156–245] g/day  $p < 0.001$ ).

**Conclusions:** While hyperGlu was observed across the ICU stay, the variables associated with Hypo- and HyperGlu differed over time. Late HypoGlu was associated with low Glu intake, which was not observed during the early period; leaner younger patients were at highest risk of HypoGlu, while modestly overweight elder patients were most exposed to HyperGlu.

**Disclosure of Interest:** None declared.

#### MON-PO616

##### THE SIGNIFICANCE OF THE CONUT SCORE FOR MEASUREMENT IN TRAUMA PATIENTS

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**Rationale:** The relationship between nutrition status of severe trauma patients and their severity and outcome have been still clearly unknown. The aim of study is to assess its relationship and how should we detect their nutrition risk using by the Injury Severity Score (ISS).

**Methods:** In this observational study, data were collected from injury patients admitted to our ICU needing seven or more days of hospitalization. We assessed nutritional condition using the Controlling Nutritional Status (CONUT) score. The patients were organized into two groups: (1) CONUT-low (CONUT-L) patients had CONUT scores of four or less points on the seventh hospital day and (2) CONUT-high (CONUT-H) patients had CONUT scores of five or more points. We tested the correlation between length of stay in the ICU (and hospitalization) and CONUT score, and we tested the correlation between ISS on admission and the CONUT score.

**Results:** A sample of 21 patients was analysed (eight CONUT-L patients and thirteen CONUT-H patients). On the seventh hospital day, transthyretin was significantly different between two groups ( $p = 0.01$ ). Length of stay in the ICU (median days: 8.0 v. 13.0,  $p = 0.016$ ) and length of hospitalization (median days: 24.0 v. 40.0,  $p = 0.039$ ) were significantly different. CONUT score on the seventh hospital day was related to the ISS on admission ( $\gamma = 0.59$ ,  $p = 0.005$ ). The ISS on admission was significantly different between the groups (median: 11.0 v. 25.0,  $p = 0.003$ ). The area under the receiver-operating-characteristics (ROC) curve when ISS was used to differentiate the CONUT-L from the CONUT-H patients was 0.87, and the ISS value of 21 had the highest combined sensitivity and specificity.

**Conclusions:** The CONUT score provided knowledge about prognosis for injury patients. The patients with scores higher than an ISS value of 21 might need a particularly careful assessment of their nutritional conditions.

**Disclosure of Interest:** None declared.

### MON-PO617 INCIDENCE OF GASTROINTESTINAL SYSTEM INTOLERANCE, HYPERNATREMIA AND HYPERGLYCEMIA IN CRITICALLY ILL PATIENTS: FIRST SEVEN DAILY MONITORING RESULTS AFTER ENTERAL NUTRITION

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**Rationale:** Gastrointestinal (GIS) intolerance, electrolyte disturbances, hyperglycemia due to EN may develop frequently in critically ill patients. We aimed to determine the incidence of GIS intolerance, hypernatremia and hyperglycemia in the acute period.

**Methods:** The study was conducted prospectively in Intensive Care Unit (ICU). Patients who are above 18 years old was received EN more than 48 hours (h) in the first 72 h of ICU admission. Symptoms of GIS intolerance were accepted as constipation, diarrhea, aspiration and high gastric residual volume (GRV). We evaluated as high gastric residual volume (GRV>150 mL), hypernatremia (Na>145 mmol/L) and hyperglycemia (Blood glucose > 140 mg/dL).

**Results:** We enrolled 122 patients. The mean age was 59 ± 19 years. The most common reasons for ICU admission were respiratory failure (34%) and neurological diseases (20%). The mean SOFA score and NUTRIC score of the patients was respectively 9 ± 3, 5 ± 2. A rate of 37.7% of the patients had diabetes mellitus and blood glucose levels were optimized by applying insulin protocol to these patients. A total of patients, 74% were received nasoduodenal nutrition and 16% of the patients received nasogastric nutrition. At baseline, mean Na value and blood glucose value was respectively 142.6 ± 6.51 mmol/L, 138.2 ± 57.67 mg/dL in patients. GIS intolerance symptoms due to EN and patients number are listed in Table 1. It was observed that hyperglycemia in 105 patients (86%) and hypernatremia in 77 patients (63%).

**Table 1**  
Frequency and number of patients with symptoms of GIS intolerance due to EN.

Symptoms of GIS intolerance	Patient (%)	Frequency (times)
Constipation	81 (66)	226
Diarrhea	56 (46)	117
High GRV	31 (25)	62

**Conclusions:** The most common symptoms of GIS intolerance were determined that constipation and diarrhea in patients who were received EN in ICU. Hyperglycemia and hypernatremia were also found to be high rate in the patients.

**Disclosure of Interest:** None declared.

### MON-PO618 FACTORS AFFECTING THE CANDIDEMIA IN PARENTERALLY FED PATIENTS

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**Rationale:** The incidence of candidemia has increased in recent years and it is an important cause of mortality and morbidity in hospitals. In order to reduce the risk of candidemia, empirical treatment should be initiated in high-risk patients group. To identify high-risk patients group usually clinical risk factors are used. Important risk factors for the candidemia have been identified and indicated in the 'Candida Score' and 'Predictive Rules'. Parenteral nutrition (PN) is one of these important factors.

The aim of this study was to evaluate the risk factors other than the risk factors indicated in the Candida Score that may affect the development of candidemia in non-neutropenic adult patients who received PN treatment.

**Methods:** Patients who were admitted to a university hospital between 1st of January and 31st of December 2018, over 18 years old, non-neutropenic, who don't received chemotherapy during PN treatment, who were applied *Candida* growth screening tests before and after PN treatment and who has negative *Candida* growth screening test result before PN treatment were included in the study. Patients with and without *Candida* growth after PN treatment were compared in terms of demographic characteristics, days of hospitalization, duration of PN treatment, leukocyte, platelet, empiric antifungal administration and other drugs. Statistical analysis was performed using SPSS V.23 program.

**Results:** Total of 75 patients included in the study. From the total of patients, 31 were female, and the mean ± standard deviation of age was 60,84 ± 17,083 and in 28 of them, *Candida* growth detected after PN treatment. The number of days in the hospital (p=0.023) and the duration of PN treatment (p=0.001) were found to be statistically related to *Candida* growth. The mean day of *Candida* growth duration was found 13,21 ± 5,84 days in patients with *Candida* growth. In the binary logistic regression analysis to determine the effect of the drugs used on the growth of candida it was found that carbapenem (Odds ratio 15.82 and 95% confidence interval 1.85–134.93, p=0.012), tigecycline (Odds ratio 38.32 and 95% confidence interval 1.38–1062.08, p=0.031) and empirical antifungals (Odds ratio 0.014 and 95% confidence interval 0.001–0.27, p=0.005) were found to be effective variables.

**Conclusions:** In conclusion, it should be kept in mind that the use of broad-spectrum antibiotics, especially carbapenem, and tigecycline, may also present a risk for the development of candidemia in patients receiving PN treatment, as well as the known risk factors such as long duration of hospital stays and empirical antifungal agent usage.

**Disclosure of Interest:** None declared.

### MON-PO619 CORRELATION OF GENDER AND BODY PARAMETERS WITH OBJECTIVE MEASURES OF MUSCLE STRENGTH AND FATIGUE

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**Rationale:** Intensive care patients can lose 20% of their muscle mass in just 10 days. It can contribute to long-term disability. In these patients, it is difficult to measure muscle strength and fatigue with current methods due to lack of cooperation. In this pilot study we are testing the dependence of objective maximum muscle strength and fatigue on sex, weight, height, calf circumference and degree of training.

**Methods:** Muscle strength of the tibialis anterior muscle was measured by increasing electric current intensity stimulation in the motor point of the muscle. Muscle fatigue was measured by 16 series of repetitive high frequency stimulations with 70% of maximum intensity used for muscle strength measurement. The air pressure was measured in the cuff located on the instep of the foot fixed in a solid plunger. Two measurements were performed on 14 healthy volunteers over a 2 weeks. Association between measured values and sex, weight, height, calf circumference and degree of training was measured by the Pearson product-moment correlation coefficient.

**Results:** Significant association was found between muscle strength and calf circumference (Pearson's correlation coefficient = 0.68,  $p = 0.02$ ). Other associations were non-significant.

**Conclusions:** The proposed method measures the force of the muscle fibers in a cylindrical volume defined by the size and distance of stimulation electrodes. Since a larger calf volume means a greater column height of the muscle fibers between the electrodes, this parameter is positively correlated with the maximum measured force. On the other hand, other parameters do not affect the strength of a defined volume of healthy muscle fibers.

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**Disclosure of Interest:** None declared.

#### MON-PO620

##### OR TO BREATHE: ENERGY AND PROTEIN INTAKE IN CRITICALLY ILL PATIENTS WITH RESPIRATORY FAILURE TREATED BY HIGH FLOW NASAL CANNULA (HFNC) OXYGENATION.

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**Rationale:** HFNC oxygenation is more frequently used in the ICU. Since this treatment can be given for many days and may impair nutritional intake, we planned to evaluate the energy and protein intake of patients receiving this therapy.

**Methods:** Patients requiring HFNC oxygenation after extubation or to prevent intubation were included consecutively in 2018. Demographics, route of nutrition (oral, enteral and/or parenteral), calories and protein prescribed and administered, complications were noted at the day of observation and until discharge. Statistical analysis used Chi square or Kruskal Wallis H test. Values are in mean and range or  $\pm$ SD.

**Results:** Forty two HFNC therapies were applied in 40 patients, 2.5 days after admission in mean. HFNC was 51.5 hours (21–103.5). Age was  $51 \pm 19$ , BMI was  $25.4 \text{ kg/m}^2$ , 60% were male, APACHE II was  $19 \pm 6$ , SOFA  $6.8 \pm 2.9$ . 62.5% were post extubation and 37.5% to defer intubation. 21 patients treated with tube feeding (TF) received 365 (247–1193) kcal/d and 18.5 (13.9–33.3) g/d protein, while those with oral feeding (OF) ( $n = 13$ ) received higher ( $p < 0.04$ ) calories: 621 (459–850) kcal/d and 22 (20–45) g/d protein. Parenteral nutrition alone (3 pts) or with TF (3 pts) did not provide more than 500 kcal/d (244–1193). When PN was administered with TF, it provided only 306 (50–504) kcal/d. Two patients did not receive any nutrition. TF patients stayed longer ( $p < 0.03$ ) (14 days, 8–20) than OF group (4 days, 2–10 range only). Patients with no nutrition stayed the shorter (5.5 days, 4–

7). Thirteen patients required intubation (8 from TF) and 2 died (1 on TF and 1 on TF and PN). LOS in the ICU was 8 (5–17) days

**Conclusions:** OF is more efficient to reach calorie and protein target when compared to TF in patients receiving HFNC oxygenation. However, both are underfeeding these patients and energy requirement remains to be determined.

**Disclosure of Interest:** None declared.

#### MON-PO621

##### VALIDITY OF PREDICTIVE EQUATIONS FOR ESTIMATION OF RESTING ENERGY EXPENDITURE AMONG MECHANICALLY VENTILATED CRITICALLY ILL PATIENTS AT DIFFERENT PHASES OF CRITICAL ILLNESS

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**Rationale:** Several predictive equations (PEs) have been developed for estimation of resting energy expenditure (REE) but no validity study has been done among mechanically ventilated critically ill patients in Southeast Asian population. This study is aimed at determining the validity of eight PEs for prediction of REE among critically ill adult Malaysian patients during acute phase ( $\leq 5$  days), late phase (6–10 days) and chronic phase ( $> 10$  days) in intensive care unit (ICU).

**Methods:** This was a prospective observational study conducted in a mixed ICU of University of Malaya Medical Centre, Malaysia from December 2016 to December 2018. REE was measured among 302 patients (acute phase), 180 patients (late phase) and 91 patients (chronic phase) by using Indirect Calorimetry (IC). Comparisons were made with eight commonly used predictive equations (with a total of 21 sub-equations): Harris Benedict (HBE) basic (1919) & variants (1999), Mifflin St Jeor (MSJ) (1990), Swinamer (1990), Penn State equations (PSU; 4 variants), American College of Chest Physicians (ACCP) (1997), Brandi (1999), Faisy (2003) and European Society for Clinical Nutrition and Metabolism (ESPEN) (2006) to estimate the energy requirement of the patients. Degree of agreement for REE estimated by eight PEs (REE-PE) was validated against REE measured by IC (REE-IC) using intraclass correlation coefficient (ICC) and the Bland-Altman test. The accuracy is defined as REE-PE values differing within  $\pm 10\%$  range compared to REE-IC.

**Results:** Mean REE-IC for all critically ill patients was  $1762 \pm 447$  kcal (acute phase),  $1884 \pm 508$  kcal (late phase) and  $1856 \pm 445$  kcal (chronic phase). In the acute phase, both Penn State equations [PSU (HBE) 2003a] and [PSU (m) 2003b] showed the highest agreement with REE-IC (ICC 0.655, 95% CI 0.585–0.715) and (ICC 0.655, 95% CI 0.557–0.731) respectively,  $p < 0.001$ . For late phase, Brandi (1999) equation showed highest agreement with REE-IC (ICC 0.701, 95%CI 0.615–0.770;  $p < 0.001$ ). During chronic phase, Faisy (2003) equation showed the highest agreement with REE-IC (ICC 0.745, 95%CI 0.614–0.831;  $p < 0.001$ ). Based on the Bland-Altman test, good agreement was also observed between these REE-PE and REE-IC which characterized by a narrow interval. Percentage of accuracy for these REE-PE were approximately 40%. The equations that consistently showed good



agreement (ICC 0.6–0.8) for all of the three phases were Brandi (1999), Faisy (2003), Swinamer (1990) and Harris Benedict (1919)  $\times 1.25$ . None of the REE-PE had excellent agreement (ICC > 0.8).

**Conclusions:** PEs tend to over or underestimate the energy requirement of critically ill patients. This occurs at different phases of critical illness. The usage of IC is important for patient care. When IC is not available, a PE that is developed from the relevant population should be used.

**Disclosure of Interest:** None declared.

#### MON-PO622 L-CITRULLINE REDUCES AMMONIUM ACETATE INDUCED HYPERAMMONEMIA IN MICE

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**Rationale:** Urea cycle disorders disrupt the conversion of toxic ammonia into urea inducing hyperammonemia that affect the central nervous system (Summar and Mew, 2018). Our goal is to evaluate the beneficial effect of the urea cycle intermediate L-citrulline (LC, Biocodex-Gentilly-France) in the ammonium acetate (AA) induced hyperammonemia model in mice.

**Methods:** For this purpose, two studies were performed in male CD1 mice according to the method of O'Connor *et al.* (1984): a lethal dose of AA (12 mmol/kg) was administered to assess the impact of LC on the neurological score and on the percentage of death, and a non-lethal dose of AA (8 mmol/kg) to evaluate its impact on the blood ammonia level. Behaviour was assessed according to Stephens and Levy (1994). Data are expressed as means  $\pm$  SEM, and statistical analysis are based on ANOVA. ED<sub>50</sub> (dose inducing an effect in 50% of animals) was determined according to Tallarida's method (2001).

**Results:** Intraperitoneal administration of 12 mmol/kg AA rapidly produces behavioural troubles and death occurs in 90–100% of mice. LC intravenous administration (2 mmol/kg) significantly reduces the neurological score and the percentage of death (8%). Oral administration of LC (4 mmol/kg) also significantly decreases the neurological score and the percentage of death (25%). Concerning protection from death, LC ED<sub>50s</sub> values are of 0.79  $\pm$  0.16 and 0.98  $\pm$  0.10 mmol/kg by intravenous or oral route, respectively. LC intravenous or oral administration significantly reduces hyperammonemia by 52 and 62% respectively.

**Conclusions:** These results show that intravenous or oral administration of L-citrulline effectively reduce both death frequency and neurological troubles induced by a lethal dose of ammonium acetate and decrease blood hyperammonemia induced by a non-lethal dose of AA in mice. L-citrulline confirms to be an efficient compound to reduce clinical manifestation of hyperammonemia in this animal model.

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**Disclosure of Interest:** P. Girard Other: Biocodex employee, M.-C. Coppé Other: Biocodex employee, P. Cloarec Other: Biocodex employee, M. Verleye Other: Biocodex employee.

#### MON-PO623 ASSESSMENT OF FEEDING INTOLERANCE DEFINITIONS IN THE PEDIATRIC INTENSIVE CARE UNIT

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**Rationale:** Intolerance, or presumed intolerance, to enteral nutrition is one of the main factors for not reaching target caloric goals in critically ill children. Feeding intolerance (FI) is inconsistently defined in current literature. Our aim was to evaluate the association between FI and clinical outcomes using different definitions of FI and to determine the most predictive definition.

**Methods:** Prospectively collected data obtained in the PEPaNIC RCT study of patients with an admission of  $\geq 4$  days and complete GI assessment were used. Clinical endpoints were new acquired infection and PICU mortality. Assessment of FI definitions were performed by adding the presence of FI in multiple regression models including baseline variables, severity of illness, centre and early PN randomization on admission day 4. The FI definitions analysed were: 1) large gastric residual volume (GRV) (defined as  $\geq 5$  ml/kg/day); 2) Percent of enteral intake compared to resting energy expenditure (REE); 3) Presence of one or multiple GI symptoms (GRV, vomiting, diarrhoea and abdominal distention); 4) Combination of GI symptoms and percentage of enteral intake to REE. The considered enteral intake thresholds were set arbitrarily based on the literature, or derived from ROC analysis.

**Results:** In total, 431 patients were included with a median age of 0.9 years [IQR 0.1–6.0], PRISM score of 9 [IQR 5–15] and PICU length of stay of 9 days [IQR 5–16]. New infection occurred in 122 (28%) patients and 22 (5%) died during PICU admission. The FI definition that was most predictive for new infection was defined as having enteral intake  $\leq 35\%$  of REE ( $p = 0.004$ ; OR 2.07 (95%CI 1.27–3.38)). No significant associations were found between PICU mortality and the different FI definitions.

**Conclusions:** On day 4 of admission, feeding intolerance defined as enteral intake  $\leq 35\%$  of REE was most associated with the primary outcome measure new infection. This definition might provide a stepping stone for future research.

**Disclosure of Interest:** None declared.

#### MON-PO624 HYPERGLYCEMIA AND MODIFIED NUTRIC SCORE IN CRITICAL PATIENTS HOSPITALIZED IN AN INTENSIVE CARE UNIT

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**Rationale:** Hyperglycemia is common in hospitalized patients, especially those who are critically ill. The NUTRIC score is a nutritional risk assessment tool for critically ill patients. The main objective of this study was to verify the association between hyperglycemia and modified NUTRIC score in critical patients hospitalized in an Intensive Care Unit at a hospital in the city of Taubaté/SP

**Methods:** A cross-sectional study with secondary data of critical patients in an Intensive Care Unit, from August 2017 to June 2018, contemplating male and female patients aged 18 years or older. The variables of interest are age, sex, clinical diagnosis, APACHE II, SOFA, number of comorbidities, length of hospital stay before admission to the ICU, and type of nutritional therapy to evaluate the NUTRIC score, which was considered high (>5 points) and low (0–4 points). Hyperglycemia was considered when blood glucose was higher than

180 mg/dL. For data evaluation, we performed descriptive statistics, chi-square of independence and relative risk analysis (odds ratio) with 95% confidence interval. The level of statistical significance considered was  $p < 0.05$ .

**Results:** A total of 30 patients were selected, of which 70% were female ( $n = 21$ ). The mean age was  $68.57 \text{ years} \pm 16.34$ , and the mean glycemia was  $192.37 \pm 64.36 \text{ mg/dL}$ . The prevalence of hyperglycemia was 67%. And prevalence of high nutritional risk was in 70% of the patients. It was verified that there is an association between hyperglycemia and NUTRIC score. There was an association between hyperglycemia and NUTRIC score ( $p < 0.001$ ). Patients with hyperglycemia presented a 100% risk for the high nutritional risk by the NUTRIC score [OR = 1.0 (0.698–1.644)]

**Conclusions:** It is concluded that there is an association between hyperglycemia and adapted NUTRIC score in critically ill patients. The majority of the patients presented hyperglycemia (67%) and high nutritional risk according to the NUTRIC score (70%).

**Disclosure of Interest:** None declared.

#### MON-PO625

##### CLINICAL AUDIT ON TUBE FEEDING PRACTICES OF INTENSIVE CARE UNITS (ICU) IN NATIONAL HOSPITAL OF SRI LANKA (NHSL).

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**Rationale:** Purpose of this audit is to improve patient care by identifying the number of patients who received prescribed continuous tube feeding in ICUs of the NHSL.

Recent ICU guideline of ESPEN (European society of clinical nutrition and metabolism) recommended continuous feeding rather than bolus enteral feeding for ICU patients and ASPEN (American society of enteral and parenteral association) guideline also recommended continuous tube feeding for patients with intolerance to bolus feeding.

**Methods:** Convenience sample of 50 patients who were prescribed continuous feeding, selected from ICUs. Measure of level of performance in ICUs are taken as, at least 80% of the expected ideal standard (100%) due to limited resources

**Results:** In this audit 33 patients from 50 had been given continuous feeding in the ICUs. Percentage of the continuous feeding is 66%.

Reasons for not having continuous feeding are non-availability of feeding pumps and bags (20%), lack of knowledge regarding operation of the feeding pumps (6%), lack of knowledge regarding importance of the continuous feeding for feeding intolerant patients (4%) and lack of care providers in the ICUs (4%).

Achievement of prescribed energy delivery is 74% in this sample. Performance of continuous feeding is well below the standard expectation (80%) and did not meet the standard. Achievement of prescribed energy delivery also did not meet expectations.

Main reasons for these results are lack of feeding pumps and feeding bags, shortage of staff, lack of knowledge regarding operation of pumps and importance of continuous feeding

**Conclusions:** Continuous feeding practices in NHSL did not meet expectations. Steps should be taken to increase feeding pumps, bags and training of ICUs care providers.

Re-audit is mandatory for evaluate the impact on feeding practices by these measures

**Disclosure of Interest:** None declared.

#### MON-PO626

##### A RANDOMIZED CONTROLLED TRIAL OF THE EFFECT OF PROTEIN RESTRICTION TO DELAY RENAL REPLACEMENT THERAPY IN SEPTIC PATIENTS WITH ACUTE RENAL FAILURE IN THAMMASAT UNIVERSITY HOSPITAL, PRELIMINARY ANALYSIS.

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**Rationale:** Currently, there is no consensus on amount of protein intake among acute kidney injury (AKI) with septic patients that not receiving renal replacement therapy (RRT). Protein from food can enhance urea production, which may cause uremia resulting in dialysis need. This research investigated the effect of limiting protein intake and its effect on delaying dialysis.

**Methods:** The study design was non-blinded randomized controlled trial in septic patients with AKI. Patients was enrolled based on inclusion criteria that were 1. acute kidney injury stage 2 according to KDIGO definition 2. sepsis patients with any source 3. received enteral feeding or parenteral nutrition 4. not have contraindication for nutritional support and exclusion criteria that were 1. refused treatment before RRT 2. improved AKI or death within 48 hours 3. initiated RRT within 48 hours. The enrolled patients were randomized into a study group with low protein, 0.9–1.0 gm/kg/day, and control group, receiving protein 1.2–1.5 gm/kg/day. Both groups received the same amount of energy at 20–25 kcal/kg/d. The collected data were baseline characteristic, time to dialysis, time to death 30 days mortality, hospital acquired infection, rate of catheter related blood stream infection and BUN/Cr each day until AKI resolved or dialysis initiation.

**Results:** A total of 32 patients underwent randomization. 7 patients were excluded by exclusion criteria. Mean age in low protein group and normal protein group were  $75.3 \pm 18.7$ ,  $75.7 \pm 18.5$  years old ( $p = 0.96$ ). Actual weight were  $58.7 \pm 14.6$ ,  $59.5 \pm 11.6$  kg ( $p = 0.88$ ). Ideal body weight were  $53.9 \pm 5.5$ ,  $51.7 \pm 4.1$  kg ( $p = 0.28$ ). baseline GFR were  $77.8 \pm 20$ ,  $68.5 \pm 18.2$  ml/min/1.73m<sup>2</sup> ( $p = 0.23$ ). The Kaplan–Meier estimates of time to indication for dialysis did not differ significantly ( $P = 0.966$ ), time to event of starting dialysis did not differ significantly ( $P = 0.995$ ) and time to death did not differ significantly ( $P = 0.659$ ) between two groups. There were no significant difference between the normal protein and low protein diet group on 30-day mortality (38.5% vs 50%,  $P = 0.561$ ), rate of hospital acquired infection (61.5% vs 75%,  $P = 0.673$ ), and catheter related blood stream infection (0% vs 16.7%,  $P = 0.22$ ).

**Conclusions:** In this preliminary report, there was no significant difference in time to dialysis between two groups. As a result, limited protein intake may not increase benefit of delay RRT in sepsis patients. However, this trial had limitation due to low number of study population.

**Disclosure of Interest:** None declared.

#### MON-PO627

##### PROBLEMS IN REACHING TARGET CALORIES IN INTENSIVE CARE UNIT: PROSPECTIVE, SINGLE CENTER, FIRST SEVEN DAYS FOLLOW-UP RESULTS AFTER ENTERAL NUTRITION

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**Rationale:** Enteral nutrition reduces morbidity and mortality in critically ill patients. It has got some problems reaching the target calories. The aim of this study was to determine these problems during enteral nutrition in acute period with critically illness.

**Methods:** This study was performed prospectively in Intensive Care Unit (ICU). The study was carried out in the first 72 hours after admission. The patients were 18 years and older who were fed enteral for 48 hours.

**Results:** In this study 122 patients were included. The mean age was  $59 \pm 19$  years. The most common of reason for ICU admission were respiratory failure (34%) and neurological diseases (20%). The mean APACHE II score was  $22 \pm 7$ . Mean NUTRIC score was  $5 \pm 2$ . Nutrition route of patients were 74% by nasoduodenal and 16% by nasogastric route. The target caloric requirement of the patients was  $1805 \pm 308$  kcal/day. Patients received calories were  $900 \pm 374$ ,  $1368 \pm 637$ ,  $1432 \pm 645$  and  $1420 \pm 603$  kcal/day on 1, 4, 6 and 7 days respectively. Enteral nutrition was interrupted 323 times during ICU. The most common causes and durations are shown in Table 1.

**Table 1**  
Reasons and duration of enteral nutrition interruption.

Causes of most interruptions (range)	Frequency (times)	Duration (h)
Radiological operations	80	3(1–43)
Problems with feeding tube	45	25(1–111)
Hemodynamic instability	31	22(2–116)
Perioperative procedures	31	6(1–30)

**Conclusions:** As a result of this study, malnutrition risk was found to be high in patients with intensive care unit followed by enteral nutrition. The calculated target calories were reached at a maximum of 79.3% on the sixth day. The biggest obstacle to achieving target calories was found as a daily radiological procedure.

**Disclosure of Interest:** None declared.

#### MON-PO628

##### FASTING IS ASSOCIATED WITH LOWER IN-HOSPITAL SURVIVAL IN ELDERLY CRITICALLY ILL PATIENTS

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**Rationale:** Elderly patients (>65 years) have an increased nutritional risk. During critical care stay fasting is prescribed due to various reasons. We hypothesized that in elderly critically patients fasting would have a deleterious effect

**Methods:** This is a retrospective cohort that evaluated fasting in the first 7 days of ICU admission. We excluded patients that stayed less than 24 hours. Patients were divided into two groups: fasting group defined as prescription of no nutritional support for at least 24 hours and the fed group defined as having a prescription of any type of nutrition support. We performed a cox regression model analysis with in-hospital mortality as the outcome variable

**Results:** The hospital mortality of the 540 included patients was 54.1% after 21 [13–38] days of follow-up (age  $74.01 \pm 6.83$  years, male 281 (52%), SAPS3  $67.1 \pm 13.89$ , BMI  $27.03 \pm 6.05$ ) The fasting group had more surgical patients (32% vs. 10.8%  $p < 0.001$ ), higher SAPS3 ( $70.31 \pm 13.44$  vs  $65.98$   $p < 0.002$ ) and mortality (68.5% vs 49.1%  $p < 0.001$ ) compared to the fed group. There was no difference between fasting and fed group regarding admission age, sex and BMI. In a multivariate cox regression analysis (HR,95%) fasting was independently associated with mortality (fasting 1.61[1.20–2.16]; SAPS3 1.02[1.01–1.03]; Surgical admission 0.74[0.49–1.12])

**Conclusions:** In elderly critically patients fasting was a predictor for in-hospital mortality

**Disclosure of Interest:** None declared.

#### MON-PO629

##### INDICATIONS FOR PERCUTANEOUS ENDOSCOPIC GASTROSTOMY IN PATIENTS WITH ACUTE CEREBRAL INFARCTION

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**Rationale:** Early enteral feeding is recommended in patients with acute cerebral infarction (ACI), who cannot take food orally. Percutaneous endoscopic gastrostomy (PEG) is recommended if enteral nutrition is needed for  $\geq 1$  month. However, many patients in our hospital are discharged with nasogastric tubes instead of undergoing PEG, as dysphagia often improves within a few weeks. We retrospectively assessed the characteristics of patients with ACI in whom dysphagia was found by videoendoscopic examination of swallowing (VE) at admission, and PEG indicated at discharge.

**Methods:** We studied 274 patients with ACI who underwent VE on hospital admission during the 3 years from April 2016 and had a Food Intake Level Scale (FILS) score of  $\leq 7$ , excluding those with mild dysphagia. Patients with an FILS score  $\leq 3$  at discharge were considered to have severe dysphagia and PEG was indicated (Group A,  $n = 71$ ), whereas those with an FILS score at discharge of  $\geq 4$  were considered to have mild dysphagia (Group B,  $n = 203$ ). Age, sex, body mass index (BMI), serum albumin level and FILS score at admission, amount of nutrition administered on the 3rd and 7th day of hospitalization, and infarction site (supra- or infratentorial) were assessed. Factors contributing to group A pathology were identified by logistic regression analysis using EZR software, by dividing the observational items into binary variables.

**Results:** The mean hospitalization length in group A was 32 days. Five patients underwent PEG. In group B, the recovery from dysphagia to an FILS score  $\geq 4$  required up to 15 days. Multivariate analysis identified FILS score  $\leq 3$  at admission ( $p < 0.0001$ ), BMI  $\leq 22$  ( $p = 0.04$ ), and serum albumin level  $\leq 3.0$  g/dL at admission ( $p < 0.001$ ) as the contributing factors to group A pathology.

**Conclusions:** PEG may be considered in patients with ACI meeting the following criteria at admission: FILS score  $\leq 3$ , BMI  $\leq 22$ , or serum albumin  $\leq 3.0$  g/dL.

**Disclosure of Interest:** None declared.

## Vitamins, antioxidants and minerals

#### MON-PO630

##### EFFECTIVENESS AND SAFETY OF SELENIUM SUPPLEMENTATION FOR TYPE 2 DIABETES MELLITUS IN ADULTS: A SYSTEMATIC REVIEW OF RANDOMISED CONTROLLED TRIALS

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**Rationale:** Although selenium (Se) is an essential micronutrient and antioxidant, its role in the management of type 2 diabetes mellitus (T2DM) remains unclear. We systematically assessed the effectiveness and safety of Se supplementation in adults with T2DM.

**Methods:** MEDLINE, EMBASE, and the Cochrane Library were searched up to April 2018 for randomised controlled trials (RCTs), evaluating the



effectiveness of Se against a comparator on DM-related outcomes. The methods were specified in advance and documented in a protocol published in PROSPERO with registration number CRD42017078657.

**Results:** Four RCTs (241 participants) were included. In individual RCTs, Se administration significantly reduced fasting insulin levels (mean difference (MD),  $-3.6 \mu\text{IU/mL}$ ; 95% CI,  $-6.36$  to  $-0.84$ ; MD,  $-5.8 \mu\text{IU/mL}$ ; 95% CI,  $-9.23$  to  $-2.37$ ), HOMA-IR (MD,  $-1$ ; 95% CI,  $-1.79$  to  $-0.21$ ; MD,  $-1.6$ ; 95% CI,  $-2.58$  to  $-0.62$ ), and HOMA-B (MD,  $-13.6$ ; 95% CI,  $-23.4$  to  $-3.8$ ; MD,  $-22.6$ ; 95% CI,  $-36.39$  to  $-8.81$ ). No effects of Se were noted on most of the other outcomes of interest. The impact on HDL was ambiguous. None of the RCTs assessed the mortality, diabetes-related complications, non-HDL, blood pressure, and health-related quality of life. The impact on HDL and fasting plasma glucose (FPG) was ambiguous. Only one adverse event (nausea) was reported as a reason for discontinuing the intervention, however, among the studies, the reporting was not accurate. Furthermore, only one RCT reported increase in FPG level in Se group (MD =  $36.38 \text{ mg/dl}$ ; 95% CI =  $15.39$  to  $57.37$ ).

**Conclusions:** Currently, there is no evidence to support the effectiveness of Se supplementation in T2DM population. Due to the increased risk of adverse effects in patients with T2DM supplemented with Se, safety should be carefully assessed in further, well-designed RCTs.

**Disclosure of Interest:** None declared.

#### MON-PO631

##### EFFECT OF VITAMIN D SUPPLEMENTATION IN PEOPLE WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE: A SYSTEMATIC REVIEW.

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**Rationale:** The epithelial lining and pulmonary immune cells can produce vitamin D, increasing the synthesis of antimicrobial peptides, regulation of the inflammatory response, remodeling of the airways and improvement of respiratory muscle function. Nevertheless, evidences indicate that people with Chronic Obstructive Pulmonary Disease (COPD) exhibit low serum vitamin D levels. The aim of this review was to systematize knowledge to investigate the potential role for vitamin D supplementation in people with COPD.

**Methods:** The review protocol was registered in the International Prospective Register of Systematic Reviews through trial registration number CRD42018105156. Web of Science, Scopus, EMBASE and Medline were searched. Studies were eligible for inclusion if they were randomized clinical trials that applied oral supplementation of cholecalciferol, evaluated serum levels by 25 (OH)D, studies published in English, Portuguese or Spanish; and excluded studies with individuals with others associated respiratory conditions.

**Results:** Of the 63.583 records identified, 10 were eligible for inclusion. The intervention period into the studies ranged from six weeks to 12 months; the interventions ranged from 800 IU to 300.000 IU. All were efficient at elevating serum levels of 25 (OH)D  $>50 \text{ nmol/L}$ . The statistical increase in predicted FEV<sub>1</sub>% ( $p=0.001$ ), decrease in the frequency of exacerbations ( $p=0.021$ ;  $p=0.042$ ;  $p=0.001$ ;  $p=0.001$ ) and improvement in functional capacity ( $p=0.001$ ) was observed.

**Conclusions:** The present review suggest a potential role for vitamin D supplementation in reducing the frequency of exacerbations, improving lung function and physical performance in people with COPD. Nevertheless, the studies exhibit many heterogeneities and conflicting results.

**Disclosure of Interest:** None declared.

#### MON-PO632

##### THE PREVALENCE, CONTRIBUTING FACTORS AND SIDE EFFECTS OF CAFFEINE CONSUMPTION AMONG LEBANESE UNIVERSITY MEDICAL AND PHARMACY STUDENTS.

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**Rationale:** Caffeine is the most widely consumed psychoactive substance. Unlike many other psychoactive substances, it is legal and unregulated in all parts of the world. More than 90% of the adult population consume it on daily basis.

**Methods:** The objective of the study was to evaluate the prevalence of caffeine consumption in Lebanese University students, as well as the socio-demographic, lifestyle and health characteristics associated with this consumption. The study also aimed to explore students' knowledge about the caffeine content of different beverages and to evaluate the side effects of excessive caffeine consumption. A cross sectional online self-administered questionnaire was sent in October and December 2018 to medicine and pharmacy students at the Saint-Joseph University, Beirut, Lebanon. The chi-square statistical test was used. Bivariate analysis was conducted with the consumption of caffeine as the dependent variable.

**Results:** The total number of respondents was 251 with a response rate of 40.3%. Mean age was 21 years with a range between 17 and 28 years. Overall students' knowledge of the caffeine content of different beverages and products was generally very good. The prevalence of caffeine consumption among participants was 95.6% with a 95% confidence interval of (93.1% – 98.2%); 75.3% noticed an increase in consumption after entry to university. No significant association was found between caffeine consumption and the consumption of tobacco, alcohol and vitamins. Reported caffeine consumption increased especially during exam periods. The beneficial effects described by the majority of consumers were improved attention, concentration and alertness. 24.6% of students stated being a highly dependent; Only 50% of students reported no withdrawal symptoms when caffeine is stopped for more than 24–48 hours. Adverse effects of caffeine consumption such as palpitations, tremors, insomnia and pollakiuria were reported by 18% to 24% of students. Our bivariate analysis showed that 21 years was the threshold age at which the average caffeine consumption increases ( $p\text{-value} = 0.01$ ) as well as the perceived risk of caffeine dependence ( $p\text{-value} = 0.005$ ).

**Conclusions:** Future physicians and pharmacist specialists play a major role of counseling in public health. Monitoring of their knowledge and their personal consumption of caffeine is of great importance.

**Disclosure of Interest:** None declared.

#### MON-PO633

##### PLASMA LEVELS OF VITAMINS AND TRACE ELEMENTS ARE LOW IN PATIENTS WITH CONTINUOUS VENO-VENOUS HEMOFILTRATION THERAPY AND IV DOUBLE VITAMIN AND TRIPLE TRACE ELEMENT SUPPLEMENTATION IS SAFE. RESULTS FROM THE MECCIAS TRIAL.

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**Rationale:** Continuous veno-venous hemofiltration (CVVH) removes non-selective molecules such as vitamins and trace-elements. Nutritional therapy needs to be adapted to those losses. Double clinical available doses of vitamins and triple trace-elements could intervene with plasma levels. The aim was to monitor plasma levels for

safety while administering high IV doses combined with parenteral nutrition for 24 hours during CVVH.

**Methods:** Ten ventilated critically ill adult patients on CVVH were treated with parenteral nutrition (1070 kcal, 56 g protein) enriched with double dose of commercially available IV vitamins and triple dose of trace elements for 24 hours. Plasma levels of 8 vitamins and 5 trace-elements were monitored by samples before administration of this 'CVVH survival solution', after 30 minutes and 24 hours. Comparison to limits of normal was done.

**Results:**

Low Plasma status	High Plasma Levels	Normal Plasma Levels
Vit C Vit D	Vit B12 Vit B6	Vit B1 Vit B9 Vit A Vit E Manganese Chrome Copper Zinc Selenium

Trace-elements remained stable at every time point. Vitamin C was undetectable low in all patients and did not improve with 375 mg/24 h supplementation. Vitamin D was below threshold in all patients but did not decrease with 600 IU D<sub>3</sub>. Most plasma levels remained stable.

**Conclusions:** Supplementation of commercially available double doses of vitamins and triple dose of trace-elements to compensate for losses and practice in line with recommendations for nutritional therapy adaptation during CVVH is insufficient to correct hypovitaminosis C and D but safe and stabilizing for most vitamins and all trace elements.

**Disclosure of Interest:** None declared.

#### MON-PO634

##### HOW RISKY OF INTRAVENOUS IRON ADMINISTRATION? (ANALYSIS OF IRON DEPOSITION BY 157 PATHOLOGICAL LIVER TISSUES)

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**Rationale:** Vitamins and minerals are routinely administered under total parenteral nutrition (TPN). The fine adjustment of the iron agent is difficult because existing blended mineral preparation is used. In the case of long-term, it is unclear if the recommended iron content is indeed appropriate.

**Methods:** The liver tissues from 187 anatomical cases for 15 years was stained with Berlin Blue, and was evaluated in five stages from 0 to V by three or more observers. Comparisons were made between the two groups with and without iron staining and among the three groups with grade 1, 2 and 3  $\leq$  with iron staining.

Also postmortem blood was punctured from the subclavian vein before autopsy and collected, centrifuged within 3 hours, stored at -80C, and then measured unsaturated serum iron, serum iron, albumin, prealbumin, hepcidin, and IL6 concentrations.

**Results:** Iron accumulation was significantly higher in the 1) male ( $p = 0.005$ ), 2) surgery history ( $p = 0.044$ ), 3) central vein administration history ( $p < 0.001$ ). In addition, the iron staining group was significantly longer than the non-iron group on the days of lifelong iron administration ( $p = 0.038$ ). In serum analysis, unsaturated serum iron was significantly higher in the group without iron staining, and ferritin and serum iron were significantly higher in the group with iron

positive staining. No statistically significant difference was observed between the two groups for another serum data.

**Conclusions:** The recommended iron dose in Japan is slightly higher than in Europe and the United States. In actual long-term TPN administration, there were only cases where no iron administration was performed. In this study, iron deposition in the liver was examined, and it was suggested that chronic intravenous iron administration may cause tissue deposition.

It is necessary to keep in mind that there is a possibility of tissue deposition if long-term administration of iron preparations extends to long-term administration even if it is the recommended daily dose.

**Disclosure of Interest:** None declared.

#### MON-PO635

##### CONTRIBUTION OF LEBANESE COMPOSITE DISHES TO ANTIOXIDANT INTAKES IN LEBANON

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**Rationale:** The Lebanese diet is comprised predominantly of a group of cooked vegetable-based composite dishes along with fresh fruits and vegetables and processed cereals chiefly in the form of bread. This diet is considered as a variant of the typical Mediterranean Diet which is actively promoted for its positive health effects. No data exist on the polyphenol fractions and antioxidant capacities (AC) of composite dishes consumed in Lebanon. In this work, Lebanese composite dishes were analyzed for their polyphenolic fractions contents and their contribution to the dietary antioxidant intake.

**Methods:** Thirty-two Lebanese composite dishes were prepared according to procedures commonly followed in the Middle East. The extractable polyphenols (EPP) were quantified by the Folin-Ciocalteu procedure on the aqueous-organic extracts, and the non-extractable proanthocyanidins (NEPA), in the residues after extraction, were measured colorimetrically. The antioxidant capacities (AC) of the dishes were assessed by the trolox equivalent antioxidant capacity (TEAC) and the ferric reducing ability of plasma (FRAP) assays.

**Results:** Results showed that the NEPA contents (15.2–2103.3 mg/100 g fresh weight) were higher than those of EPP (10.9–455.8 mg/100 g fresh weight) in most dishes. Stuffed vegetables with vegetable-based dishes contributed most to the dietary antioxidant intake at an average of 59.2%; bread contributed 13.8%, legume-based dishes 10.75%, wheat-based dishes 8.8% and rice-based dishes 7.4% of antioxidant intakes.

**Conclusions:** Although studies focus chiefly on the EPP contents of dietary commodities, our study has shown that the NEPA fraction contributes significantly to the total antioxidant intake. The generated data will have a pivotal role in assessing the antioxidant quality of Lebanese, and related Mediterranean, diets and in identifying dietary items with high AC for improving the dietary antioxidant intakes of populations.

**Disclosure of Interest:** None declared.

#### MON-PO636

##### SERUM VITAMIN B12 LEVELS IN PATIENTS WITH FAMILIAL HYPERCHOLESTEROLEMIA

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**Rationale:** There are significant gaps in the current knowledge about diet and the vitamin status in patients with familial hypercholesterolemia (FH). One of diet advices for patients with FH is to encourage consumption of plant products which are not a good source of vitamin B<sub>12</sub>. This vitamin is involved in the metabolism of homocysteine – one of the risk factors of cardiovascular diseases. The aim of the study was to evaluate if there is a deficiency of vitamin B<sub>12</sub> among FH patients.

**Methods:** The study included 44 adult patients, both men and women, with familial hypercholesterolemia, who were patients of The National Centre for FH at University Clinical Hospital, Medical University of Gdańsk. The control group consisted of 44 sex-, BMI-, and age-matched healthy volunteers. Vitamin B<sub>12</sub> levels in serum were determined using active-B<sub>12</sub> (holotranscobalamin) enzyme-immunoassay (EIA). To assess differences in dietary intake of the most common food groups between FH patients and the control group, a Food Frequency Questionnaire with 6 answers (FFQ-6) was used. Statistical analysis of the results was made with the R Statistical Software.

**Results:** There were no statistically significant differences in vitamin B<sub>12</sub> serum levels – median (Q1-Q3) in FH = 69.2 (52.3–87.7); control = 70.1 (51.8–82.1) pmol/l. However, differences in intakes of some food sources of vitamin B<sub>12</sub> – poultry, red meat, sausages, cheese, and eggs – were statistically significant ( $p < 0.05$ ) between both groups.

**Conclusions:** Accurate assessment of dietary intake of vitamins involved in homocysteine metabolism, such as vitamin B<sub>12</sub>, and detailed evaluation of vitamin status in patients with FH in order to determine all dietary factors that affect homocysteine levels can have major benefits for their health.

**Disclosure of Interest:** None declared.

#### MON-PO637

##### DIETARY INTERVENTION FOR SYSTEMIC METAL ALLERGY PATIENTS ON CLINICAL SYMPTOM AND URINARY METAL EXCRETION.

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**Rationale:** Patients with eczema with systemic metal allergy including chromium (Cr), nickel (Ni), cobalt (Co), tin (Sn), should be paid attention on symptomatic exacerbation by the excessive metal intake in food. However, difficulty in dietary intervention for metal allergy has been reported. Our purpose was to evaluate the effectiveness of dietary intervention for metal allergy by registered dietitian.

**Methods:** Thirty two patients with cutaneous symptom diagnosed as metal allergy were assigned randomly to dietary intervention by registered dietitian (DI, n = 21) or control groups (C, n = 11). Dietary intervention using Food Frequency Questionnaire Based on Food Group (FFQg) with Trace Mineral Food Composition Table was performed and evaluated one month later. Dermatologists treated skin lesions of patients of both two groups equally during the intervention. Skin symptoms with Severity Scoring of Atopic Dermatitis (SCORAD) and Visual analogue scale (VAS) of itching, routine blood tests and urinary metal excretion evaluated using ICP mass spectrometry were analyzed.

**Results:** Both groups showed excessive 10% energy intake before intervention and DI group improved to appropriate value. After dietary intervention, DI group decreased Ni and Co intake ( $p < 0.01$ ), but C

group decreased Ni intake ( $p < 0.05$ ). DI group improved SCORAD total score including particularly a range of the eczema, an oozing, excoriation, drying ( $p < 0.01$ – $0.05$ ), and erythema. In contrast, improvement of skin symptom was not observed in C group. Analysis of urinary excretion demonstrated positive correlation among blood thymus and activation-regulated chemokine (TARC) density, the blood number of eosinophils and urinary Cr excretion in Cr allergy patients, and serum CRP level and urinary Ni or Sn in Ni or Sn allergy patients respectively ( $p < 0.01$ – $0.05$ ,  $r = 0.505$ – $0.817$ ).

**Conclusions:** Dietary intervention by registered dietitian was effective to improve skin symptom via the reduction of metal intake.

**Disclosure of Interest:** None declared.

#### MON-PO638

##### SERUM 25-HYDROXYVITAMIN D LEVELS AMONG REGIONS IN MONGOLIA

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**Rationale:** Owing to a low availability and lack of dietary habit of vitamin D-rich foods including fish and mushrooms, most of Mongolian are said to have risk of vitamin D deficiency. Another factor is that solar radiation is too small to induce cutaneous synthesis of pre-vitamin D in winter because Mongolia is located in a high latitude and highland. In fact, the prevalence of rickets is very high in Mongolia. The aim of this study is to determine the spatial status of vitamin D in Mongolia.

**Methods:** This study was conducted as one of the cross-sectional surveys in National Cancer Cohort Study in Mongolia. Serum 25-hydroxyvitamin D, 25 (OH)D: the most abundant vitamin D metabolite in the circulation, was determined from 541 healthy subjects (10–64 years) living in 6 Mongolian provinces and capital, Ulaanbaatar. Blood samples were collected from September to December, 2016. Univariate analyses were conducted to describe the characteristics of participants, examine variable distributions. The mean serum 25 (OH)D concentrations were calculated for subgroup of the study population according to the sampling scheme of sex, generation, and region.

**Results:** Mean serum 25 (OH)D concentrations ( $\pm$  standard deviation) was 16.6 ( $\pm 7.0$ ) ng/mL (recommendation value,  $\geq 30.0$  ng/mL), and 70.1% of subjects was 'deficient' ( $< 20$  ng/mL) and 24.2% was 'insufficient' ( $20 \leq, < 30$  ng/mL). The levels of 25 (OH)D were significantly lower for female ( $14.9 \pm 5.9$  ng/mL) than male ( $19.5 \pm 7.8$  ng/mL,  $p < 0.001$ ) although there is no differentiation by age ( $r = -0.013$ ,  $p = 0.755$ ). Subjects of Ulaanbaatar had the lowest levels of 25 (OH)D ( $7.9 \pm 2.6$  ng/mL) of all provinces and there were significant differences even if seasonality sampling blood was considered. The levels of 25 (OH)D were relatively high in provinces on southern Mongolia.

**Conclusions:** Our results show that Mongolian had extremely low vitamin D levels, particularly in Ulaanbaatar. This is probably partly because of the impact of air pollution rather than dietary habit or solar radiation: Ulaanbaatar is the most air pollution affected area in Mongolia and annual mean of PM<sub>2.5</sub>, which reduces ultraviolet-B radiation for the synthesis of pre-vitamin D, are 6–10 times higher than the safety level. A comprehensive policy including dietary modification, supplement with vitamin D consumption, and the remedy for air pollution is required.

**Disclosure of Interest:** None declared.



**MON-PO639**  
**MANAGEMENT OF IRON SUPPLEMENTATION IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE-A PRACTICAL APPROACH**

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**Rationale:** Inflammatory bowel disease (IBD), such as Crohn's disease (CD) and ulcerative colitis (UC) are chronic, relapsing, inflammatory disorders of gastrointestinal tract with increasing global incidence and prevalence. Among broad spectrum of extra intestinal complications encountered in IBD patients, anaemia is the most common. The most prevalent type of anaemia in these patients is iron deficiency anaemia (IDA), secondary to chronic blood loss and impaired iron absorption due to tissue damage. Several studies have shown that IBD patients receiving intravenous iron incurred lower total health care cost compared to patients receiving oral iron. For several decades, medical treatments for IBD were limited to amino salicylates,

thiopurines and steroids, which do not change disease course. With increased understanding of immunopathology of IBD, novel, targeted therapies have unlocked new era of IBD treatment and allowed us to reach new therapeutic goal such as mucosal healing.

**Methods:** We hypothesized that biological therapy will reduce the need for intravenous iron supplementation in IBD patients with IDA. Study was conducted during in time January 01, to December 31, 2018 in Department of Gastroenterology, University hospital Split, Croatia and included all IBD patients currently treated in our department.

**Results:** Out of total of 321 IBD patients, 110 (34.3%) were receiving biological therapy. Out of 211 (65.7%) patients who are not receiving biological therapy, 78 (37%) were receiving intravenous iron, while only 10 out of 110 (9.1%) who are receiving biological therapy were receiving intravenous iron.

**Conclusions:** Biological therapy reduces the need for intravenous iron supplementation in patients with IBD, most likely by achieving significantly higher degree of mucosal healing and subsequent increase in iron absorption.

**Disclosure of Interest:** None declared.



## Late Breaking

## Late breaking abstracts 1

## SUN-LB640

## OMEGA-3 FATTY-ACID ENRICHED PARENTERAL NUTRITION REGIMENS IN HOSPITALIZED PATIENTS IN EU5 COUNTRIES: A PHARMACOECONOMIC ANALYSIS

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**Rationale:** The aim of this study is to perform a cost-consequence analysis of the use of omega-3 ( $\omega$ -3) fatty-acid enriched parenteral nutrition (PN) in the EU5 countries, from the hospital perspective.

**Methods:** A cost-consequence analysis was performed using a probabilistic discrete event simulation model with country-specific inputs derived from published sources. The relative  $\omega$ -3 supplementation effect estimates were from our recent meta-analysis [1]. The model estimates and compares costs and clinical impact associated with  $\omega$ -3 fatty-acid enriched PN vs. PN containing standard lipid emulsions (without omega-3 fatty acids; std-PN). Data captured were cost of PN, cost of infection, cost of hospital length of stay and total cost per patient; clinical events were infections avoided and hospital length of stay. Inputs uncertainty is evaluated via both deterministic (DSA) and probabilistic (PSA) sensitivity analyses.

**Results:** Avoided infections and shortened length of stay due to  $\omega$ -3 fatty-acid enriched PN, as compared with std-PN, in the EU5s have an expected impact on total costs per patient as shown in Table 1. Both the PSA and DSA analyses confirmed the robustness of the outputs of the model to all tested changes in the inputs.

**Table 1**  
Results

	Impact of $\omega$ -3 PN on total cost/patient compared to std-PN (Mean $\pm$ SD)
UK	-2,528 $\pm$ 942 £ (-2,853 $\pm$ 1,063 €)
Germany	-2,228 $\pm$ 1,389 €
Italy	-1,766 $\pm$ 1,275 €
France	-2,244 $\pm$ 848 €
Spain	-1,782 $\pm$ 1,307 €

**Conclusion:**  $\omega$ -3 fatty-acid enriched PN is likely a dominant alternative to std-PN from the point of view of a hospital in any of the EU5 countries as it is associated with significantly improved patient outcomes and cost savings.

## Reference

Pradelli L *et al.* Omega-3 fatty-acid enriched parenteral nutrition in hospitalized patients: systematic review with meta-analysis and trial sequential analysis. JPEN 2019 (Accepted).

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## SUN-LB641

## SURVEY OF SARCOPENIA IN OUTPATIENTS WITH TYPE 2 DIABETES

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**Rationale:** Prevalence of sarcopenia is considered high among patients with type 2 diabetes, but there are few reports. We investigated the prevalence of sarcopenia in outpatients with type 2 diabetes.

**Methods:** Subjects comprised 551 outpatients with type 2 diabetes (males 355, aged range 20 to 88, mean 63.7 yrs old, mean BMI 26.1 kg/m<sup>2</sup>, mean HbA1c 7.4%), baseline measurements were taken for muscle mass using the bioelectrical impedance analysis method (InBody720), grip strength and gait speed. Sarcopenia was determined using Asian Working Group for Sarcopeniadiagnostic criteria. The relationship between diabetes index and diabetes drugs was examined.

**Results:** Seventy-one cases (mean, age 74.7 yrs old BMI 21.6 kg/m<sup>2</sup>) (prevalence 12.9%) were judged as sarcopenia, and of 298 cases aged over 65 yrs old 67 were judged as having sarcopenia. Sarcopenia and obesity complications were found in 2.0% of patients aged 20 to 88, and 3.35% aged  $\geq$ 65 yrs old, sarcopenia and obesity complications were more frequently observed in the elderly. HbA1c did not significantly differ by presence or absence of sarcopenia. Associations with diabetic drugs were: biguanide 47.8%, insulin 20.6% in the sarcopenia-free group, and 26.8% biguanide in the sarcopenia group, Insulin 38.0% in the group with obesity, 45.5% biguanide in the group with obesity, Insulin 54.5% and insulin usage rate association with biguanide ( $P = 0.004$ ) and insulin ( $p = 0.02$ ) was high, sarcopenia-free and judged groups.

**Conclusion:** The prevalence of sarcopenia in outpatients with type 2 diabetes was 12.9%, and 22.5% among patients aged  $\geq$ 65 yrs old. It is considered that risk of sarcopenia is increased in patients  $\geq$ 65 yrs old, including lean patients, high BMI, and insulin users.

## Reference

Chen LK, *et al.* Sarcopenia in Asia: consensus report of the Asian Working Group for Sarcopenia, *J Am Med Dir Assoc* 2014;15:95–101.

**Disclosure of Interest:** None declared.

## SUN-LB642

## BENEFICIAL EFFECT OF OLIVE OIL BASED PARENTERAL NUTRITION COMPARED TO FISH OIL IN CRITICALLY ILL PATIENTS

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**Rationale:** Parenteral nutrition (PN) is essential for critically ill patients to ensure a proper caloric and protidic support when enteral route is contraindicated or insufficient. Lipid emulsion constitute almost half of the non-protein caloric intake in PN and may have an intrinsic effect on systemic inflammatory response. Previous data has shown the probable superiority of fish oil (FO) and olive oil (OO) based lipid emulsion on patient outcome, compared to soy-bean, in the ICU setting [1], however a controversy persists. Our objective was to compare FO and OO in critically ill patients receiving parenteral nutrition.

**Methods:** Data was extracted from the FRANS database, an international prospective observational study assessing nutritional prescription in the ICU conducted in 26 ICUs in France and Belgium between February and August 2015 on 1210 patients. For the present sub-study, patient receiving exclusive or supplemental OO or FO based PN at a minimal amount of 10 kcal/kg per day of prescription were selected. Were excluded patients receiving multiple type of PN. Multivariate logistic regression with propensity score analysis was carried out.

**Results:** Three hundred forty-six patients met inclusion criteria (234 FO and 112 OO group). Median age was 64 [51, 75], BMI was 25 [22, 29], admission SOFA score was 8 [5, 11] and 87% were mechanically ventilated. Patients received a median intake of 20.84 kcal/kg [16.1, 25.4] and 0.81 g/kg [0.61, 1.04] of protein per day. The amount of calories and protein did not differ between groups. OO based PN was significantly associated with better day-28 survival compared to FO (OR 0.44, IC95 0.23–0.87) containing PN in a multivariate model adjusted on admission SOFA and admission diagnosis. No difference was found regarding days of mechanical ventilation, ICU mortality or length of stay in the ICU.

**Conclusion:** In our cohort, OO based PN administration in critically ill patients was associated with improved survival compared to FO. Randomized controlled trials are needed to confirm our results.

#### Reference

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#### SUN-LB643

##### CAN USE OF DIETARY FIBER SHORTEN ICU STAY AND REDUCE MORTALITY IN ICU SETTINGS?: A SYSTEMIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

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**Rationale:** We plan to explore the possible effect of dietary fiber (DF) on reducing mortality or shorten ICU stay in patients with severe diseases.

**Methods:** PubMed, CNKI and Cochrane databases were searched until March 1st, 2019. The searching subject terms in heads, abstracts or main texts included dietary fiber (DF), prebiotics, synbiotics, intensive care medicine, intensive care unit, clinical trial. Reference papers of studies or reviews were also retrieved and screened according to the inclusion and exclusion criteria. Two independent researchers selected randomized controlled trials reporting the DF type, dose, duration and mortality rate and length of stay in ICU and/or hospital. Data analysis was performed using RevMan 5.3 software.

**Results:** Ten studies involving 671 participants were included; Dietary fiber significantly reduced mortality compared with control [Odds Ratio 95% CI, 0.68 (0.47, 0.98), Z = 2.09, P = 0.04, fixed effect model]. However, DF cannot shorten ICU stay when compared with the control arm [SMD 95% CI, -0.14 (-0.38, 0.10), Z = 1.16, P = 0.24, random effect model]. For subgroup analysis, dietary fiber and synbiotics were tested separately. Dietary fiber alone, either as part of EN formula or supplementation, could significantly reduce mortality than the control. Especially in Asian ICU settings, DF plays an essential role in changing the outcome.

**Conclusion:** Dietary fiber could reduce mortality rather than shorten ICU stay. Sensitive analysis revealed that dietary fiber alone can exert the effect especially in Asian ICU patients.

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**Disclosure of Interest:** None declared.

#### SUN-LB644

##### NUTRITIONAL RISK ASSESSMENT IN CRITICALLY ILL PATIENTS USING NUTRITION RISK IN CRITICALLY ILL (NUTRIC) SCORE

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**Rationale:** We aim to assess the nutritional risk in critically ill patients using NUTRIC score – an Intensive Care Unit (ICU) specific nutrition risk assessment tool at Ibrahim Bin Hammad Obaidallah Hospital (IBHOH), Ras Al Khaimah (RAK), United Arab Emirates (UAE).

**Methods:** A prospective observational study was conducted in the ICU at IBHOH for 8 months (June 2017 to January 2018). Institutional ethics committee approval was obtained. Adult patients (>18 years) who were admitted in the ICU and stayed for more than 24 hours were included in the study. To identify the patients at nutritional risk we used modified NUTRIC score (m- NUTRIC score – without IL-6 values) and patients having a NUTRIC score of 0–4 were classified to have low malnutrition risk and those having a score between 5–9 were associated with worse clinical outcomes. SPSS 24 software was used and the difference in the mean of the variables was tested using Z test, which follows normal distribution. All other variables which are not following normal distribution, median test and Chi square test were performed.

**Results:** Data of 50 patients was analyzed. A total of 84% patients had a high NUTRIC score (>5) and 16% had a low NUTRIC score (<4). The length of ICU stay had a median of 9 days for patients with high NUTRIC score and 5 for those with low NUTRIC score, which indicates



higher the NUTRIC score, the length of stay in ICU also increases. The mortality rate in our study was 26% and out of these patients 92.3% had a high NUTRIC score and the remaining 7.7% had a low NUTRIC score which clearly indicates higher the NUTRIC score, higher the mortality rate.

**Conclusion:** We observed high NUTRIC score is associated with increased mortality and ICU length of stay and these patients are most likely to benefit from aggressive nutrition therapy.

#### Reference

1. Identifying critically-ill patients who will benefit most from nutritional therapy: Further validation of the “modified NUTRIC” nutritional risk assessment tool August 2016 Volume 14, Pages 31–36 ©2015 Elsevier Ltd and European Society for Clinical Nutrition and Metabolism.

**Disclosure of Interest:** None declared.

#### SUN-LB645

##### PARENTERAL NUTRITION IN SURGICAL ICU: REFEEDING HYPOPHOSPHATEMIA OR REFEEDING SYNDROME?

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**Rationale:** Hypophosphatemia is a hallmark of refeeding syndrome, but it has no specific clinical manifestations and is often subclinical [1–2]. Since there are many causes of hypophosphatemia, it is unclear how often hypophosphatemia is caused by the resumption of nutrition and how this affects the outcome.

**Methods:** We included patients (n = 75) after abdominal surgery on total parenteral nutrition (TPN) with short-term relative contraindications to early enteral nutrition. We excluded pregnant patients, patients with shock, hyperglycemia more than 20 mmol/l, ketosis, acute renal or/and hepatic failure. We did not provide any additional phosphate replacement. We assessed nutritional risk and refeeding syndrome risk by NRS 2002 and NICE scales. We measured phosphate levels before TPN and after 24 h of TPN. We assessed organ dysfunction and its connection with phosphate levels before and after 24 h of TPN.

**Results:** 57.4% patients had elevated nutritional and refeeding syndrome risk (NRS 2002  $\geq 3$  and more than 2 NICE minor criteria). Before the refeeding, 28 patients (38.9%) had hypophosphatemia (serum phosphate  $< 0.82$  mmol/l), and 2 patients (2.7%) had severe hypophosphatemia ( $< 0.32$  mmol/l). 24 hours after the resumption of nutrition hypophosphatemia had 49 patients (68.1%), and 6 patients – severe hypophosphatemia (8.3%). After 24 h of TPN serum phosphate level significantly decreased in all patients from 0.90 (0.61–1.15) to 0.62 (0.50–0.84) mmol/l,  $p < 0.001$ . Patients who developed delirium (n = 15) had significantly lower baseline phosphate levels (0.73 (0.52–0.93) vs 0.92 (0.74–1.17) mmol/l,  $p = 0.019$ ). All patients on mechanical ventilation (n = 17) had lower but nonsignificant phosphorus level 0.79 (0.61–0.97) vs 0.93 (0.67–1.15) mmol/l ( $p = 0.242$ ). Patients receiving catecholamines (n = 9) had lower but nonsignificant phosphorus level 0.77 (0.60–1.01) vs 0.92 (0.67–1.14) mmol/l ( $p = 0.315$ ).

**Conclusion:** Hypophosphatemia is common in surgical ICU, and refeeding can lead to a significant reduction in serum phosphate levels. Baseline hypophosphatemia can be a predictor of delirium.

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**Disclosure of Interest:** None declared.

#### SUN-LB646

##### PHASE ANGLE (PA) AND MORTALITY IN CRITICALLY ILL ELDERLY PATIENTS AT 28 DAYS AND 60 DAYS

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**Rationale:** Recent studies have shown an association of low phase angle (PA) and mortality during Intensive Care Unit (ICU) stay and after hospital discharge. The objective of this study were to verify PA prognostic value on mortality and also its correlation with severity and function scales in a sample of elderly ICU patients.

**Methods:** Patients older than  $\geq 60$  years, under mechanical ventilation  $\geq 48$  h, length of stay  $\geq 3$  days, hemodynamically stable were studied. PA was measured by a single frequency bioelectrical impedance (BIA) at the 1st day after stability (PA1). Severity (APACHE II, SOFA, SAPS III) and functional scales (Barthel Index) were assessed in the first 24 hours. Mortality after 28 (D28M) and 60 days (D60M), and overall hospital mortality (OHM) were assessed.

**Results:** A sample of 68 elderly patients were enrolled (mean age  $80.2 \pm 9.1$  years, 56.5% female). Sepsis was present in 33 patients (47.8%). The median (interquartile range) of severity and functional scores were 18 (15;22) for Apache II, 5 (4;7) for SOFA, 65 (62;74) for SAPS3 = 67,58 (1,68), and 85 (50;100) for Barthel. Median PA1 was 3.5 (3.0;4.1) and D28M, D60M, and OHM were 35,9%, 44,8%, and 46,6%, respectively. There was no significant correlation between PA1 and Apache II, SOFA, and Saps III scores, but there was a low significant correlation between PA1 and Barthel score ( $r = 0,39$ ,  $p = 0,001$ ). Median PA1 were significantly lower in patients who were dead at D28, D60, or during hospitalization. The area under ROC curve assessing D28M, D60M, and OHM prediction by PA1 was 0.71, 0.77, and 0.80, respectively. We found a cutoff of  $3.29^\circ$ , with a sensitivity of 74% and specificity of 81% to predict OHM.

**Conclusion:** In the elderly ICU patients PA1 don't show any correlation with severity scores, but a low correlation with Barthel score. Survivors patients presented a significantly higher PA1 and  $PA1 \geq 3.29^\circ$  could be used as a survival marker in this population.

**Disclosure of Interest:** None declared.

#### SUN-LB647

##### PYROGLUTAMIC ACIDOSIS BY GLUTATHIONE REGENERATION BLOCKAGE IN CRITICAL PATIENTS

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**Rationale:** To evaluate oxidative stress from glutathione depletion in critically ill patients with septic shock.

**Methods:** Prospective analytical study of 42 critically ill patients with a septic shock who were monitored from admission (initial) to 3 days of stay (final) in the intensive care unit (ICU). Data collected included PyroGlu and glutamic acid (Glu) using liquid chromatography/mass spectrometry, and glutathione peroxidase (GPX) activity with a colorimetric assay.

**Results:** In patients with septic shock, serum and urine PyroGlu levels were higher, erythrocyte GPX activity/gr Hb was lower, and urine Glu levels were lower compared to reference values, for both initial and

final values. Initial serum Glu levels were also lower. Serum PyroGlu levels had a correlation with both initial and final serum Glu levels. Urine Glu/mg creatinine correlated with APACHE II ( $p = 0.03$ ).

**Conclusion:** Septic patients have higher levels of PyroGlu, lower levels of Glu, and lower erythrocyte GPX activity, suggesting that these biomarkers could be used as an indicator of glutathione depletion, being related to severity parameters. This study can guide future studies on the importance of monitoring the levels of pyroglutamic acidosis in critical patients with septic shock in order to preserve the oxidative status and its evolution during the stay in the ICU.

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**Disclosure of Interest:** None declared.

#### SUN-LB648

##### USE A HIGH-PROTEIN TUBE FEEDING IN CRITICALLY ILL PATIENTS: THE RESULTS OF A MULTICENTER STUDY

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**Rationale:** Our observations suggest that most patients the protein less than 0.4 g/kg BW using standard tube feeding. The purpose of this study is to show that in critically ill patients tube enteral feeding with an increased protein content the median time to normalization of nitrogen balance is less than in patients receiving standard nutritional support.

**Methods:** Multicenter randomized clinical trial. 28 patients in the group of the studied product Nutrisone Advanced Protisone (1), and 32 patients in standard nutritional support group (2). inclusion criteria: 1. pts admitted in ICU due to SIRS, sepsis (SOFA 2 points or more), after major GI surgery, or complications after surgical interventions 2. Initiation of tube feeding in the first 24 hours after admission to the ICU. All patients had to receive EN at the rate of 20–25 kcal/kg/day, protein – 1.2 g/kg/day.

**Results:** A statistically significant increase in nitrogen balance relative to baseline was observed only in the group 1 on Day 3 (the median increase was 10 g/day in the group 1, ( $p = 0.006$ ) vs 3.4 g/day in group 2). The amount of enterally administered protein was statistically significantly higher in the group 1 on Day 3 ( $p = 0.032$ ) compared to the group 2. The volume of input and absorbed EN, as well as the amount of energy introduced, did not significantly differ between the groups. The percentage of patients providing daily protein requirements relative to the calculated one was significantly higher in the

group 1, compared to the group2, on Day 3 (96.2% compared to 55.9%, median,  $p = 0.042$ ). We also noted a decrease in the LoS the ICU (25 versus 29 days) and the duration of mechanical ventilation (23 versus 29 days), infection (pneumonia in 8 versus 12 patients), and bedsores (0 versus 5 patients). There were no intolerance of EN in both group.

**Conclusion:** Enteral feeding with high protein resulted in higher protein intake and positive nitrogen balance than an isocaloric EN without an increase in energy intake. This formulae is in according to nutritional guidelines and is suitable as a first-line nutritional treatment for critically ill patients.

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#### SUN-LB649

##### NUTRITIONAL BIOMARKERS IN COMMUNITY-DWELLING OLDER PEOPLE IN SINGAPORE

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**Rationale:** Aging is associated with suboptimal nutritional status and has been linked to adverse health outcomes. The objective of this cross-sectional study was to describe nutritional biomarkers status in community-dwelling older people with a Malnutrition Universal Screening Tool (MUST) score of 0 in Singapore.

**Methods:** A total of 400 (183 males and 217 females) community-dwelling older people aged  $\geq 65$  years took part in this study. Ten biomarkers associated with nutritional status were analyzed, using serum for pre-albumin, albumin, total protein, creatinine, 25-hydroxy vitamin D, vitamin B12, zinc, corrected calcium, ferritin, and using whole blood for hemoglobin.

**Results:** Participants were robust; 98% had a Charlson Comorbidity score of 0. Over 90% of participants had normal level of each of the following biomarkers: pre-albumin, albumin, total protein, creatinine, corrected calcium, and vitamin B12. Almost three quarters (73%) of participants had normal ferritin level and 27% had high ferritin level. Similarly, 81% had normal hemoglobin level and 16% had high hemoglobin level. Prevalence of vitamin D insufficiency was 38.5% ( $20 < 30 \mu\text{g/L}$ ) and a further 13.5% had vitamin D deficiency ( $< 20 \mu\text{g/L}$ ). Overall, 10% had zinc deficiency ( $< 724 \mu\text{g/L}$ ) based on fasting level. The levels of corrected calcium and vitamin B12 were higher in females than in males (both  $P \leq 0.007$ ). The levels of pre-albumin, albumin, creatinine, serum ferritin, 25-hydroxy vitamin D, and hemoglobin were higher in males than in females (all  $P \leq 0.023$ ).

**Conclusion:** The high prevalence of suboptimal vitamin D and zinc status in independently ambulant community-dwelling older people with a MUST score of 0 is concerning and deserves urgent attention. These findings highlight the need for early detection of nutritional insufficiencies in older people and the development of targeted preventive public health nutrition strategies.

**References:** N/A

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#### SUN-LB650

##### PREVALENCE AND FACTORS ASSOCIATED WITH LOW MUSCLE MASS IN COMMUNITY-DWELLING OLDER PEOPLE IN SINGAPORE

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**Rationale:** There is limited evidence on prevalence of low muscle mass in community-dwelling older people with normal nutritional status and factors associated with low muscle mass has not been well characterized in this population group.

**Methods:** This cross-sectional study was designed to examine the prevalence of low appendicular skeletal muscle mass index (ASMI; appendicular skeletal muscle mass/height<sup>2</sup>) in community-dwelling older people with normal nutritional status (Malnutrition Universal Screening Tool score=0) in Singapore and to determine factors associated with low ASMI. Bioelectrical impedance analysis was used to determine ASMI. Low ASMI was defined as <7.0 kg/m<sup>2</sup> for males and <5.7 kg/m<sup>2</sup> for females (Asian Working Group for Sarcopenia, 2014).

**Results:** 400 older people (183 males and 217 females) aged ≥65 years completed the study. Overall prevalence of low ASMI was 20.6%, in which females were more affected than males (24.9% vs. 15.5%;  $P=0.021$ ). In the multiple logistic regression model, age (OR=1.13;  $P<0.001$ ), BMI (OR=0.55;  $P<0.001$ ) and calf circumference (OR=0.80;  $P<0.001$ ) were associated with low ASMI in the total cohort. Bone mass was associated with lower odds of having low ASMI in gender-specific models (both  $P\leq 0.008$ ). After adjusting for covariates, every 10 years increase in age was associated with a 3.4-fold (95% CI: 1.8, 6.2) higher odds of having low ASMI.

**Conclusion:** One in five community-dwelling older people with normal nutritional status had low ASMI. Every 10 years increase in age was associated with a 3.4-fold greater prevalence of low ASMI. BMI, calf circumference and bone mass were associated with lower odds of having low ASMI. These findings could be used to identify older adults who are at risk of low ASMI and devise effective public health strategies to delay the progression to sarcopenia in this population group.

#### Reference

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None declared, R. H. S. Ong: None declared, F. S. Husain: None declared, S. C. Kwan: None declared, C. Y. L. Tan: None declared, Y. L. Low Other: YLL is an employee of Abbott Nutrition., N. C. Tan: None declared, D. T. T. Huynh Other: DTTH is an employee of Abbott Nutrition.

#### SUN-LB651

##### PREVALENCE OF SARCOPENIA IN COMMUNITY-DWELLING OLDER ADULTS IN IRELAND: COMPARISON OF EWGSOP1 AND EWGSOP2 DEFINITIONS

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**Rationale:** In 2010, the European Working Group on Sarcopenia in Older People (EWGSOP) published a definition for the identification of individuals with sarcopenia (EWGSOP1)<sup>1</sup>. In 2018, this definition was updated based on the newest evidence (EWGSOP2)<sup>2</sup>, with the focus now on low muscle strength rather than low muscle quantity as the key characteristic of sarcopenia. The aim of this study was to identify the prevalence of sarcopenia among community-dwelling older adults in Ireland for the first time and to assess agreement between the EWGSOP1 and EWGSOP2 definitions.

**Methods:** In a cross-sectional analysis, 490 community-dwelling adults (age 78 ± 8 y, body mass index 27.6 ± 5.1 kg/m<sup>2</sup>) were assessed. Skeletal muscle mass was estimated using bioelectrical impedance analysis, muscle strength was measured via handgrip dynamometry and physical performance via the Short Physical Performance Battery. Sarcopenia was defined according to both the original criteria (EWGSOP1) and the updated criteria (EWGSOP2).

**Results:** Using the EWGSOP1 definition, the prevalence of sarcopenia was 7.1% (2.6% sarcopenia, 4.5% severe sarcopenia) and 3.6% were classified as pre-sarcopenic (low muscle mass without a decrement in strength or physical performance). Using the EWGSOP2 definition, the prevalence of sarcopenia was 5.5% (1.6% sarcopenia, 3.9% severe sarcopenia) and 23.4% were classified as having low strength but without a decrement in muscle mass. Five of the participants who were classified as sarcopenic (2 sarcopenia, 3 severe sarcopenia) by EWGSOP1 were classified as normal using EWGSOP2.

**Conclusion:** The prevalence of sarcopenia in community-dwelling older adults in Ireland is in line with the prevalence reported in other European countries using the EWGSOP1 definition. We report a slightly lower prevalence using the EWGSOP2 definition compared to the EWGSOP1 definition.

#### References

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**Disclosure of Interest:** None declared.

#### SUN-LB652

##### ESSENTIAL AMINO ACID TRYPTOPHAN HAS A LIVER-PROTECTIVE EFFECT THROUGH THE SUPPRESSION OF INDUCIBLE NITRIC OXIDE SYNTHASE IN PRIMARY CULTURED RAT HEPATOCYTES

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**Rationale:** Essential amino acid tryptophan is a potent endogenous free radical scavenger and antioxidant. Accumulated evidence indicates that amino acids, particularly tryptophan, exert a protective effect against a variety of organ inflammation and injury. However, there are few scientific reports about the mechanisms involved in anti-inflammatory action of tryptophan on organ damage, including liver. Pro-inflammatory cytokine interleukin (IL)-1 $\beta$  stimulates the induction of inducible nitric oxide synthase (iNOS) expression and nitric oxide production in primary rat cultured hepatocytes, and the prevention of iNOS expression and nitric oxide production is considered to be an indicator of liver protection. This study aimed to examine whether tryptophan influences the induction of iNOS gene expression and the mechanisms involved.

**Methods:** Hepatocytes were isolated from rats (male Wistar, 200–250 g) by collagenase perfusion and low centrifugation, and cultured. Tryptophan was added into primary cultures of rat hepatocytes stimulated by IL-1 $\beta$ . The iNOS induction, nitric oxide production and its signaling pathway were analyzed.

**Results:** IL-1 $\beta$  induced iNOS gene expression, which was followed by iNOS expression and nitric oxide production. Tryptophan inhibited the expression of iNOS mRNA and protein, and decreased the production of nitric oxide. Tryptophan blocked two essential signaling pathways, the activation of nuclear factor (NF)- $\kappa$ B and upregulation of type I IL-1 receptor (IL-1RI); Tryptophan had no effects on the degradation of I $\kappa$ B, but inhibited NF- $\kappa$ B activation, its nuclear translocation from cytoplasm and DNA binding. Tryptophan also inhibited the phosphorylation of Akt, down stream kinase of phosphatidylinositol 3-kinase, which was followed by the reduction of IL-1RI protein expression.

**Conclusion:** Results indicate that tryptophan can prevent nitric oxide production by the suppression of iNOS gene, in part through the inhibitions of NF- $\kappa$ B activation and IL-1RI upregulation, in inflamed hepatocytes.

#### Reference

Miki H, et al. Elental<sup>®</sup> amino acid component has protective effects on primary cultured hepatocytes and a rat model of acute liver injury, *Nutrition Research* 2017; 42: 71–84.

**Disclosure of Interest:** None declared.

#### SUN-LB653

##### OMEPRAZOLE INHIBITS A PRODUCTION OF PROINFLAMMATORY BIOMARKER NITRIC OXIDE IN INTERLEUKIN-1 $\beta$ STIMULATED HEPATOCYTES

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**Rationale:** Proton pump inhibitors (PPIs) are proven to possess other therapeutic potentials apart of acid anti-secretory actions. We found that lansoprazole (PPIs) inhibited the induction of inducible nitric oxide synthase (iNOS) gene expression in cultured hepatocytes and prolonged the survival in a rat model of liver injury (Nakatake et al. *Dig Dis Sci* 2019 in press). However, there is little evidence that another PPI omeprazole affects inflammatory mediators, such as NO and TNF- $\alpha$ , and has a liver-protective effect. This study aimed to investigate liver protective effects of omeprazole by examining iNOS induction in IL-1 $\beta$ -stimulated hepatocytes.

**Methods:** Hepatocytes were isolated from rats (male Wistar, 200–250 g) by collagenase perfusion and cultured. Cells were treated with IL-1 $\beta$  in the presence or absence of omeprazole. iNOS induction and its signaling pathway were analyzed.

**Results:** In IL-1 $\beta$  stimulated cells, omeprazole decreased expression levels of iNOS mRNA and protein, resulting in the inhibition of NO production. Omeprazole inhibited the activation of NF- $\kappa$ B (its translocation from the cytoplasm to nucleus and DNA binding). Omeprazole further blocked the type I IL-1 receptor upregulation (another essential signaling pathway for iNOS induction) through phosphatidylinositol 3-kinase/Akt. Transfection experiments revealed that omeprazole reduced iNOS mRNA levels at both promoter transactivation (mRNA synthesis) and mRNA stabilization steps.

**Conclusion:** Omeprazole affects one of proinflammatory mediator induction, such as iNOS in hepatocytes. Omeprazole may play an important regulatory role in the host response during liver injury and have therapeutic potential for organ injuries, including the liver.

#### Reference

Nakatake et al. The Proton Pump Inhibitor Lansoprazole Has Hepatoprotective Effects in In Vitro and In Vivo Rat Models of Acute Liver Injury. *Dig Dis Sci* 2019 in press.

**Disclosure of Interest:** None declared.

#### SUN-LB654

##### A SYSTEMATIC REVIEW OF DIETARY INTAKE CHANGE IN PEOPLE WHO LIVE WITH AND BEYOND CANCER

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**Rationale:** People who live with and beyond cancer are thought to be highly motivated to change their dietary intake. However, it has not been documented what specific dietary changes people make after a cancer diagnosis. In this systematic review, we summarized the evidence on changes in dietary intake and supplement usage.

**Methods:** A systematic search of the electronic database was conducted by using medical subject headings (MeSH) and text words related to cancer and dietary change. Title and abstracts were screened and full texts were identified through online software and data were extracted. Quality of studies was assessed using the Joanna Briggs Institute Critical Appraisal Checklist.

**Results:** We identified 43 studies with 238,140 participants diagnosed with breast, colorectal and other types of cancer, age range 18–75 years. 30 studies assessed dietary changes over time with a mean 3.6 (SD 3.4) years follow up. Out of these 30 studies, an increase in fibre, fruit and vegetable and whole grain intake was showed in 3 (10%), 2 (6.6%) and 3 (10%) studies, respectively, while 4 (13.3%) studies found a decrease in red meat. Out of 20 studies assessing supplement use, 6 (30%) studies reported supplement use before and after cancer diagnosis and 3 (15%) studies found an increase in supplement use after diagnosis. Out of 8 studies comparing dietary intake between cancer survivors and healthy people, 3 studies showed that cancer survivors increased fruit and vegetable consumption compared to non-cancer controls.

**Conclusion:** We conclude that there is evidence that people after cancer were motivated to change their diet without any intervention in a small number of studies. However, the majority of evidence showed no changes indicating that a cancer diagnosis alone is insufficient to motivate people to change to a healthier eating pattern, suggesting most people after cancer would potentially benefit from a supportive dietary intervention.

#### Reference

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survivorship: A review of the literature”, *British Journal of Cancer*, 105(Suppl 1), pp. S52–S73.

**Disclosure of Interest:** None declared.

#### SUN-LB655

##### AGE AND SEX RELATED VARIATIONS IN BODY COMPOSITION DURING NEOADJUVANT CHEMOTHERAPY FOR OESOPHAGEAL CANCER

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**Rationale:** CT-based cutoff values for determining low skeletal muscle volume in cancer patients have been derived by optimal stratification, and are sex and BMI-specific. The aim of the present study was to investigate the age and sex-specific differences in skeletal muscle, visceral (VAT) and subcutaneous adipose tissue (SAT) in patients suitable for suitable resection of oesophageal cancer.

**Methods:** This was a retrospective, observational, single-centre study. Medical records of patients who underwent neoadjuvant chemotherapy followed by oesophagectomy were reviewed. Cross-sectional areas at the third lumbar vertebrae on routine staging and post-chemotherapy CT scans were measured, and skeletal muscle, visceral and subcutaneous adipose tissue indexed for height. Intra-muscular fat cross-sectional area (CSA) was also recorded. The associations between age, sex, skeletal muscle and adipose measurements were examined.

**Results:** 71 patients were included (56 males and 15 females). Significant differences in body composition at diagnosis were seen between males and females, and those above and below 60 years of age. Males had a higher baseline muscle and visceral adipose tissue mass ( $p = 0.0123$  and  $p = 0.016$ ) whereas females had higher levels of subcutaneous fat ( $p = 0.017$ ). All patients were found to lose muscle volume during chemotherapy, but there was no difference between rates of wasting by age or sex. However, older patients had significantly more total fat loss and females lost significantly more subcutaneous fat during chemotherapy ( $p = 0.024$  and  $p = 0.05$  respectively).

**Conclusion:** Rates of adipose wasting appear to be age-specific and sexually dimorphic in oesophageal cancer. Further studies are required to define alterations in different adipose depots during cancer progression and their prognostic value.

**References:** N/A

**Disclosure of Interest:** None declared.

#### SUN-LB656

##### EXPERIENCES OF ENTERAL NUTRITION IN PATIENTS WITH HEAD AND NECK CANCER UNDERGOING RADICAL RADIOTHERAPY: A QUALITATIVE APPROACH

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**Rationale:** Patients with head and neck cancer (HNC) undergoing radical radiotherapy (RT) frequently experience impaired nutritional and functional status. This requires enteral nutrition (EN) via either prophylactic gastrostomy (G) or reactive nasogastric (NG) tube. Limited qualitative data exists regarding the patient experience. The study aimed to gain an understanding of the patient’s experience of EN to enable future recommendations for services that best meet and address patient needs.

**Methods:** Face to face interviews were conducted with 29 patients, diagnosed with oropharyngeal cancer who required EN, whilst

undergoing radical RT. Interviews were digitally recorded, transcribed verbatim and thematically analysed.

**Results:** 20 male and 9 female participants were interviewed, age range 41–81 years (mean 62 years). 18 participants had G tube placed prophylactic and 11 had a reactive NG tube. Patients who had G tube reported confidence issues, health care professional’s (HCP’s) attitude and lack of support when commencing EN. Conversely, those fed via NG tube felt fully competent and supported on commencement but reported an awareness of the tube in situ and reported fear of misplacement. All participants reported that EN had become a routine and they identified the importance of it in their survival. However, although those with NG were reticent due to body image issues, both groups reported they felt too unwell for social interactions.

**Conclusion:** This study did not demonstrate a clear preference for either G or NG tube. An overarching premise was that patient choice is fundamental. HCPs need to acknowledge and support this. Policies and procedures should be designed and implemented which reflect true patient centred care.

#### Reference

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**Disclosure of Interest:** None declared.

#### SUN-LB657

##### HANDGRIP STRENGTH SIGNIFICANTLY IMPROVED AFTER 3-MONTH PHYSICAL AND NUTRITIONAL THERAPY IN ADVANCED CANCER PATIENTS

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**Rationale:** Malnutrition in cancer patients is a complex problem and requires a multimodal approach. The following analysis investigated physical performance and body composition of patients participating in a multimodal trial.

**Methods:** Advanced cancer patients participated in a 12-week randomized controlled trial including training sessions, nutrition counselling and a leucine-rich supplement. Patients in the control group received usual care. Physical performance was measured using the short physical performance battery (SPPB, primary endpoint), handgrip strength, timed up-and-go and 60-seconds sit-to-stand test. Body composition was measured using bioelectrical impedance analysis.

**Results:** A total of 52 patients were randomized to the intervention ( $n = 27$ ) or control group ( $n = 25$ ). The 23 women and 29 men with an average age of  $63.1 \pm 10.3$  years had a BMI of  $25.4 \pm 4.7$  kg/m<sup>2</sup> at study inclusion. Patients in the intervention group had a SPPB of  $10.9 \pm 1.4$  at baseline and  $11.3 \pm 0.9$  at three months. Patients in the control group had a SPPB of  $10.3 \pm 2.0$  at baseline and  $10.1 \pm 2.9$  at three months. The difference between the groups was not significant ( $p = 0.128$ ). In contrast, handgrip strength improved significantly from  $35.8 \pm 9.8$  kg at baseline to  $37.6 \pm 10.0$  kg at three months in the intervention group compared to  $35.7 \pm 8.8$  kg at baseline to  $34.0 \pm 10.1$  kg at three months in the control group ( $p < 0.001$ ). Further tests for physical performance as well as body composition did not change significantly between the groups after three months.

**Conclusion:** The present trial showed a significant improvement of handgrip strength through the implementation of a multimodal therapy in advanced cancer patients. However, no improvements in

further physical performance tests, especially in the primary endpoint SPPB as well as the body composition were seen.

**Disclosure of Interest:** None declared.

#### SUN-LB658

##### HOME ENTERAL NUTRITION AFTER MINIMALLY INVASIVE ESOPHAGECTOMY CAN IMPROVE QUALITY OF LIFE AND REDUCE THE RISK OF MALNUTRITION

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**Rationale:** The potential benefits of home enteral nutrition (HEN) and the effects of HEN on quality of life (QOL) after esophagectomy remain unclear. The aim was to investigate the effect of 3 months HEN on health related QOL and nutritional status of esophageal cancer patients who were preoperatively malnourished.

**Methods:** 142 malnourished (PG-SGA stage B or C) patients with esophageal cancer were assigned to receive Ivor Lewis minimally invasive esophagectomy (MIE group) with laparoscopic jejunal feeding tube placement or open esophagectomy (OE group) with nasojejunal feeding tube placement. After discharge, patients in the MIE group received HEN with 500–1000 kcal/d for 3 months, while the OE group patients did not receive HEN, as nasojejunal feeding tubes had been removed. QLQ-C30 and PG-SGA questionnaires were used to evaluate the QOL and the risk of malnutrition.

**Results:** 67 patients were enrolled in the MIE group and 75 patients were enrolled in the OE group. Symptoms related to fatigue, nausea, vomiting, pain, and appetite loss were significantly decreased in the patients treated with 3 months HEN. Similarly, patients treated with 3 months HEN had a lower risk of malnutrition than patients did not receive HEN (PG-SGA score, 5.7 vs 7.9,  $p < 0.01$ ). More patients in the MIE group (received 3 months HEN) were able to complete postoperative chemoradiotherapy than patients in the OE group ( $p < 0.01$ ).

**Conclusion:** MIE and subsequent treatment with 3 months HEN can improve the QOL and reduce the risk of malnutrition in preoperatively malnourished patients.

**References:** None.

**Disclosure of Interest:** None declared.

#### SUN-LB659

##### HOW IS NUTRITION BEING DELIVERED ACROSS CANCER CARE SETTINGS: SIGNALS FROM THE INTERNATIONAL NUTRITION AUDIT IN FOREGUT TUMORS (INFORM)

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**Rationale:** Providing nutrition for patients with head and neck (HN) and esophageal (E) cancers (CA) is challenging due to the complex nature of their prolonged disease trajectory. Despite their risk for developing CA-associated malnutrition and cachexia, little is known about how well nutrition is being delivered to this population.

**Methods:** In a multicenter prospective audit, adult pts with curative HN or E CA were enrolled from 11 international cancer care settings. Details on the timing of assessment, nutrition needs, swallowing ability, type and route of nutrition and percentage target calories and protein received were collected over six months by the dietitian/

nutritionist. Descriptive analyses using means, standard deviation and percentages are used.

**Results:** Between 2016 and 2018, 170 pts (121 HN and 49 E CA) were enrolled. Pts had an average age of 63 yrs, Body Mass Index of 26.7 and majority were assessed by a nutrition expert before radio/chemotherapy or within one month of diagnoses. At baseline, 47% had swallowing problems and average nutrition prescription was 29.7 kcal/kg/day, 1.53 g/kg/day protein. Over 6 months, 86% received an oral diet, of these 84% also received oral nutrition supplements. Enteral nutrition (EN) was received by 54% pts for an average of 62.7 days per pt for reactive (58%) vs. proactive (42%) reasons with the gastric route being preferred to jejunal (66% vs. 34%). A total of 45% pts received oral plus EN for an average of 54 days while <1% received PN (alone or combined with EN and oral). Average percentage target calories and protein received from oral were 53% and 47%; EN 90% and 88%; PN 80% and 90% ( $n = 1$ ).

**Conclusion:** Current nutrition practices across international CA care settings suggest that there is room for improvement in the delivery of nutrition based on the targets of prescribed nutrition received.

**Funding:** This study is partially funded by Fresenius Kabi Deutschland GmbH and Baxter.

#### Reference

International Nutrition Audit in FOREgut TuMors (INFORM)  
ClinicalTrials.gov Identifier: NCT0282948

**Disclosure of Interest:** M. A. de van der Schueren: None declared, L. Gramlich Grant/Research Support from: Fresenius-Kabi, Nutricia, Baxter, R. Dhaliwal Other: Baxter, Nestle.

#### SUN-LB660

##### IMPACT OF BODY MASS INDEX AMONGST PATIENTS WITH GASTRIC CARCINOMA: A MULTICENTRAL STUDY

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**Rationale:** Gastric cancer (GC) remains a common cancer in Turkey. There is increasing evidence of an association between obesity and risk of GC. Body mass index has been suggested to correlate with clinicopathologic factors in GC and increase the risk of death. We define clinical and pathological variables of GC. We aimed to analyze the impact of BMI on clinical predictive markers in Turkish GC pts in this registry.

**Methods:** GC patients registered in two medical oncology clinics were included in the analysis. Patients were stratified according to BMI: <18.5 (underweight), 18.5–25 (normal weight), 25.1–30 (overweight), and >30 (obese). Surgical outcomes and clinicopathologic factors were analyzed using Pearsons correlation, spearman correlation and chi-square test when appropriate.

**Results:** 691 patients were examined. 67.9% ( $n = 469$ ) were male; median age (range) was 62 (23–92). Disease was localized at antrum (47.7%), gastroesophageal junction (31.4%) and other. Median BMI (range) was 23 (12–44). Of these, 53 (7.7%) with <18.5, 394 (57%) 18.5–25, 181 (26.2%) 25.1–30, and 63 (8.9%) >30 (obese). There was a weak positive correlation between age and BMI ( $p = 0.0001$ ). Low BMI was associated with a lower number of metastatic lymph nodes ( $P = NS$ ), high number of examined total lymph node count ( $p = 0.0001$ ,  $r = -0.08$ ) and operability ( $p = 0.001$ ). However, tumor location, size, pathologic stage, metastatic site, histopathology, obstruction, perforation were not significantly associated with BMI. Additionally, the use of neoadjuvant chemoradiotherapy or adjuvant chemotherapy/radiotherapy was not associated with BMI. Increased BMI was associated with the use of neoadjuvant chemotherapy ( $p = 0.011$ ).



**Conclusion:** BMI does not have any impact on the clinicopathologic features of GC, but rather an indication of physical fitness. Low BMI was associated with operability and higher number of examined lymph node count. But there was no association with tumor localisation, size, pathologic stage and metastasis.

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**Disclosure of Interest:** None declared.

#### SUN-LB661

##### NUTRITIONAL ASSESSMENT OF HEAD AND NECK CANCER PATIENTS. A THIRD LEVEL HOSPITAL'S EXPERIENCE

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**Rationale:** Head and neck cancer (HNC) is a heterogeneous group of tumors with high risk of malnutrition. The early establishment of a proper nutritional support is essential to improve nutritional status and clinical outcomes.

**Methods:** This is a retrospective observational study. All HNC patients from the committee were included from December 2017 to December 2018 (N = 145). Patients who were not evaluated by our department were excluded from the study (n = 57). Nutritional markers such as anthropometrical and biochemical data was analyzed before and after the surgery.

**Results:** 88 patients were evaluated. Age at diagnosis: 62.97 ± 11.78 years old; 79.5% ♂. Charlson comorbidity index: 3.95 ± 1.88 points. 53.4% of patients were evaluated before the surgery, 44.3% were evaluated during the hospitalization and only 62.5% were reevaluated after the surgery. 35.2% of our patients met criteria of malnutrition (percentage of weight loss > 10% in the last 6 months or >5% in the last 3 months; BMI <18.5 kg/m<sup>2</sup> or albumin <3 g/dl): n = 8 mild, n = 13 moderate, n = 10 severe. 59.1% (n = 52) received any kind of nutritional support during the follow up. Thirty six patients (40.9%) needed a feeding tube meanwhile only two patients (2.27%) needed parenteral nutrition during hospitalization. We found differences between patients that received nutritional assessment and those who did not, regarding initial weight (73.86 vs 66.39 kg; p = 0.025); % of weight loss (3.62 vs 8.91%; p = 0.004), initial albumin (4.28 vs 3.90 g/dl p = 0.019) and final vitamin D levels (17.58 vs 30.69 ng/dl; p = 0.019). We did not find differences with regard to surgery complications (p = 0.147), readmission during the first year (p = 0.466), need of second surgery (p = 0.432), recurrences (p = 0.280) or exitus (p = 0.264).

**Conclusion:** HNC patients are at high risk of malnutrition. In spite of planning a proper perioperative nutritional support, we do not get as good results as we expected. This could be explained by only malnourished patients and therefore, those with the poorest prognosis, are evaluated and treated by our department.

**Disclosure of Interest:** None declared.

#### SUN-LB662

##### NUTRITIONAL STATUS AND ANTHROPOMETRICAL MEASUREMENTS IN CANCER PATIENTS REFERRED FOR INPATIENT PARENTERAL NUTRITION: PRELIMINARY ANALYSES FROM A UK TERTIARY REFERRAL CENTRE

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**Rationale:** Malnutrition in cancer patients is common and when enteral nutrition cannot meet requirements, patients may start parenteral nutrition (PN). In practice malnutrition is often assessed via conventional measures with limited use of other anthropometrics. We examined a variety of nutritional and anthropometric measures in cancer patients referred for PN.

**Methods:** Of 85 (non)cancer patients referred for inpatient PN, 28 patients with active cancer were included (inclusion criteria: >18 yrs, capacity to consent, started on PN at University College London Hospital-UCLH) between Jan-May 2019. Medical and anthropometric data, Karnofsky- and WHO-Performance Status (KPS, WPS), and nutritional risk (using UCLH Screening Tool-NST and Subjective Global Assessment PG-SGA), were recorded.

**Results:** 28 patients (median age: 59yrs (range: 21–83) and 55.2% female) with primary malignancies of mainly gastrointestinal (n = 14/28) and hematological (n = 10/28) origin. Baseline prognostic scores were modest: WPS: 2 (1–4), KPS: 60 (40–80), & GPS 1 (0–2). There was high risk of malnutrition on both nutrition screening tools (UCLH-NST score 8; PG-SGA: 11). Patients had a normal weight and BMI (56 kg: 35.1–102.2); BMI 20.7 kg/m<sup>2</sup>: 12.4–33.4), however, significant weight loss in past 0–6 months 22.5% (–0.45–85.7). However, hand grip strength was below reference values: left 38.6 kg (13.6–93.7), right 38.9 kg (13.3–85.9), lower triceps skinfold 9 mm (3.8–31.6), borderline mid-upper arm circumference 25.3 cm (16.7–32.1), and MAMC 21.1 cm (15.1–28.8).

**Conclusion:** Baseline weight and BMI were normal; however, hand grip strength and triceps skinfold were below normal. Our findings suggest that additional nutrition measures provide more information regarding body composition and muscle function in cancer patients.

#### Reference

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**Disclosure of Interest:** M. Plyta: None declared, P. Patel Grant/Research Support from: Calea, Fresenius Kabi, UK., N. Keane: None declared, E. Holmes: None declared, K. Fragkos: None declared, G. Sebeos-Rogers: None declared, J. Barragry: None declared, J. Rogers: None declared, G. Crutchley: None declared, T. Jacinto: None declared, S. Mehta: None declared, F. Rahman: None declared, S. Di Caro : None declared.

#### SUN-LB663

##### NUTRITIONAL STATUS IN PATIENTS WITH HEPATOCELLULAR CARCINOMA DEPENDING ON BARCELONA CLINIC LIVER CANCER STAGING CATEGORY

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**Rationale:** Malnutrition is considered to be a common, but frequently underdiagnosed condition in patients with hepatocellular carcinoma (HCC). Poor nutritional status has been shown to have negative influence on survival in HCC patients. There is no commonly accepted gold standard for the diagnosis of malnutrition in these patients but low BIA-derived PhA (≤5,18°) is an independent factor of poor prognosis in HCC patients.

**Methods:** We have enrolled 20 patients with HCC out of total 243 patients with liver cirrhosis of different etiologies (chronic hepatitis B

and C, alcoholic liver disease, non-alcoholic steatohepatitis, primary biliary cholangitis) hospitalized in our department in 2018. 25% (5 patients) were female, 75% (15 patients) were male. 25% (5 patients) fulfilled criteria of BCLC A category, 40% (8 patients) – BCBL B category and 35% (7 patients) – BCLC C category. For the nutritional status body mass index (BMI), serum albumin concentration, white blood cells count (WBC) and BIA-derived PhA were evaluated. Test T and Chi2 were performer.

**Results:** We have enrolled 20 patients with HCC out of total 243 patients with liver cirrhosis of different etiologies (chronic hepatitis B and C, alcoholic liver disease, non-alcoholic steatohepatitis, primary biliary cholangitis) hospitalized in our department in 2018. 25% (5 patients) were female, 75% (15 patients) were male. 25% (5 patients) fulfilled criteria of BCLC A category, 40% (8 patients) – BCBL B category and 35% (7 patients) – BCLC C category. For the nutritional status body mass index (BMI), serum albumin concentration, white blood cells count (WBC) and BIA-derived PhA were evaluated. Test T and Chi2 were performer.

**Conclusion:** In our study good nutritional status was observed only in patients of BCLC A category. This may be a proof that poor prognosis of BCLC B and BCLC C stages results not only from the tumour stage, liver function and patient's performance but also from malnutrition that progresses in the course of the disease.

#### Reference

Meza-Junco J. *et al.* 'Sarcopenia as a Prognostic Index of Nutritional Status in Concurrent Cirrhosis and Hepatocellular Carcinoma,' *J. Clin. Gastroenterol.*, vol. 47, no. 10, pp. 861–870, 2013.

**Disclosure of Interest:** None declared.

#### SUN-LB664

##### SCREENING FOR NUTRITION RISK: RESULTS FROM THE INTERNATIONAL NUTRITION AUDIT IN FOREGUT TUMORS (INFORM) STUDY

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**Rationale:** Patients with esophageal (E) and head & neck (HN) cancers (CA) are at high risk for malnutrition. Identification of nutrition risk is essential to guide nutrition care. The Patient Generated-Subjective Global Assessment (PG-SGA) is a validated nutrition risk screen for oncology. We report changes in the PG-SGA over the course of treatment in patients with E and HN CA.

**Methods:** A multicenter prospective audit of adult patients undergoing curative treatment for HN or E CA. Enrolled patients were from 11 cancer centers in Canada, Netherlands, Italy, Australia and United States. Dietitians/nutritionists administered the PG-SGA over the course of treatment: baseline (admission to cancer center), at 2, 4 and 6 months. PG-SGA scores  $\geq 9$  indicate a critical need for nutrition intervention/symptom control. Descriptive statistics are presented.

**Results:** From Aug 2016-March 2018, 170 patients were enrolled. At baseline, mean PG-SGA scores were  $10 \pm 6$ ; patients lost a mean of 2.4 kg (3.5%) in the previous 6 months and had high prevalence of nutrition impact symptoms (NIS): problems swallowing (36%), pain (31%), no appetite (22%), and fatigue (21%). At 2 months, PG-SGA scores increased from baseline to  $13 \pm 7$  ( $P < 0.001$ ), declining to  $9 \pm 5$  at 4 and 6 months ( $P > 0.05$  from baseline). Weight loss accelerated at 2 and 4 months with losses of 4.3 kg ( $P = 0.03$ ) and 2.4 kg ( $P = 0.002$ ), respectively, but stabilized by 6 months. NIS significantly increased ( $P < 0.001$ ) at 2 months, with some decline by months 4–6 ( $P > 0.05$  from baseline); NIS taste/smell alterations, dry mouth, and problems swallowing remained prevalent at month 6.

**Conclusion:** These results highlight the need for continuous nutrition risk assessment and tailored nutrition interventions throughout the treatment trajectory of patients with HN and E CA.

**Funding:** This study is partially funded by Fresenius Kabi Deutschland GmbH and Baxter.

#### Reference

International Nutrition Audit in FOREgut TuMors (INFORM) ClinicalTrials.gov Identifier: NCT0282948

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#### SUN-LB665

##### STABILITY OF THE NEUROMUSCULAR JUNCTION IN CANCER CACHEXIA

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**Rationale:** Cancer cachexia is a major cause of patient morbidity and mortality, with no efficacious treatment or generally-accepted management strategy. Despite sharing pathophysiological features with a number of other neuromuscular wasting conditions, the mechanisms underlying cachexia remain poorly understood. Studies using animal models have suggested that pathological targeting of the neuromuscular junction (NMJ) may play a key role in the pathogenesis of cachexia, but this has yet to be investigated in human patients.

**Methods:** High-resolution morphological analyses were undertaken on NMJs in samples of rectus abdominis muscle obtained from patients undergoing surgery for upper GI cancer compared with control cases. Cancer patients included those with both cachexia (according to the consensus definition) and weight stable disease ( $n = 6$  per group).

**Results:** There were six patients analysed per group providing a total of 240 NMJ's. Patients in the cachectic group had a mean weight loss of  $10.1\% \pm 2.41\%$  and a mean SMI of  $37.32 \pm 1.79$ . Despite a significant degree of muscle fibre atrophy noted in patients with cachexia compared to weight stable cancer and control patients, NMJ morphology was fully conserved, with no significant differences observed in any of the twenty-one pre- and post-synaptic parameters measured (including axon diameter, nerve terminal area, nerve terminal complexity and percentage overlap between pre- and post-synaptic structures).

**Conclusion:** NMJs remain structurally intact and conserved during cancer and cachexia, suggesting that denervation of skeletal muscle is not a major driver of pathogenesis. The absence of NMJ pathology in human cancer is in contrast to observations noted in animal models, and supports the hypothesis that intrinsic changes within skeletal muscle, independent of any changes in motor neurons, represent the primary locus of pathology in cachexia.

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Jones *et al.* Cellular and molecular anatomy of the human neuromuscular junction. *Cell Reports* 2017;21:2348–2356.

**Disclosure of Interest:** None declared.

**SUN-LB666****DO LONGITUDINAL EPIGENETICS CHANGES AFTER A 6-WEEKS OF HYPOCALORIC DIETARY INTERVENTION CAN MODULATE CANCER PATHWAYS?**

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**Rationale:** Evidence has shown that weight loss-interventions could dynamically and reversibly modulate DNA methylation levels. This study investigated: 1. the role of a hypocaloric dietary intervention on global and promoter-specific DNA methylation; 2. possible changes in genes related to cancer pathways.

**Methods:** For this, 11 obese ( $36.9 \pm 10.3$  y,  $58.5 \pm 10.5$  kg/m<sup>2</sup>) and 24 normal-weight ( $36.9 \pm 11.8$  y,  $22.5 \pm 1.6$  kg/m<sup>2</sup>) women were enrolled. Anthropometric evaluation and blood collection were performed before and after a 6-weeks of a hypocaloric diet (1,200 kcal/day). DNA methylation was analyzed in DNA extracted from peripheral leukocytes using Infinium Human Methylation 450 BeadChip assay. This array contains 485,577 probes, which cover 21,231 (99%) RefSeq genes. All genome-wide DNA methylation data was analyzed by parametric t test. CpG sites with a false discovery rate <5%, raw *p* values <0.01 and methylation change >10% were considered significant. Gene ontology analysis was performed using WEBGestalt.

**Results:** There was a weight reduction of 5.6%. Analysis showed that 505 genes were differently methylated between obese and normal weight women and changed with the intervention. After diet, 264 genes remained different from control group, while 241 become similar to normal weight individuals (*AKT3*, *RHOQ*, *HIP1R* and *INPP5A*, which were from PI3 kinase, pyruvate metabolism, TCA cycle, and p53 pathway by glucose deprivation). On another hand, important genes such as *CTNNA1*, *CTNNA2*, *WNT5B*, *FYN*, *PRKCA*, *PRKCB* and *PCDHGB1* from cadherin, Wnt pathway and angiogenesis signaling were always different from control group. As our main results, we observed that 1. dietary intervention was able to modify (hypermethylate) cancer-related genes; 2. these pathways was always less methylated when comparing to control group, even after diet.

**Conclusion:** In conclusion, 6-weeks of hypocaloric dietary intervention can promote epigenetic changes of cancer-related pathways; however, it is not enough to become equal normal weight women.

**Reference**

SAMBLAS M.; MANSEGO M.L.; ZULET M.A.; MILAGRO F.I.; MARTINEZ J.A. An integrated transcriptomic and epigenomic analysis identifies CD44 gene as a potential biomarker for weight loss within an energy-restricted program. *Eur J Nutr*. 2018.

**Disclosure of Interest:** None declared.

**SUN-LB667****EFFECTS OF METABOLIC SYNDROME AND ITS COMPONENTS ON ARTERIAL STIFFNESS IN ASYMPTOMATIC KOREAN POPULATION**

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**Rationale:** Metabolic syndrome (MS) is known a risk factor for cardio- and cerebro-vascular disease. Arterial stiffness (AS) is an early marker of systemic atherosclerosis. Cardio-ankle vascular index (CAVI) represents the stiffness of the whole artery, is easy to measure, independent of blood pressure (BP), and has better reproducibility than brachial-ankle pulse wave velocity. The relationship between AS and presence of MS, in addition to age and sex as confounders were investigated to identify the characteristics of CAVI.

**Methods:** A cross-sectional study was conducted for 2251 health check-up subjects (1599 males and 652 females), aged 21–81 years, who had undergone anthropometric measurement, metabolic blood work, and CAVI, simultaneously. The classification of MS followed the revised National Cholesterol Education Program criteria. Multiple logistic regression analysis was performed to analyze the association. A predefined CAVI cutoff value of 8 was used for analysis, based on previous studies demonstrated that  $CAVI \geq 8$  was associated with significant coronary stenosis or calcification in asymptomatic subjects and is the optimal cutoff for predicting carotid arteriosclerosis.

**Results:**

MS was present in 1118 subjects (49.7%). Significant association between  $CAVI \geq 8$  and MS (OR 1.53, 95% CI 1.25–1.87,  $p < 0.001$ ) was recognized after adjusting age and sex. Only high BP (OR 1.88, 95% CI 1.49–2.37,  $p < 0.001$ ) of 5 metabolic components showed significant association with  $CAVI \geq 8$  after adjusting age, sex, smoking, alcohol drinking, and exercise.

**Conclusion:** Presence of MS, as well as age, associated with AS. Among 5 components of MS, high BP has significant association with AS.

**Reference**

Park JB, et al. Relation between cardio-ankle vascular index and coronary artery calcification or stenosis in asymptomatic subjects. *J Atheroscler Thromb*. 2013;20(6):557–567.

**Disclosure of Interest:** None declared.

**SUN-LB668****HYPOCALORIC DIET CHANGES DNA METHYLATION OF GENES INVOLVED WITH INFLAMMATORY PATHWAYS IN WOMEN WITH GRADE III OBESITY**

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**Rationale:** DNA methylation is an important epigenetic marker in the determination of biological processes and diseases in humans, including obesity.

**Methods:** This is a longitudinal intervention study, which 11 women ( $35.7 \pm 5.1$  years) with grade III obesity were submitted to a hypocaloric dietary intervention (1200 kcal/day) for 6 weeks. Anthropometric data [weight, BMI], body composition [fat free mass (FFM) and fat mass (FM)] and peripheral blood for methylation analysis were collected before and after intervention. Genome-wide methylation analysis was conducted using the Infinium HumanMethylation450 BeadChip. For statistical analysis, Shapiro-Wilk, Wilcoxon and Mann-Whitney test were used ( $p < 0.05$ ). We

**Table** (abstract: SUN-LB667).

Variables	metabolic syndrome	age	sex (male)	High Blood Pressure	High Fasting Glucose	High Triglyceride	Low HDL-cholesterol	Abdominal obesity
Odds ratio (95% Confidence Interval)	1.53 (1.25–1.87)	1.16 (1.14–1.18)	1.42 (1.13–1.78)	1.88 (1.50–2.37)	1.56 (0.34–7.15)	1.29 (0.89–1.63)	1.13 (0.85–1.49)	0.84 (0.69–1.04)



applied a threshold for the significant CpG sites based on  $\Delta\beta$  with a minimum value of 10% and a  $p$ -value less than 0.01.

**Results:** A significant weight loss of  $9.2 \pm 3.6$  kg (5.6%,  $p < 0.003$ ) was observed after 6 weeks of dietary intervention, in addition to reduction in BMI ( $59.8 \pm 11.0$  to  $56.3 \pm 9.7$  kg/m<sup>2</sup>  $p < 0.003$ ), FFM ( $66.2 \pm 9.0$  to  $63.7 \pm 7.7$  kg;  $p < 0.006$ ) and FM ( $91.9 \pm 24.5$  to  $85.1 \pm 22.1$  kg;  $p < 0.003$ ). The evaluation of the genes related to inflammation showed changes in methylation levels at 20 CpG sites, 9 of which were hypomethylation (*TNF, IL1A, IL6R, HGF, CCL2, CCL28, RIPK1, RIPK2, TRAF2*) and 11 hypermethylated (*IL6, IL10RB, CCL23, CCL24, CCL28, SQSTM1/MGAT4B, RIPK2, NR2C2, NFKB2*) after dietary intervention.

**Conclusion:** Hypocaloric dietary intervention for six weeks can reduce weight, BMI and fat mass and is able to change the DNA methylation profile of genes related to inflammation in obese women.

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**Disclosure of Interest:** None declared.

#### SUN-LB669

##### REDUCTIONS IN PHYSICAL ACTIVITY ATTENUATE THE RATE OF WEIGHT LOSS DURING DIETARY ENERGY RESTRICTION IN WOMEN WITH OVERWEIGHT AND OBESITY

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**Rationale:** Changes in body composition following energy restriction are highly variable between individuals, but whether compensatory adaptations in biological or behavioural components of total daily energy expenditure (TEE) underlie this variability remains unclear. Therefore, this study examined whether changes in TEE and its components were associated with the rate of weight loss (WL) in women following dietary energy restriction.

**Methods:** 46 women with overweight and obesity (BMI =  $29.1 \pm 2.4$  kg/m<sup>2</sup>) were randomised to continuous (25% energy restriction) or intermittent energy restriction (*ad libitum* day alternated with 75% energy restriction day) until  $\geq 5\%$  WL or up to 12 weeks. At baseline and post-intervention, body composition (air displacement plethysmography), resting metabolic rate (RMR; indirect calorimetry) and 7-day free-living TEE and physical activity (PA; accelerometry) were measured. Rate of WL was defined as percentage of WL divided by days to final measures. Analyses were conducted with dietary groups combined as no pre-post intervention differences in PA or body composition existed.

**Results:** 35 women reached a WL of  $6.0 \pm 1.6\%$  in  $65 \pm 17$  days. There were no associations between changes in RMR and rate of WL ( $r = -0.084$ ;  $p = 0.629$ ). Changes in TEE ( $r = 0.501$ ;  $p = 0.002$ ), total PA ( $r = 0.572$ ;  $p < 0.0001$ ) and MVPA ( $r = 0.574$ ;  $p < 0.0001$ ) were positively associated with rate of WL, while changes in sedentary time were negatively associated with rate of WL ( $r = 0.552$ ;  $p = 0.001$ ).

**Conclusion:** These data suggest that compensatory responses in behavioural rather than biological components of TEE may influence the rate of WL during energy restriction. Changes in PA and sedentary behaviour in response to WL were highly variable between individuals and may in part help account for the heterogeneity seen in dietary-induced WL.

**Trial registration:** NCT03447600.

References: None

**Disclosure of Interest:** None declared.

#### SUN-LB670

##### BRANCHED-CHAIN AMINO ACID AND BRANCHED-CHAIN KETOACID INGESTION INCREASE MUSCLE PROTEIN SYNTHESIS RATES IN VIVO IN OLDER ADULTS

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**Rationale:** Limited data are currently available on the effects of branched-chain amino acids (BCAA) and branched-chain ketoacids (BCKA) ingestion on postprandial muscle protein synthesis rates. This study compared the impact of ingesting 6 g BCAA, 6 g BCKA, and 30 g milk protein (MILK) on myofibrillar protein synthesis rates in older males.

**Methods:** In a parallel design, forty-five older males (age:  $71 \pm 1$  y, BMI:  $25.4 \pm 0.8$  kg/m<sup>2</sup>) were randomly assigned to ingest 6 g BCAA, 6 g BCKA, or 30 g MILK. Basal, early (0–2 h) and late (2–5 h) postprandial myofibrillar protein synthesis rates were assessed by primed continuous L-[ring-<sup>13</sup>C<sub>6</sub>]phenylalanine infusions with the collection of blood samples and muscle biopsies. Data were analyzed using repeated-measures and one-way ANOVA. Data represent means  $\pm$  SEM.

**Results:** Ingestion of MILK, BCAA and BCKA significantly increased early myofibrillar protein synthesis rates (0–2 h) above basal rates (from  $0.020 \pm 0.002\%/h$  to  $0.042 \pm 0.004\%/h$ ,  $0.022 \pm 0.002\%/h$  to  $0.044 \pm 0.004\%/h$  and  $0.023 \pm 0.003\%/h$  to  $0.044 \pm 0.004\%/h$ , respectively;  $P < 0.001$ ), with no differences between groups ( $P > 0.05$ ). Myofibrillar protein synthesis rates during the late postprandial phase (2–5 h) remained elevated in MILK ( $0.039 \pm 0.004\%/h$ ;  $P < 0.001$ ), but returned to baseline values following BCAA and BCKA ingestion ( $0.024 \pm 0.005\%/h$  and  $0.024 \pm 0.005\%/h$ , respectively;  $P > 0.05$ ).

**Conclusion:** Ingestion of 6 g BCAA, 6 g BCKA, and 30 g MILK increases myofibrillar protein synthesis rates during the early postprandial phase (0–2 h) *in vivo* in healthy older males. The postprandial increase following the ingestion of 6 g BCAA and BCKA is short-lived, with higher myofibrillar protein synthesis rates only being maintained following the ingestion of an equivalent amount of intact milk protein.

**References:** n/a

**Disclosure of Interest:** C. Fuchs: None declared, W. Hermans: None declared, A. Holwerda: None declared, J. Smeets: None declared, J. Senden: None declared, J. van Kranenburg: None declared, A. Gijsen: None declared, W. Wodzig: None declared, H. Schierbeek: None declared, L. Verdijk: None declared, L. van Loon Grant/Research Support from: Evonik Industries.

#### SUN-LB671

##### COAGULATION AND DIGESTION CHARACTERISTICS OF MILK PROTEIN MIXTURES

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**Rationale:** Malnourished older adults need high levels of essential amino acids (EAA), including leucine, to stimulate muscle protein

synthesis, but their intake is limited. Oral nutritional supplements can support the protein intake of malnourished people by providing fast-digestible, high-quality proteins. Therefore we aimed to evaluate mixtures of milk proteins on coagulation and digestion.

**Methods:** Coagulation characteristics of milk proteins and mixtures in different ratios were studied in an in vitro stomach digestion model. A mixture (RESANA™, R; casein:whey protein and hydrolysate in 2:1 ratio) was selected for comparison in a randomized, controlled, cross-over trial (ClinicalTrials.gov Identifier: NCT03547362). Post-prandial serum (E)AA profiles were evaluated in 12 healthy older adults (mean age 71.3 ± 4.6 years, 50% male) who consumed 20 g of either casein (C), whey (W), or selected protein mixture (R). The data were statistically analyzed using mixed models, pair-wise compared, and expressed as means ± SEM.

**Results:** In vitro gastric coagulation was shown for casein-rich mixtures, but not for R protein mixture that consisted of two-thirds of casein. Consumption of C, W, and R proteins resulted in different serum AA profiles (all  $p < 0.001$ ) in healthy older participants. Maximum concentrations of total AA and EAA were significantly higher for W and R vs. C (all  $p < 0.001$ ). Maximum leucine concentration was significantly higher for W vs. R vs. C ( $408 \pm 19$  vs.  $304 \pm 13$  vs.  $216 \pm 12$  μmol/L; all  $p < 0.001$ ).

**Conclusion:** The limited gastric coagulation of the R protein mixture may have contributed to the fast and high rise in post-prandial serum AA levels, followed by a sustained delivery. This essential amino acid digestion profile, including leucine, might help malnourished older adults to preserve their muscle mass.

#### Reference

This trial is registered under ClinicalTrials.gov Identifier: NCT03547362.

**Disclosure of Interest:** S. Verlaan Other: Employee of FrieslandCampina, M. Schoemaker Other: Employee of FrieslandCampina, M. van den Belt Grant/Research Support from: Research support from FrieslandCampina, H. van Dijck Other: Employee of FrieslandCampina, J. Schloesser Grant/Research Support from: Research support from FrieslandCampina, A. Kardinaal Grant/Research Support from: Research support from FrieslandCampina.

## Late breaking abstracts 2

### MON-LB672

#### BUDGET IMPACT ANALYSIS OF A HOSPITAL-BASED NUTRITION PROGRAM FOR MALNOURISHED COLOMBIAN PATIENTS

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**Rationale:** Malnutrition affects up to 50% of Colombian inpatients who experience poor health and economic outcomes. Although the optimization of nutrition care through comprehensive nutrition programs for malnourished patients is associated with improved outcomes and cost savings, little is known about the economic advantage of implementing similar programs in Colombian hospitals. We estimated the financial advantages of adopting a comprehensive hospital-based nutrition program for malnourished Colombian patients from a third-party payer perspective.

**Methods:** Budget impact analysis was mainly informed using data from Giraldo et al. (2015) and other secondary data sources. The outcomes of interests included length of stay, 30-day readmissions, and complications (infectious/non-infectious). A Markov model was

developed where patients were assigned to receive nutrition support within 24–48 hours post-hospital admission or continue without nutrition support. The model was set at 60-days time-horizon with a daily cycle length. All event probabilities were estimated assuming a Poisson-like behavior.

**Results:** Average total costs over 60-days were \$3,626 for patients without nutrition support vs \$2,328 for patients with nutrition support; thus, representing a savings of \$1,298 (35.8% decrease) per patient. Differences in costs between the groups were: \$2,600 vs \$1,538 for hospital-associated costs; \$850 vs \$640 for readmissions; and \$170 vs \$91 for malnutrition-related complications, respectively. Total costs savings for Colombia is estimated to be \$1.09 billion.

**Conclusion:** Hospital-based nutrition programs can improve the health outcomes and reduce healthcare costs of malnourished hospitalized patients, whilst helping hospitals in Colombia with healthcare resource management to provide optimal quality of nutrition care to their patients at a reduced overall cost. These results provide a rationale for implementation of comprehensive nutrition programs for the malnourished hospitalized Colombian population.

#### Reference

Giraldo Giraldo NA, et al. Cost-effectiveness of early nutritional therapy in malnourished adult patients in a high complexity hospital. *Nutr Hosp*. 2015;32(6):2938–47.

**Disclosure of Interest:** G. Buitrago: None declared, J. Vargas: None declared, S. Sulo Other: Abbott Employee, J. Partridge Other: Abbott Employee, M. Guevara: None declared, G. Gomez Other: Abbott Employee, J. D. Misas Other: Abbott Employee.

### MON-LB673

#### DIETARY HABITS OF DALMATIAN TYPE 2 DIABETES PATIENTS

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**Rationale:** Previous studies emphasize the importance of good dietary practices in management of diabetes mainly by reducing the body weight as a strong relationship between obesity and the upsurge of diabetes is reported. The objective of the present study was to observe the dietary patterns and food frequencies as well as regular exercise, prevalence of overweight or obesity and correlation of body mass index (BMI) with body mass composition parameters in Dalmatian diabetic patients attending the Nephrology Outpatient Clinic.

**Methods:** 114 diabetic patients 66 (57.9%) men and 48 (42.1%) women were included. Study was an interviewer administered questionnaire based cross-sectional study. Food frequency questionnaire (FFQ) has been used to assess diet in diabetic patients. Also, for each patient data about age, gender, body weight and height were collected and BMI was calculated. Tanita MC780 Multi Frequency segmental body composition analyser was used to measure content of body fat, muscle mass and visceral fat each study subject.

**Results:** Of the study population 54 (47.4%) patients were educated about diabetic diet but just 8 (7%) complained with diet, 23 (20.2%) don't remember when they measured body weight last time and 59 (51.8%) don't have regular physical activity. Of the study population 9 (7.9%) patients consume one meal/day, 91 (79.8%) consume 2–4 meal/day while 14 (12.3%) consume more than four meal/day. Furthermore, 85 (74.6%) patients are adding salt in meals, 26 (23%) patients consumed cured meat products and 98 (86%) consumed bread every day. Also, 79 (69%) patients consumed fruit while 60 (53%) consumed vegetables and 56 (49%) drink milk every day. From the study population, 100 (87.7%) of the patients were either overweight or obese. Those patients with BMI ≥ 25 had significantly higher percentage of fat tissue content (29 (22–36) vs. 17.3 (12.9–25.8),  $p < 0.001$ ) and lower percentage of muscle mass content (68 (60–74) vs. 78.5 (70.6–82.8),  $p < 0.001$ ).

**Conclusion: Results** revealed the importance of educating patients with type 2 diabetes on dietary changes and more importantly the involvement in regular physical activity.

#### Reference

Lifestyle Management: Standards of Medical Care in Diabetes—2019, *American Diabetes Association, Diabetes Care* 2019 Jan; 42 (Supplement 1): S46–S60, <https://doi.org/10.2337/dc19-S005>

**Disclosure of Interest:** None declared.

#### MON-LB674

##### DRACOCEPHALUM MOLDAVICA L. SEED EXTRACTS MODULATE INFLAMMATION AND OXIDATIVE STRESS IN HUMAN SKIN CELLS

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**Rationale:** This study was conducted to investigate its phytosterol contents and antioxidant activity of aqueous (AE) and ethanolic extracts (EE) and supercritical CO<sub>2</sub> extracted oil (SC-oil) of *Dracocephalum moldavica* L. (DM) seed.

**Methods:** Total polyphenol content and total flavonoid content was performed to analyze anti-oxidant capacity of DM seed extracts. For the fatty acid contents in DM seed extracts, GC-FID was used after saponification. Total phytosterols for campesterol, stigmaterol,  $\beta$ -sitosterol + fucosterol, and  $\Delta$ 5-avenasterol were analyzed using GC-FID analysis Human dermal fibroblast and HaCaT cell were used to determine mRNA expression of HAS and Hyaluronidase after sample treatment.

**Results:** Compared to AE and SC-oil, EE showed the highest content of total phytosterols (EE, 963.74; AE, 296.91; SC-oil, 611.30 mg/100 g) in descending order of  $\beta$ -sitosterol + fucosterol, stigmaterol,  $\Delta$ 5-avenasterol and campesterol. In terms of antioxidant activity, EE had the highest radical scavenging capacities of ABTS and DPPH. In lipoxxygenase inhibition assay, AE and EE showed similar inhibition capacity compared to nordihydroguaiaretic acid (NDGA) and SC-oil inhibited more than NDGA. These results indicate that EE and SC-oil showed anti-oxidant and anti-inflammatory activities due to the highest levels of total phytosterols compared to aqueous extract. In human dermal fibroblasts and HaCaT cell lines, UVB decreased hyaluronic acid (HA) concentration via hyaluronic acid synthase 2 inhibition and hyaluronidase 1 induction, which was recovered by SC-oil in dose-dependently manner. SC-oil may protect photoaging by regulating HA concentration at molecular levels in UVB-irradiated human cells.

**Conclusion:** In conclusion, DM may be potentially applied in the area of anti-aging and atopy cosmetics due to its anti-oxidant and anti-inflammatory effects.

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**Disclosure of Interest:** None declared.

#### MON-LB675

##### DRACOCEPHALUM MOLDAVICA L. SEED EXTRACTS AMELIORATE PHOTO-AGING AND WOUND HEALING IN HACAT CELL AND 3D SKIN MODEL

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**Rationale:** *Dracocephalum moldavica* L. (DM) has been used for cardiovascular disease and dermatitis due to antioxidant and antiviral activities. However, few studies on DM and its extracts have been reported. This study was conducted to investigate its wound healing and skin extracellular matrix (ECM) effects in HaCaT cell.

**Methods:** To determine wound healing effect of DM seed extracts, wound healing assay was conducted. After 80–90% of confluence with HaCaT cell in 24 well plate, each well scratched using 200  $\mu$ L tip and treated sample. The wound closure was observed after 24 hours. The 3D skin model which comprise epidermis and dermis was used for the test. Each model was punched using 40 mm of biopunch and after 48 hours of sample treatment, the layers was observed.

**Results:** The wound healing assay was conducted with extracts-aqueous extract (AE), ethanolic extract (EE), and Superfluid critical extract (SC-oil). SC-oil-treated HaCaT cell showed cell closure in dose-dependent manner, whereas AE and EE showed more effective in lower concentrations. However, 0.125 mg/mL, the highest does, of EE showed the highest recovery rate. In 3D culture model, EGF recovered from the wound to 2,468  $\mu$ m. While 3D model treated with AE and EE had no recovery, 3D model treated with SC-oil at 1% and 4% recovered from the wound to 94.6 and to 38.29  $\mu$ m, respectively. SC-oil significantly decreased UVB-induced mRNA level of MMP-1 and AE and EE significantly decreased those levels in dose-dependent manner. SC-oil and AE tended to decrease elastase-1 mRNA expression in UVB-treated HaCaT cell.

**Conclusion:** In conclusion, DM may be potentially applied in the area of cosmetics against photo-aging due to its wound healing and skin ECM protective effects.

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Dastmalchi K., Dorman H.G., Kosar M., Hiltunen R., 2007. Chemical composition and in vitro antioxidant evaluation of a water soluble Moldavian balm (*Dracocephalum moldavica moldavica* L.) extract. *Food Science and Technology* 40, 239–248.

**Disclosure of Interest:** None declared.

#### MON-LB676

##### ECONOMIC EVALUATION OF INDIVIDUALIZED NUTRITIONAL SUPPORT IN MEDICAL INPATIENTS: SECONDARY ANALYSIS OF THE EFFORT TRIAL

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\* Corresponding author.

**Rationale:** Existing guidelines support the importance of nutritional interventions for medical inpatients at malnutrition risk to alleviate the burden malnutrition has on their outcomes. While recent studies reported positive effects of nutritional support on health outcomes, limited evidence exists on whether in-hospital nutritional support also results in economic advantages. We report the results of the economic evaluation of the EFFORT trial.

**Methods:** 2,028 medical inpatients at nutritional risk were randomly assigned to receive individualized nutritional support to reach protein and energy goals (intervention group; n = 1,015) or standard hospital food (control group; n = 1,013). To calculate the economic impact, a



Markov model was developed with relevant health states. Costs were estimated for days in normal hospital ward and Intensive Care Unit (ICU), hospital-associated complications, and nutritional support.

**Results:** In-hospital nutritional intervention cost alone was CHF90 per-patient, while the total nutritional support cost after including dietician consultation time was CHF283,85. In the base-case analysis, 30-day costs averaged CHF29,263 per-patient in the intervention group versus CHF29,477 in the control group; resulting in per-patient cost savings of CHF214 when accounting for nutritional intervention cost only. Per-patient cost savings was CHF19,56 when accounting for total nutritional support cost. The costs savings were mainly due to ICU length of stay (0,19 vs. 0,23 days) and complication (2,11 vs. 2,44) reductions.

**Conclusion:** In-hospital nutritional support for medical inpatients is associated with a cost reduction of up to CHF214 per-patient treated due to reducing the risk for ICU admissions and hospital-associated complications. These findings support the positive clinical and economic benefits for at-risk medical inpatients resulting from comprehensive nutrition programs including malnutrition screening, consultation, and nutritional support. Policies and practices supporting optimization of nutrition care for medical inpatients are critical.

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**Disclosure of Interest:** P. Schuetz: None declared, S. Sulo Other: Abbott Employee, S. Walzer: None declared, L. Vollmer: None declared, Z. Stanga: None declared, F. Gomes: None declared, R. Rueda Other: Abbott Employee, J. Partridge Other: Abbott Employee.

#### MON-LB677

##### EFFECTS OF AU-1803 ON CHOLIC ACID INDUCED-INTESTINAL DAMAGE AND LIVER WEIGHT GAIN IN MICE

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**Rationale:** Cholic acid (CA) is sterol compounds that is synthesized from cholesterol in the liver and secreted into the duodenum as the main compound of bile. During transit to the large intestine, CA undergo modifications to the steroid nucleus by some members of the gut microbiota, yielding deoxy-cholic acid (DCA). DCA have been reported to causes inflammatory bowel lesion and liver damage<sup>1</sup>. Previously we reported that AU1803 treatment suppressed extrinsic CA-derived bowel lesion in mice<sup>2</sup>. In this study, we examined how AU1803 treatment suppressed CA-derived bowel lesion and liver weight gain in mice.

**Methods:** Male ICR mice were acclimated on a control diet for 7 days and then divided randomly into 6 groups. Each group was fed one of 3 diets for 7 days: control diet (control group and CA group), a diet supplemented with 0.3% w/w AU1803 (LAU group and LAU+CA group) and 0.6% w/w AU1803 (HAU group and HAU+CA group). Control group, LAU group and HAU group were fed the same diet for next 28 days. The other groups were fed a diet supplemented 1.2% w/w CA for next 28 days, respectively. Body weight and food intake were measured during the experimental period. The colon and liver weights were measured and used in histological assay.

**Results:** The mean body weight gain of CA group was smaller than that of the other groups during experiment. The ratios of colon weight and length of mice in CA group were significantly greater than the ratio of colon weight and length in CA-untreated mice. Compared with the ratio of colon weight and length in CA group and that of LAU+CA and HAU+CA groups, AU tended to suppress the increase of ratio in colon

weight and length. The mean liver weights of mice in CA treated groups were greater than that of mice in CA-untreated group. There were no significant differences in means of liver weight between CA group and LAU of HAU+CA group.

**Conclusion:** A diet supplemented with AU may suppress DCA-induced inflammatory bowel disease but not liver toxicity in mice.

#### References

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**Disclosure of Interest:** None declared.

#### MON-LB678

##### IMPACT OF PROGNOSTIC NUTRITIONAL INDEX ON OUTCOMES IN PATIENTS WITH MYCOBACTERIUM AVIUM COMPLEX LUNG DISEASE

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**Rationale:** Malnutrition is associated with immune dysfunction and inflammatory processes. It also affects the quality of life and morbidity of patients with pulmonary disease. This study aimed to evaluate whether Onodera's prognostic nutritional index (PNI) is associated with mortality and sputum culture conversion in *Mycobacterium avium* complex lung disease (MAC-LD) patients.

**Methods:** 471 patients diagnosed with MAC-LD between May 2005 and September 2017 were examined. The PNI score was calculated at the time of diagnosis:  $PNI = 10 \times \text{serum albumin (g/dL)} + 0.005 \times \text{total lymphocyte count (/mm}^3\text{)}$ . Patients were divided into the malnutrition and non-malnutrition groups according to the cut-off PNI score of 45. The cut-off PNI score was determined based on studies by Pinato *et al.* Multiple logistic regression models and multivariate Cox proportional hazards models were used to estimate the odds ratio (OR) for sputum culture conversion and the relationship between clinical parameters and mortality, respectively.

**Results:** In the logistic regression model, when age, gender, smoking status, radiographic type, AFB test result, treatment duration, and malnutrition were included, malnutrition (OR: 2.533, 95% confidence interval [CI]: 1.059–6.057,  $P=0.037$ ) was significantly related to culture conversion failure. Cox proportional hazard analysis demonstrated that malnutrition (hazard ratio: 3.711; 95% CI: 2.095–6.574;  $P<0.001$ ), lower BMI, fibrocavitary or unclassifiable radiologic findings, history of cancer, and history of diabetes were significant risk factors for all-cause mortality.

**Conclusion:** Malnutrition is an independent predictor for failure of sputum culture conversion and all-cause mortality in patients with MAC-LD. It is important to stress the importance of nutritional assessment for patients with MAC-LD.

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- Pinato DJ, North BV, Sharma R. A novel, externally validated inflammation-based prognostic algorithm in hepatocellular carcinoma: the prognostic nutritional index (PNI). *British journal of cancer*. 2012;106(8):1439–1445.

**Disclosure of Interest:** None declared.

**MON-LB679****MINI NUTRITIONAL ASSESSMENT SHORT FORM AND KIHON CHECKLIST ARE SIMPLE AND USEFUL SCREENING FOR CARDIAC CACHEXIA IN OUTPATIENTS WITH HEART FAILURE**

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**Rationale:** Cardiac cachexia is a poor prognosis and diagnosis is important. However, diagnosis of cardiac cachexia for outpatients is not sufficiently performed because it may be time-consuming. We investigated screening methods useful for the diagnosis of cardiac cachexia in the clinical setting.

**Methods:** Totally 118 outpatients with CHF aged over 65 years old were enrolled. The criteria for evaluating cachexia by Evans were used. Nutritional status was assessed by the Mini Nutritional Assessment Short Form (MNA<sup>®</sup>-SF) and frailty was assessed by the 'Kihon checklist'. We compared and evaluated these assessments and the diagnosis of cachexia.

**Results:** The mean age was 76.0 ± 7.4 years old and left ventricular ejection fraction was 43.6 ± 17.2%. Of the study patients, 54.7% patients were male, 20.7% patients had ischemic heart failure, 45.9% patients had MNA<sup>®</sup>-SF score ≤ 11, and 14.4% patients had cardiac cachexia. The 1-year event-free survival rates were cardiac cachexia group 64.7% and non-cardiac cachexia group 88.5% (Log-rank,  $p < 0.01$ ). The multivariate logistic regression analysis suggested that MNA<sup>®</sup>-SF score {odds ratio (OR), 0.51; 95% confidence interval (CI), 0.36–0.66;  $p < 0.01$ } and Kihon checklist score (OR, 1.35; 95% CI, 1.19–1.59;  $p < 0.01$ ) might be independent predictors for cardiac cachexia in heart failure patients.

**Conclusion:** Evaluation by MNA<sup>®</sup>-SF and Kihon checklist score was simply performed by questions, which were useful for diagnosing cachexia.

**Reference**

Satake S, et al. Validity of the Kihon Checklist for assessing frailty status. *Geriatr Gerontol Int*. 2016 Jun;16(6):709–15.

**Disclosure of Interest:** None declared.

**MON-LB680****NUTRITIONAL STATUS IN ADULTS WITH CYSTIC FIBROSIS AND PANCREATIC INSUFFICIENCY**

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**Rationale:** Cystic fibrosis (CF) with pancreatic insufficiency (PI) need pancreatic enzyme and vitamin supplements to prevent malnutrition due to malabsorption of macro- and micronutrients. Few studies have been evaluating nutritional status in patients with CF and PI. The aim of the study was to assess nutritional status in adult CF with PI.

**Methods:** A cross-sectional pilot study, was carried out in adult patients at the Department of Pulmonary Medicine at Oslo University Hospital (OUH) from August to December 2018. Patients with liver

disease were excluded. Nutritional status was assessed by anthropometric measurements (including weight, height, body mass index (BMI)), handgrip strength (HGS) and body composition analysis using dual energy X-ray absorptiometry (DXA). Spirometry and biochemical measurements were also measured. A 24 hours diet recall, in three separate days, was used to assess the participants' dietary intake.

**Results:** 34 participants were included. Mean BMI was 24.0 kg/m<sup>2</sup> for all the subjects, where 61.5% of female subjects had BMI below 22 kg/m<sup>2</sup> and 42.9% of the male subjects had BMI below 23 kg/m<sup>2</sup>. 11.1% (3/27) of the subjects had osteopenia. A significant but moderate correlation ( $r = 0.51$ ;  $p = 0.008$ ) of body mineral density (BMD) with handgrip strength (HGS) was found. There were significant but moderate correlations of lean body mass (LBM) with BMD ( $r = 0.62$ ;  $p < 0.001$ ), lean body mass index (LBMI) with HGS ( $r = 0.67$ ;  $p < 0.001$ ), and LBMI with FEV1% ( $r = 0.39$ ;  $p = 0.04$ ). 32% (8/25), 4.2% (1/24) and 12.5% (3/24) of the subjects, respectively, had deficiency in vitamin (vit) D, A and E. 3.4% (1/29) of the subjects were iron anemia deficient. Median (IQR) intake of energy was 82 (65.2–104.8) % EAR (estimated average requirements), min-max (43.2–178.3) compared to recommendations specific for CF which is 120–150% of EAR.

**Conclusion:** A high prevalence of subjects with low intake of energy was found. Fat-soluble vitamins status was not optimal, despite using vitamin supplementation and pancreatic enzymes. BMD and LBM seem to correlate with peripheral muscle strength and lung function.

**Reference**

Baker Robert D, Coburn-Miller Chris, Baker Susan S. Cystic fibrosis: Nutritional issues. Literature review current through: Apr 2019. | This topic last updated: Jan 21, 2019.

**Disclosure of Interest:** None declared.

**MON-LB681****PREVENTION OF NUTRITIONAL DEFICIENCIES IN CHRONIC HEPATITIS C PATIENTS- NEW VIRUS REMOVAL TREATMENT-**

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**Rationale:** The number of hepatitis C virus (HCV) infection patients exist about 200 million people in the world. Chronic hepatitis C patients with advanced fibrosis may develop nutritional deficiencies and muscle weakness. The virus removal has shown nutrition improvement and the suppression of bone fractures [1]. Currently, the effective virus removal treatment is only interferon combination therapy. The purpose of this study was development of new virus removal treatment. We suggested the filter which specifically absorbed HCV and examine of HCV removal rate.

**Methods:** We separated the mononuclear leukocyte layer from the HCV infection blood of three cooperators, and immunostained them using the monoclonal HCV antibody. In addition, we examined the filter material which specifically absorbed HCV using 14 HCV infection patients. We tried appearance coating of hydroxypropyl cellulose (HPC), which was hydrophilic polymer, and cellulose acetate (CA) in syndiotactic polystyrene (SPS) resin. SPS resin which is the material of leukocyte removal filter used as blood transfusion filter disturbs removal of leukocyte ingredient [2]. The filters of fiber diameter were 1.8 μm and 3.5 μm. We performed perfusion of blood to each filter, and measured the blood count before and after the experiment.

**Results:** Firstly, HCV positive cells were confirmed with three cases. Mononuclear leukocyte might phagocytose HCV antigen. Secondly, the removal efficiency of blood cells with SPS-HPC of 3.5 μm were higher than other filters. Finally, the removal rates of HCV in the whole blood, plasma and the mononuclear leukocytes significantly decreased 59.2%, 57.0% and 77.2%, respectively.

**Conclusion:** The mononuclear cells which infected HCV might be carried to other organs as well as liver. We confirmed that most HCV virus and mononuclear cell with HCV were absorbed by SPS-HPC. We suggested that the SPS-HPC prevent from nutritional deficiencies as a result of suppressing the development of chronic hepatitis.

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**Disclosure of Interest:** None declared.

#### MON-LB682

##### PROTEIN AND ENERGY INTAKE DURING HEMODIALYSIS TREATMENT

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**Rationale:** Eating during hemodialysis (HD) improves nutritional status, clinical outcomes, quality of life and reduces mortality. There is controversy in providing food during HD, because this could lead to symptomatic hypotensive events (SHE's) [1]. Radboud University Medical Centre introduced a new food service (NFS) to the dialysis department, which contains several small protein-rich foods and adheres to the Dutch dietary HD guidelines. Objectives were to investigate whether NFS improves protein and energy intake during HD, compared to the old food service (OFS) and evaluate the number of SHE's between food services in HD patients.

**Methods:** A prospective cohort design was used with 25 HD outpatients (mean HD duration 4 hours). Intake and SHE were measured three days within one week during OFS and three days six months later during NFS. SHE was defined as a systolic drop >20 mmHg between two blood pressure measurements and 1) temporary or permanent fluid removal stop or 2) nausea or 3) dizziness. Intake differences between food services was analysed with linear mixed models and corrected for fluid removal.

**Results:** Protein and energy intake over the three measurements within each food service was fairly constant. Mean  $\pm$  SD protein intakes for OFS and NFS were 26  $\pm$  11 and 31  $\pm$  13 grams, energy intakes were 603  $\pm$  218 and 724  $\pm$  244 kcal. For fluid removal adjusted differences between OFS and NFS were significant, in favour of NFS (protein:  $\beta$  3.2, 95%CI 0.2–6.1; energy:  $\beta$  105.8, 95%CI 46.4–165.2). No increase in SHE's occurred at NFS (2 SHE's at OFS vs. 1 SHE at NFS).

**Conclusion:** NFS resulted in an increased protein and energy intake, while no increase in SHE was observed.

#### Reference

1. Kistler BM *et al.* *J Ren Nutr.* 2018;28:4–12.

**Disclosure of Interest:** None declared.

#### MON-LB683

##### REAL-WORLD EVIDENCE OF CLINICAL CHARACTERISTICS AND TOLERANCE OUTCOMES AMONG ADULT POST-ACUTE CARE PATIENTS RECEIVING PEPTIDE-BASED DIETS IN THE US

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**Rationale:** Enteral tube feeding (ETF) is a medical nutrition therapy used to help meet nutritional requirements in patients who have inadequate volitional intake. Inadequate delivery of ETF may be secondary to enteral formula intolerance, leading to malassimilation of nutrients. Our aim is to assess the real-world tolerance of enteral peptide-based diets (PBDs) in adults outside of the hospital in a post-acute care setting.

**Methods:** Medical claims data were obtained from the Decision Resources Group Real World Evidence Data Repository US database. The cohort of adult patients (>18 years old) included patients receiving PBDs through ETF for any condition after hospital discharge between Q1-2013 and Q4-2017. Patients were observed up to 1-year post-initiation of PBDs after hospital discharge. Univariate descriptive statistics, including means, standard deviations, and proportions were calculated for study variables.

**Results:** Mean age of the 2,256 included patients was 53.1 (SD 18.1) years and 47.8% were female. The most commonly observed underlying conditions were relative to the digestive system, endocrine nutritional and metabolic diseases, and diseases of the respiratory system. Use of PBDs is associated with a reduction in nausea and vomiting, 26.3% vs 15.1% ( $p < 0.001$ ); diarrhea, 25.4% vs 16.9% ( $p < 0.001$ ); constipation 28.5% vs 18.9% ( $p < 0.001$ ); abdominal distension, 12.8% vs 7.3% ( $p < 0.001$ ); and gastric residual, 8.1% vs 4.2% ( $p < 0.001$ );  $\geq 2$  adverse tolerance events, 28.6% vs 16.2% ( $p < 0.001$ ). No significant change in weight, BMI, or HbA1c was observed. In the 30 days post initiation of PBDs, 46.2% of patients had >1 inpatient visit (mean 3.6, SD 4.1). In the same period, 99.8% of patients had >1 outpatient visit recorded (mean 5.0 SD 3.4).

**Conclusion:** This study shows that enteral feeding with PBDs leads to a significant improvement in gastrointestinal tolerance events.

#### Reference

Decision Resources Group Real World Evidence Data Repository US Database.

**Disclosure of Interest:** C. Lowen Other: Employee of NHS, C. Lavalley Consultant for: NHS, P. Seelam Consultant for: NHS, S. Balakrishnan Consultant for: NHS, A. Henrikson Other: Employee of NHS, B. Kesting Other: Employee of NHS, K. Araujo Torres Other: Employee of NHS.

#### MON-LB684

##### THE EFFECT OF TWO IN-HOSPITAL MEAL SERVICES ON PROTEIN AND ENERGY INTAKE IN ELDERLY

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**Rationale:** All hospitalized elderly patients have higher protein needs, regardless of their former nutritional status. The aim of this study was to investigate the effect of two new in-hospital meal services in Bernhoven on protein (and energy) intake of elderly.

**Methods:** Patients of the current meal service (A) ( $n = 32$ ) received an energy and protein enriched diet only when they were at risk for malnutrition. During the second meal service (B) ( $n = 36$ ), ALL patients received one oral nutritional supplement extra (400 kcal, 20 g protein). During the third meal service (C) ( $n = 35$ ), ALL patients were offered an protein and energy enriched diet. Protein and energy intake were calculated by having write down as accurately as possible what has been eaten and drunk on the fourth recording day. Protein and energy requirements were calculated by using formulas. Both new meal services (B and C) were compared to the current meal service (A).

**Results:** As can be seen in Table 1, meal service C significantly improved protein intake in % of requirements, compared to the current meal service (A). Using meal service C, significantly more patients met 100% of their protein requirement (46% vs 19%,  $p < 0.05$ ) compared to



meal service A. Using meal service B this difference was also observed (33% vs 19%,  $p = 0.174$ ), although not significantly different.

**Table 1**  
Protein and energy intake in percentage of calculated requirements

Meal service	A	B	C
Protein, % of requirements*	64(52–95)	87(69–107)	98(76–114) <sup>a</sup>
Energy, % of requirements*	86 ± 31	93 ± 29	96 ± 22

\*Mean ± SD for metric variables and median and (IQR) for non-metric variables

<sup>a</sup>Statistically significant difference  $P < 0.05$ .

**Conclusion:** We have shown to improve protein intake in our elderly patients, by adjusting our standard meal service. Use of one additional oral nutritional supplement a day showed a trend towards higher protein intake, but was not significant.

#### Reference

Bauer J, Biolo G, Cederholm T, Cesari M, *et al.* Evidence-based recommendations for optimal dietary protein intake in older people: a position paper from the PROT-AGE Study Group. *J Am Med Dir Assoc.* 2013;542–59.

**Disclosure of Interest:** None declared.

#### MON-LB685

##### TRANSITION BETWEEN NUTRITION CATEGORIES IN HEMODIALYSIS PATIENTS, 1 YEAR FOLLOW UP STUDY

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**Rationale:** We have previously characterized four nutritional categories in hemodialysis (HD) patients, by the method of ICNDS (Integrative Clinical Nutrition Dialysis Score) and slope of three subsequent monthly scores. Four categories emerged as predictors of survival. This study aims to explore transition between nutrition categories from HD initiation up to 12 months.

**Table 1**  
Transition between nutrition categories from HD initiation up to 12 months follow up.

	Categories following 1 year HD, percent patients	Categories following 1 year HD, percent patients				Mortality
		Category 1	Category 2	Category 3	Category 4	
Categories at HD initiation, percent patients (N = 226)	Category 1 (N = 81)	39.5	22.2	8.6	2.5	27.2
	Category 2 (N = 79)	34.1	24.1	2.5	1.3	38
	Category 3 (N = 52)	23.1	25	9.6	0	42.3
	Category 4 (N = 14)	28.6	21.4	14.3	0	35.7

**Methods:** In 226 HD patients initiated dialysis, nutrition status was monthly evaluated by ICNDS, a method based on seven parameters (albumin, creatinine, urea, cholesterol, Kt/V, CRP, post dialysis weight change). We calculated slope of first three subsequent monthly scores of each patient at HD commencement and 12 months later. Patients were divided into four categories: Category 1: score  $\geq 75$  slope  $\geq 0$ ; Category 2: score  $\geq 75$  slope  $< 0$ ; Category 3: score  $< 75$  slope  $> 0$ ; category 4: score  $< 75$  slope  $< 0$ . We have explored transition between nutrition categories following 1 year in HD.

**Results:** Majority of patients evaluated at HD commencement as category 1 remained in the same category following 12 months in dialysis. Patients at category 1 at HD commencement had reduced mortality risk compared to other categories. Probability to improve nutrition status of patients evaluated as category 2,3 and 4 at initiation of HD was higher than probability to stay at the same category.

**Conclusion:** Although nutrition status at HD commencement is a main prognostic factor, transition between nutrition categories following first year in HD might improve survival as well as nutrition status.

#### Reference

Blumberg Benyamini S *et al.* *Journal of Renal Nutrition*, Vol 24 (6) 2014: pp. 401–410.

**Disclosure of Interest:** None declared.

#### MON-LB686

##### A UK ONLINE SURVEY TO ASSESS THE USE OF A MULTIDISCIPLINARY TOOL TO AID MANAGEMENT OF GASTROINTESTINAL SYMPTOMS IN ENTERALLY FED PATIENTS WITH NEUROLOGICAL CONDITIONS

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**Rationale:** There is currently no consensus definition of “enteral feeding intolerance”.<sup>1,2</sup> Clinical manifestations may include: nausea, vomiting or regurgitation, diarrhoea, abdominal pain, abdominal distension, high gastric residual volumes<sup>1–3</sup>. To help guide clinical practice, a working group of specialist dietitians and a consultant neuro-gastroenterologist met with the aim of developing a pragmatic guidance tool.

**Methods:** During March and April 2019, an online survey was sent to; Neurosciences Group (NSG) and the Parenteral and Enteral Nutrition Group (PENG) of the British Dietetic Association (BDA). The purpose was to understand; (a) What has been the current uptake of the tool amongst dietitians (b) To gather insights on the potential use of the tool amongst dietitians and other Health Care Professionals (HCP’s).

**Results:** The survey was completed by 65 members, 68% had seen the tool, 32% had not. Since its launch 36% have used the tool and 20% using it on a monthly basis. Areas in the tool most useful were; nausea/vomiting (71%), abdominal pain/bloating (65%), constipation (62%), diarrhoea (56%), reflux (44%), epigastric pain (35%) and early satiety (29%). Reasons for this were; “these were common symptoms experienced by patients”, “difficultly determining the cause of these symptoms” and “allowing dietitians to consider alternative routes before making changes”. Ninety one percent felt the tool can be used in acute and community settings. The majority were extremely likely or likely to use the tool. Sixty eight percent believe it can improve quality of life for patients. Between 85–91% would recommend the tool to other HCP’s and use at their next visit. Members believe the tool could be used by; dietitians with limited experience in neurological conditions (88%), student dietitians (88%), specialist neurology nurses (70%), GPs (65%), junior doctors/registrar (62%), gastroenterology nurses (53%), neurologists (53%), gastroenterologists (50%) and ward nurses (47%).

**Conclusion:** The response to the tool has been very positive, described as fantastic, user-friendly and practical. Next steps include additional data collection in its use in clinical practice.

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**Disclosure of Interest:** S. Saduera Other: Survey funded by Nestlé Health Science UK.

**MON-LB687****BOTH MALNUTRITION AND FRAILITY, AND MALNUTRITION AND SARCOPENIA OVERLAP SUBSTANTIALLY IN HOSPITALIZED OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS**

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**Rationale:** A previous meta-analysis revealed a prevalence of 19% frailty and 2.3% malnutrition in community-dwelling older adults (1). Of those with malnutrition, 68% were also frail, whereas only 8.4% of frail older people were also malnourished. A new meta-analysis in hospitalised older adults examining the overlap in prevalence of (risk of) malnutrition and (pre-)frailty, and the overlap in prevalence of (risk of) malnutrition and sarcopenia has been undertaken. Preliminary data are presented.

**Methods:** A systematic literature search resulted in a selection of 29 papers on (risk of) malnutrition and frailty and 20 papers on (risk of) malnutrition and sarcopenia. Available data were used to report the overall and overlapping prevalence of (risk of) malnutrition and (pre-) frailty, and prevalence of (risk of) malnutrition and sarcopenia. The association between (risk of) malnutrition and (pre-)frailty or sarcopenia was determined with Odds ratios.

**Results:** Pooled data revealed that 67% [95% CI: 59, 74%] of older, hospitalized adults were (at risk of being) malnourished, 82% [95% CI: 75, 90%] were (pre-)frail and 37% [95% CI: 26, 48%] had sarcopenia. Furthermore, a high overlapping prevalence and concomitant Odds Ratio was observed for (risk of) malnutrition and (pre-)frailty (50%; OR: 5.24 [95% CI: 3.58, 7.67]) and for (risk of) malnutrition and sarcopenia (42%; 4.06 [95% CI: 2.16, 6.80]). Also, 89% and 55% of those with (risk of) malnutrition were frail or sarcopenic, respectively, and 61% of the frail and 89% of those with sarcopenia were (at risk of being) malnourished.

**Conclusion:** The prevalence and overlap of (risk of) malnutrition and (pre-)frailty or sarcopenia in hospitalized older adults was observed to be substantial, indicating that most older adults suffer from two and perhaps even three of these geriatric syndromes. This supports the importance of screening for these syndromes before or at hospital admission to guide intervention and nutritional support.

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**Disclosure of Interest:** None declared.

**MON-LB688****NECK CIRCUMFERENCE IS INDEPENDENTLY ASSOCIATED WITH OBESITY IN FEMALE EMIRATI STUDENTS**

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**Rationale:** Neck circumference is a new tool that has been linked to obesity. However, no studies in UAE have been conducted yet. The purpose of this study was to measure the obesity levels in a college

population and to correlate them with NC and other anthropometrical indexes.

**Methods:** Three hundred and fifty-five female students aged 18–24 were conveniently selected to participate in the study. Anthropometrical indexes were obtained from all subjects after 12-h fasting. NC was measured with a regular plastic tape to the nearest 0.5 mm. Statistical significance was considered for  $P < 0.05$ .

**Results:** Eighty-five out of 355 female college students (23.9%) were overweight (OW) and obese (OB). The OW/OB group had significantly important higher levels ( $p < 0.001$ ) of waist Circumference (WC), Free fatty mass (FFM) and neck circumference (NC),  $P < 0.021$  compared to the normal group. In Pearson Correlation, NC ( $r = 0.881$ ), WC ( $r = 0.712$ ) and BF ( $r = 0.732$ ) were significantly ( $P < 0.001$ ) strongly positively correlated with obesity. In multiple regression analysis, NC (Beta: 2.12; 0.85, 2.32) and WC (Beta: 1.21; 0.77, 1.98) were significantly ( $P < 0.001$ ) independently associated with obesity.

**Conclusion:** Neck circumference is a new tool that may be used safely to measure neck fatness levels. In addition, NC was found to be independently associated with obesity levels in Emirati college students. More extended studies including data from all Emirates are necessary for the development of cut off references and the possible associations with CV risk factors that may lead to health problems for obese people later in their life.

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**Disclosure of Interest:** None declared.

**MON-LB689****PREVALENCE OF HOSPITAL MALNUTRITION AND DURATION OF HOSPITALIZATION IN A SECOND LEVEL HOSPITAL**

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**Rationale:** Hospital malnutrition is associated with greater risk of morbidity and mortality. The aim of the study was to determine the prevalence of nutritional risk in patients hospitalised in a second level hospital in Spain.

**Methods:** Cross-sectional, observational study in a period of 5 consecutive days, assessing the prevalence of malnutrition at patient admission using Malnutrition Universal Screening Tool (MUST). Exclusion criteria were patients <18 years old, pregnancy and ICU. For statistical analysis SPSS v20 was used

**Results:** 111 patients were included, 53.8% males, mean age 67.1 years (SD 18). 51.4% were >70 years. Mean BMI 27.07 Kg/m<sup>2</sup> (SD 5.1). Using MUST the prevalence of malnutrition was 28.8% (13.5% medium risk and 15.5% high risk). Mean duration of hospitalization were greater in patients at high risk (9 days, 95% confidence interval (CI) 4.3–13.7), than in low and medium risk patients (5.9 days, 95% CI 4.7–7.2),  $p < 0.009$ . 25.3% of patients at high risk died during the 30 days posthospitalization, comparing to 10% of patients in the other groups ( $p < 0.001$ ). Only 1.8% of all (2 patients) received a nutritional support at admission.

**Conclusion:** This study shows that hospital malnutrition is a prevalent condition in hospitalized patients that is associated with longer hospital stays and double risk of death. Nutritional support strategies are needed at admission.

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**Disclosure of Interest:** None declared.

## MON-LB690

### RISK OF DISEASE-RELATED MALNUTRITION IN GASTROENTEROLOGY OUTPATIENTS

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**Rationale:** Disease-related malnutrition (DRM) in hospitalized patients is known to have significant negative impact on clinical outcomes. Meanwhile, DRM in gastroenterology outpatients is vaguely investigated. The aim of this study was to investigate the prevalence of unintentional weight loss (UWL) and reduced food intake (RFI) as contributors for the risk of DRM in outpatients.

**Methods:** All outpatients visiting the department of Gastroenterology, Aalborg University Hospital, Denmark, for any reason, during one week in September 2018 were invited to participate. Data regarding UWL within the past three months, RFI the past week, nutritional impact symptoms (NIS) and demographics were collected in this questionnaire-based cross-sectional study. Descriptive analysis, chi-squared test and multiple logistic regression analysis were used for statistics.

**Results:** Out of 348 eligible patients, 346 were included; medical clinic (n = 170) and surgical clinic (n = 176). UWL occurred in 26%, mean weight loss 7.1 kg (SD 5.2) and 24% had RFI. A significant increased risk of UWL was identified in patients with BMI <18.5 kg/m<sup>2</sup> (OR 6.1, CI: 2.0–18.7, p = 0.003). NIS were more frequent in the medical clinic. The main self-reported reasons for NIS affecting UWL were lack of appetite (15% vs. 12%), pain (14% vs. 8%) and nausea (12% vs. 3%).

**Conclusion:** One in four outpatients experienced UWL and/or RFI as contributors to the risk of DRM, which may have a significant negative impact on clinical outcome. Follow-up studies are needed for further investigation of UWL and RFI as contributing factors for DRM, the impact on clinical outcome and of nutritional intervention in outpatients.

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**Disclosure of Interest:** None declared.

## MON-LB691

### ASSESSING MALNUTRITION RISK PREVALENCE AND PROFILES OF ADULT HOSPITALIZED PATIENTS IN MEXICO CITY

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**Rationale:** Malnutrition poses a significant burden on patients' nutrition, clinical and health outcomes and results in increased costs as a result of higher healthcare use. We assessed malnutrition risk prevalence and characteristics of hospitalized adults receiving care at a tertiary hospital in Mexico City.

**Methods:** Malnutrition risk was assessed by the nutriologist in non-critical areas during the first 24 hours of admission using NRS-2002. Main characteristics included age, gender, body mass index (BMI), weight changes during hospital stay, food intake, nutrition support. Length of hospital stay, and healthcare use 30-days post hospital discharge were also recorded. Results are reported for qualifying patients had complete data per questionnaires required by nutritionDay 2015.

**Results:** A total of 146 patients were included, malnutrition risk was 61%. Patients were 52 y, predominantly male (59%), and underweight (BMI = 24.6 ± 5.9). Of the total patients, 70.5% reported weight loss, with 28.8% of the patients losing >8 kg; main reasons for decreased food intake were inability to eat due to medical tests, loss of appetite, and other. In terms of nutrition support, 39% of the patients were on therapeutic diet, 34.9% of regular diet, 8.22% on oral nutritional supplements, and the remaining patients on parenteral or enteral nutrition. The average length of stay was 11 [range:2–92] and 79.5% of the patients were successfully discharged home independently. Over 6% of the patients died, while less than 1% of the patients were readmission 30-days post hospital discharge.

**Conclusion:** Malnutrition risk was higher among patients 52 years with low BMI, thus leading to longer hospital stay. The results emphasize the need for systematic nutrition screening and treatment protocols to ensure hospitalized patients can experience improved nutrition and health outcomes.

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**Disclosure of Interest:** None declared.

## MON-LB692

### DIET QUALITY IN LATE MIDLIFE IS ASSOCIATED WITH FASTER WALKING SPEED IN LATER LIFE IN WOMEN, BUT NOT MEN: FINDINGS FROM A BRITISH BIRTH COHORT

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**Rationale:** Healthy diet has been linked to better physical functioning while ageing, but evidence on the prospective relationship of overall diet quality in late midlife and walking speed in later life is limited. Research on potential sex differences in this relationship is scarce.

**Methods:** This study investigated the association between overall diet quality, as assessed by the Healthy Eating Index-2015 at age 60–64 y, and measures of walking speed seven years later, among men and women from the Insight 46, a neuroscience sub-study of the Medical Research Council National Survey of Health and Development. Diet was assessed at age 60–64 y using five-day food diaries, from which total HEI-2015 was calculated. At age 69–71 y, walking speed was estimated during a four 10-meter walk at self-selected pace, using an inertial measurement unit. Multivariable linear regression models with sex as modifier, controlling for age, follow-up, lifestyle, health



and social variables and physical performance were used. The final sample was 164 women and 167 men (n = 331).

**Results:** On average, women had higher HEI-2015 scores at age 60–64 y and slower walking speed than men at age 69–71 y. A 10 point increase in HEI-2015 was associated with faster walking speed seven years later among women (B:0.024, 95% CI:0.006,043), but not men. The association remained significant in the multivariable model (B:0.021, 95% CI:0.003,040).

**Conclusion:** In women in late midlife, but not men, higher diet quality is associated with better physical capability in later life.

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**Disclosure of Interest:** None declared.

#### MON-LB693

##### MANAGEMENT OF HYPONATREMIA IN PATIENTS WITH TOTAL ENTERAL TUBE FEEDING (TEN), ARE WE DOING IT RIGHT?

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**Rationale:** The appropriate treatment of non-severe hyponatremia according to the clinical guidelines should be fluid restriction-FR (<1 liter) in euvolemic patients, furosemide in hypervolemic and isotonic saline (IS) in hypovolemic. The aim of this study was to know the current management of hyponatremia in patients with TEN.

**Methods:** An observational, prospective study during 24 months. The study was designed in non-critically hyponatremic patients receiving TEN and presenting hyponatremia. Data collected included sex, age, clinical volemia, type of treatment (FR, furosemide, IS) and serum sodium levels before and 72 hours after started treatment. Total volume of fluid (TEN and addition non-TEN iv fluids) were also included before and during hyponatremia treatment.

**Results:** 29 patients were included. 58.9% males, age 76 (IR 68–84) years. 3.4% were hypovolemic, 89.6% were euvolemic and 6.9% were hypervolemic. All of them received treatment and was appropriate treatment in 100% hypovolemic, 65.3% euvolemic and 50% hypervolemic patients. Eunatremia (Serum sodium >135 mmol/L) was reached by 48.3%: 50% of hypervolemic and 54.1% of euvolemic patients; eunatremia was not reached in hypovolemic patients. We found eunatremia in 64.3% patients with adequate treatment and in 35.7% without adequate treatment (p = 0.555). In euvolemic patients total volume during hyponatremia management was 1800 (IR 1600–2200) mL: 1200 (IR 1000–1332) mL of TEN and 800 (IR 600–800) mL of non-TEN iv.

**Conclusion:** Eunatremia was more frequent in patients with appropriate treatment. However, in euvolemic patients with hyponatremia it is difficult to establish the appropriate treatment. In these patients, the fluid restriction to less than 1 liter is not possible.

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**Disclosure of Interest:** None declared.

#### MON-LB694

##### PREVALENCE OF MALNUTRITION IN SEDRENO STUDY ACCORDING TO GLIM CRITERIA

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**Rationale:** In a previous study conducted in Spain (PREdyCES 2009) the prevalence of malnutrition was 23.7%. The main objective of the SeDREno study was to check the prevalence of hospital malnutrition at admission, according to GLIM criteria, ten years later.

**Methods:** the study was conducted in 5 communities of the north of Spain, in a period of 5–7 days (SeDREno: DRE north week). Cross-sectional, observational, multicentre study in routine clinical practice, which assessed the prevalence of hospital malnutrition at patient admission using GLIM criteria.

**Results:** 2185 patients, 54.8% males, mean aged 67.1 ± 17 years (50.2% were ≥70 years), mean BMI 26.9 ± 5.6 kg/m<sup>2</sup>. Malnutrition was observed in 29.7% of patients according to GLIM criteria (12.5% severe and 17.2% moderate). In patients ≥70 years malnutrition was observed in 34.8% (14.7% severe and 20.1% moderate)(p < 0.001). Multivariate analysis revealed that age, gender, weight, BMI and polymedication were the main factors associated with the presence of malnutrition (p < 0.001). It was observed a significantly greater nutritional risk for women with respect to men (p = 0.048), and those admitted as emergencies and to medical department (p < 0.001). Clinical conditions significantly associated at admission with a higher prevalence of malnutrition were dysphagia (47.6% p < 0.001), cognitive impairment (43.4% p < 0.001), cancer (39.1% p < 0.001), digestive pathology (37.7% p < 0.001), diabetes (34.8% p < 0.004) and cardiovascular disease (33.4% p < 0.004). Malnutrition was associated with an increase in length of hospital stay and death (p < 0.001).

**Conclusion:** In SeDREno study, almost one in three patients are malnourished. In patients admitted, with acute or chronic pathology, it is only necessary to detect a phenotypic criterion to meet GLIM criteria. In patients ≥70 years, the presumption of malnutrition must be admitted to implementing early detection and treatment measures.

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**Disclosure of Interest:** The authors thank Abbott Nutrition the technical support provided to develop the study.

### MON-LB695 COMPARISON OF TOLERANCE CONTINUOUS AND INTERMITTENT ENTERAL FEEDING IN PATIENTS AFTER CARDIAC ARREST

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**Rationale:** There are many reaserch comparing different methods of enteral nutrition in patients on Intensive Care Units. However there is no enough data about nutrition in patients after sudden cardiac arrest. The aim of this study was to compare two methods of enteral nutrition intermittent and continuous in terms tolerance in patients after cardiac arrest.

**Methods:** Retrospective analysis of medical records for 40 patients Intensive Care Unit in 2017–2019. 20 patients were analyzed in each specific method of nutrition. They were fed at least 5 days of industrial diet and dosing through the nasogastric tube. In the case of the continuous method, patients were infused continuously for 20 hours a day. If the intermittent method is used up to 5 bolus for 2 hours with a 6-hour night break. Tolerances of both forms were analyzed.

**Results:** The characteristics of the two groups were similar. Enteral nutrition was implemented on average 44 ± 21.9 hours. There were no differences in the level of biochemical parameters and glycemia between these groups. Vomiting occurred in almost 35% of patients, with no differences between the groups. The analysis showed a significant decrease in diarrhea in patients after the intermittent method compared with continuous administration (OR 0.167, 95% CI [0.03–0.0], p = 0.029).

**Conclusion:** In patients after sudden cardiac arrest, the method of intermittent enteral nutrition appears to be better tolerated than the continuous method by reducing diarrhea. There were no differences in other aspects, such as infection, decubitus ulcers, biochemical or glycemic tests.

#### Reference

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**Disclosure of Interest:** None declared.

### MON-LB696 MODULATION OF INTESTINAL HEALTH BY FOOD INGREDIENTS; TAKING UP THE CHALLENGE FOR HEALTH BENEFIT SUBSTANTIATION

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**Rationale:** Gut microbial colonization in early life runs in parallel with immune system maturation and plays a role in intestinal physiology and regulation. Aging on the other hand leads to alterations in gut microbial diversity, immunity and metabolism resulting in an increased susceptibility to infections and disease. Studies indicate that nutrition, including pre-, pro- and synbiotics, plays an important role in development and maintenance of a balanced gut environment. **Methods:** The present study describes an extensive “Gut Health Discovery Platform (GHDP)” studying 3 main factors contributing to

gut health: (1.) The microbiome, including assays on anaerobic culturing, 16s sequencing, shotgun metagenomic and metabolite analysis, (2.) The intestinal epithelial cells, including assays on anti-adhesion, barrier integrity, barrier enforcement and chemokine/cytokine profiling, (3.) The immune cells, including assays on immune responsiveness and cytokine profiling. The effects of a range of new oligosaccharides (OS) were studied in a part of the GHDP followed by integrative analysis.

**Results:** In the microcolon model, using infant faces as inoculum, specific OS inhibited, stimulated or were ineffective in modulating Bifidobacteria growth. Intestinal cell assays showed a differential capability for each of the tested OS in inhibiting *E. coli* adhesion and *E. coli* induced intestinal barrier disruption.

**Conclusion:** Extensive *in vitro* screening will contribute to the knowledge and selection of present and new microbiome modulators. The present study shows that OS can be grouped based on different readouts, allowing to focus on a specific group, or the selection of a representative member from each group. Based on this knowledge the most suitable components can be identified and taken into clinical trials in the relevant target population or in healthy volunteer challenge models.

**Disclosure of Interest:** None declared.

### MON-LB697 EVALUATION OF THE EFFECTS OF ORAL ADMINISTRATION OF LACTOBACILLUS FERMENTUM CECT5716 LC40 TO NURSING WOMEN ON INFANT'S MICROBIOTA AND HEALTH

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**Rationale:** Consumption of probiotics can modulate the microbiota of breast milk and this, in turn, influences the health and growth of the newborn.

**Methods:** 625 mothers-child pairs participated in a randomized, double blind, and controlled study. Women were divided into 2 groups: Probiotic group that consumed 1 capsule/day of *L.fermentum* Lc40 3 × 10<sup>9</sup>cfu; Control group received 1 capsule/day with maltodextrin. 16 weeks lasted the intervention. The microbiota of the breast milk and children's feces was analyzed. The growth and health of the babies were controlled throughout the intervention period.

**Results:** 16 weeks intervention was completed by 291 mother-child pairs. A significant correlation was detect between breast milk load of *Lactobacillus*, *Staphylococcus* and *Streptococcus* with the load of *Lactobacillus*, *Staphylococcus*, *Bacteroides* and *E. coli* in the children's feces (p < 0.05) due to the modulation produced by the probiotic. Respect health parameters, it was observed that infantile colic was significantly more probable in children whose mother had higher levels of anaerobes in the milk (p = 0.044), and a higher incidence of respiratory infections was correlated with the burden of staphylococci in breast milk and the feces of babies. In addition, the intervention with *L.fermentum* Lc40 reduced the effect of *Staphylococcus* on the health of children (p < 0.05). Finally, it was found that babies of women with higher *Lactobacillus* values in breast milk had higher weight z-scores,

and *E. coli* load in children's feces was related to z scores of greater weight and height ( $p < 0.05$ ).

**Conclusion:** The microbiota of breast milk affects infant colonization and, consequently, in parameters of growth and health of babies. The modulation of the microbiota of breast milk with probiotics can induce a healthier growth of babies.

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#### MON-LB698

##### FACTORS AFFECT GROWTH OF PRETERM INFANTS RECEIVING PARENTERAL NUTRITION

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**Rationale:** Preterm infants are likely to have growth failure from both nutrition and non-nutrition factors. The research aimed to investigate the factors affecting the growth of preterm infants who received parenteral nutrition.

**Methods:** The study was a retrospective cohort collecting data from January 2012 to July 2016. The relationships were determined by multiple regression means between those factors and indices of the growth including weight increase rate, weight at age 36 weeks, time to regain birth weight and growth failure.

**Results:** A 80 preterm infants included into this study with mean gestational age of 32 weeks, mean birth weight of 1468 grams and mean weight at aged 36 weeks of 1876.38 grams. The association between the infants' growth indices and factors were shown. Time to have full enteral feeding ( $r = 0.33$ , 95% CI: 0.01–0.48) was associated significantly with weight increase rate at 36 weeks old, the birth weight [ $r = -0.53$ , 95% CI: (-445.04) – (-216.70)] was associated with weight at age 36 weeks, the initial timing of parenteral nutrition (PN) [ $r = -0.24$ , 95% CI: (-4.10) – (-0.40)], the average protein amount in parenteral nutrition ( $r = 0.39$ , 95% CI: 0.55–3.43), the initial protein amount in parenteral nutrition [ $r = -0.46$ , 95% CI: (-3.19) – (-1.00)] was associated with time to regain birth weight. Birth weight (OR = 15.90, 95% CI: 1.54–164.14) was associated with growth failure at age 36 weeks.

**Conclusion:** The most obvious nutrition factor facilitating growth of preterm infants who had received parenteral nutrition was the higher protein initiation amount in PN feeding.

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#### MON-LB699

##### TO EVALUATE THE ACCEPTABILITY (INCLUDING GASTROINTESTINAL TOLERANCE AND COMPLIANCE) OF A PAEDIATRIC ENTERAL FORMULA WITH INGREDIENTS DERIVED FROM REAL FOOD FOR CHILDREN OVER 12 MONTHS OF AGE

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**Rationale:** Blended foods being given to children requiring tube feeding is increasing. Current position statements do not recommend this <sup>(1)</sup> as it may increase the risk of tube occlusion and nutritional inadequacies<sup>(2,3)</sup>.

**Methods:** A tube feed formula has been developed to address safety and nutritional inadequacies. Study design followed the UK Advisory Committee on Borderline Substances (ACBS) criteria to support submission for prescription usage in the National Health Service (NHS). All participants ( $n = 19$ ) were tube fed, recruited from NHS settings and under the care of a dietitian/doctor. All participants were given the new formula for 7 days, Isosource Junior Mix, Nestlé Health Science. Demographic, medical data was obtained and gastrointestinal (GI) tolerance recorded. Stool type was measured using the Bristol Stool Chart.

**Results:** Participants (1–14 years) had a range of medical conditions; global developmental delay, epilepsy, cerebral palsy and Down's syndrome; 16/19 completed the 7-day trial and average daily formula intake was 730mls (480–1400 ml) for those completing. A number of participants reported positive changes in stool consistency; becoming firmer and decreasing in frequency. One child saw improved mood, eye contact and concentration. Resolution of reflux and gradual decrease in retching were observed in 2 participants. One child experienced bloating and flatulence; they were previously on a tube feed without fibre which may have caused symptoms. There were no weight changes during the study.

**Conclusion:** The new tube feed was well tolerated by majority of participants, with a decrease in GI symptoms and beneficial changes in stool type.

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**MON-LB700****IMPACT OF LOW SKELETAL MUSCLE MASS, MUSCLE QUALITY AND SARCOPENIC OBESITY ON PATIENTS AWAITING LIVER TRANSPLANTATION**

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**Rationale:** Evidence suggests that sarcopenia is associated with poor clinical outcomes and overall survival in the general surgical population. However, the significance of sarcopenia in the liver transplantation (LT) population remains unclear.

The purpose of this study is to investigate the impact of low skeletal muscle mass, muscle quality and sarcopenic obesity on patients awaiting LT.

**Methods:** We retrospectively analyzed patients who underwent LT at our center, between January 2013 and January 2018. Body composition parameters including skeletal muscle mass index (SMI), intramuscular adipose tissue content (IMAC), visceral fat area (VFA) were evaluated by preoperative plain computed tomography imaging at the level of the third lumbar vertebra (L3) and also clinical and biochemical parameters were taken. This study defined sarcopenia as a low SMI (male < 52.4 cm<sup>2</sup>/m<sup>2</sup>; female < 38.5 cm<sup>2</sup>/m<sup>2</sup>) and obesity as VFA > 100 cm<sup>2</sup>. The percentage of muscle fat infiltration (% MFI) was calculated using the following formula: % MFI = IMAC (cm<sup>2</sup>) / [IMAC (cm<sup>2</sup>) + MME (cm<sup>2</sup>)] × 100. Logistic regressions and Kaplan-Meier analysis was performed.

**Results:** The study included 94 patients (76 men) with a mean age of 60.14 (DS 8.57), 72 (76.6%) had sarcopenia and 52 (55.3%) had sarcopenic obesity. Multivariate analysis identified PCR (*p* 0.04), low SMI (*p* 0.048) and Creatinine (*p* 0.035) as independent risk factors for death after LT. There was a negative correlation between PCR and SMI (*p* = 0.01).

**Conclusion:** Sarcopenia and sarcopenic obesity were highly prevalent in liver transplantation patients. PCR and creatinine were both good predictors of mortality in this population. High SMI is an excellent predictor for survival in this group of patients.

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**MON-LB701****NUTRITIONAL AND FUNCTIONAL CHARACTERISTICS OF ELDERLY ONCOLOGICAL PATIENTS UNDERGOING MAJOR ABDOMINAL SURGERY**

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**Rationale:** To describe the functional and nutritional characteristics of onco-geriatric patients who are candidates for elective gastrointestinal surgery and to identify factors associated with malnutrition before surgery.

**Methods:** Cross-sectional analysis of prospectively maintained database of patients age 65 years and older who were candidates for elective gastrointestinal surgery for cancer between the years 2018–2019. Patients underwent Geriatric Assessment (GA) in our outpatient clinic by multidisciplinary team including geriatric MD, nurse and

dietitian. Preoperative data collected included patient's demographics and anthropometrics. Nutritional status was evaluated using the Mini Nutritional Assessment or Subjective Global Assessment. Functional parameters including: Time Up and Go test result, grip strength and frailty score (using Rockwood frailty scale) were collected. Variables described using frequencies and percentages. The Chi square test was used to examine associations between malnutrition before surgery and demographics, nutritional and functional parameters.

**Results:** 75 patients undergo GA in our clinic. The mean age was 78.70 ± 7 years and mean BMI was 26.26 ± 5.22 kg/m<sup>2</sup>. 43.5% patients (n = 30) were in the normal BMI range for age, 26.1% patients (n = 18) were underweight, 8.7% (n = 6) were overweight and 21.7% (n = 15) were obese. 23% (n = 16) lost more than 10% of their Usual Body Weight in the last 6 months and 23% (n = 16) lost between 5–10% of their UBW. 22.6% (n = 14) of the patient were diagnosed as malnourished and 37.1% (n = 23) were at risk for malnutrition. 8.8% of the patients (n = 6) were diagnosed as frail and 31% (n = 21) were diagnosed as pre-frail. 67.2% of the patients (n = 43) had grip strength in the criterion for frailty (by gender and BMI). 61.4% of the patients (n = 43) were at risk of falling according to TUG test. Factors associated with malnutrition before surgery were: frailty score ≥ 4 (*p* = 0.008), weight loss ≥ 5% (*p* < 0.001) and cancer type (*p* = 0.021).

**Conclusion:** Nutritional and functional assessment, as part of preoperative GA, identified high rates of impaired nutritional status, functional decline and frailty. These factors can influence the surgical treatment decision and improve before surgery by prehabilitation.

**Disclosure of Interest:** None declared.

**MON-LB702****DEFINITION OF A MINIMAL CORE SET OF VARIABLES TO INCLUDE IN CLINICAL TRIALS OF OBESITY INTERVENTIONS**

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\* Corresponding author.

**Rationale:** The randomized, controlled trials of obesity interventions find remarkable heterogeneity of responses among adult patients—whether the intervention pertains to lifestyle (dietary, physical activity), or is a pharmacological or surgical intervention. Indeed, most RCTs for obesity interventions include a mixture of patients that, despite meeting the inclusion criteria for the study, vary remarkably when it comes to the medical history of their disease, their associated comorbidities, and many other factors (including lifestyle and environmental factors) that may drive the heterogeneous responses to the same intervention. Only stratification-driven analysis should allow to decipher the obesity heterogeneity.

**Methods:** A group of European obesity researchers convened in 2018 to create a plan for helping shape future studies by identifying the minimal set of variables that should be included in trials of different kinds of obesity interventions (whatever the type and the endpoints of the intervention). Of course, besides this minimal core set, RCTs or other trials may collect data on additional variables, depending on the specific area of focus.

**Results:** This initiative, called @OBEDIS and funded by the JPI HDHL, was created with the aim of giving the research community a blueprint for designing future RCTs to allow the sharing and merging of datasets, and to enable meaningful subgroup analyses. To achieve this, the @OBEDIS experts surveyed the scientific literature, shared their expert opinions on a recommended minimal core set of variables to include in all future trials of adult obesity interventions, and sought to reach

consensus on both these variables and the related assessment methods.

**Conclusion:** The @OBEDIS results pave the way to new generation of relevant obese phenotype definitions, and open the door to new innovative patient stratification, driving a paradigm shift in the future

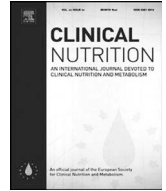
obesity treatment, going from “one-size-fits-all” to precision medicine.

References: none

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