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Ecodialysis: is it possible to design an eco-friendly system?

*Original*

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Piet Mondrian, Nolen: The Windmill in Sunlight, 1908  
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# ndt

NEPHROLOGY DIALYSIS TRANSPLANTATION

Basic and clinical renal science

# ABSTRACTS

# 51<sup>ST</sup> ERA-EDTA CONGRESS

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### SO011

THE PRO-PKD SCORE, A NEW ALGORITHM TO PREDICT RENAL OUTCOME IN AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE (ADPKD)  
**Emilie Cornec-Le Gall**, Brest, France

### SO016

TOLVAPTAN-TREATMENT OF ADPKD CONFERS PERSISTENT EGFR IMPROVEMENT: RESULTS FROM THE TEMPO 4:4 EXTENSION TRIAL **Vicente Torres**, Rochester, USA

### SO018

EFFICACY AND SAFETY OF MYCOPHENOLATE-MOFETIL VS. LEVAMISOLE IN CHILDREN WITH IDIOPATHIC NEPHROTIC SYNDROME: RESULTS OF A RANDOMIZED CLINICAL TRIAL **Biswanath Basu**, Kolkata, India

### SP410

COMBINING RENAL CELLS AND MICRO- AND NANOTECHNOLOGIES: A NEW ROUTE TO THE DEVELOPMENT OF BIOARTIFICIAL PLATFORMS FOR IN VITRO TESTING DRUG NEPHROTOXICITY **Anna Giovanna Sciancalepore**, Arnesano (LE), Italy

### MO003

A NON-TRANSCRIPTIONAL ROLE OF HYPOXIA-INDUCIBLE FACTOR (HIF)-1 IN DEFENSE AGAINST DNA DOUBLE STRAND INJURY **Tetsuhiro Tanaka**, Tokyo, Japan

### MO026

SURVIVAL OF CALCIPHYLAXIS IN END STAGE RENAL DISEASE PATIENTS FROM THE UNITED STATES RENAL DATA SYSTEM **Lu Huber**, Augusta, USA

### MO028

MESENCHYMAL STEM CELLS INDUCED IN VITRO GENERATION OF REGULATORY T-CELLS: A CELL-BASED THERAPY TO PROMOTE TRANSPLANTATION TOLERANCE **Shruti Dave**, Ahmedabad, India

### TO031

DECLINE IN ESTIMATED GLOMERULAR FILTRATION RATE AND SUBSEQUENT RISK OF MORTALITY: A META-ANALYSIS OF 35 COHORTS IN THE CKD PROGNOSIS CONSORTIUM **Josef Coresh**, Baltimore, USA

## Eight Best Abstracts presented by Young Authors

*The authors of the abstracts below will receive a grant of EUR 1,000, free congress registration and a diploma.*

### SO011

THE PRO-PKD SCORE, A NEW ALGORITHM TO PREDICT RENAL OUTCOME IN AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE (ADPKD)  
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### SO020

ENDOVASCULAR RENAL DENERVATION IN DIALYSIS-DEPENDENT RENAL FAILURE TO REDUCE CARDIOVASCULAR RISK **Neil Hoyer**, Dunedin, New Zealand

### SP522

OBSERVATIONAL STUDY OF SURVEILLANCE BASED ON THE COMBINATION OF ON-LINE DIALYSANCE AND THERMODILUTION METHODS IN HEMODIALYSIS PATIENTS WITH ARTERIOVENOUS FISTULAS **Néstor Fontseré**, Barcelona, Spain

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MESENCHYMAL STEM CELLS INDUCED IN VITRO GENERATION OF REGULATORY T-CELLS: A CELL-BASED THERAPY TO PROMOTE TRANSPLANTATION TOLERANCE **Shruti Dave**, Ahmedabad, India

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PREDICTORS OF CONGESTIVE HEART FAILURE EVENTS IN INCIDENT PATIENTS ON HEMODIALYSIS - RESULTS FROM THE INTERNATIONAL MONDO INITIATIVE **Viviane Silva**, Curitiba, Brazil

### MP622

DONOR TUBULAR PHOSPHATE HANDLING INDEPENDENTLY PREDICTS RECIPIENT OUTCOMES

AFTER LIVING KIDNEY DONATION **Marco van Londen**, Groningen, The Netherlands

**TO026**

TLR4 LINKS PODOCYTES WITH THE INNATE IMMUNE SYSTEM TO MEDIATE GLOMERULAR INJURY IN PATIENTS WITH TYPE 2 DIABETES AND MICROALBUMINURIA (MA) **Emanuele Parodi**, Genoa, Italy

**Best Abstracts presented by Young Authors**

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**SO001**

CRASHED - A NOVEL RISK STRATIFICATION TOOL FOR PREDICTING AKI **Vijaya Ramasamy**, Wrexham, UK

**SO007**

BRANCHED-CHAIN AMINO ACID SUPPLEMENTATION ACCELERATES CYST GROWTH IN A MOUSE MODEL OF AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE **Junya Yamamoto**, Sapporo, Japan

**SO017**

CLINICAL CHARACTERISTICS AND OUTCOMES OF INFANTS ON CHRONIC DIALYSIS **Enrico Vidal**, Padova, Italy

**SO025**

THE RELATIONSHIP BETWEEN ACCUMULATING TISSUE PHOSPHATE AND CALCIUM IS DEPENDENT ON VITAMIN K STATUS IN EXPERIMENTAL CHRONIC KIDNEY DISEASE **Jason Zelt**, Kingston, Canada

**SO026**

IMPROVEMENT OF CKD-MBD SERUM PARAMETERS IS ASSOCIATED WITH BETTER SURVIVAL. THE 3-YEAR FOLLOW-UP COSMOS STUDY **Marla Dionisi**, Oviedo, Spain

**SO027**

CELLULAR AND MOLECULAR MECHANISMS INVOLVED IN VASCULAR CALCIFICATION: THE ROLE OF LAMIN A **Pablo Roman-Garcia**, Oviedo, Spain

**SO031**

MECHANISMS AND RELEVANCE OF ENAC REGULATION BY EGF: ROLE IN THE DEVELOPMENT

OF SALT-SENSITIVE HYPERTENSION AND PKD **Alexander Staruschenko**, Milwaukee, USA

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ANALYSIS OF ABDOMINAL CT SCANS IN 35 PATIENTS WITH ENCAPSULATING PERITONEAL SCLEROSIS: VALIDATION OF TWO DIAGNOSTIC SCORES AND PREDICTION OF THE MACROSCOPICAL PHENOTYPE **Joerg Latus**, Stuttgart, Germany

**SO040**

ALANYL-GLUTAMINE IN PERITONEAL DIALYSIS FLUID LEADS TO INCREASED EX-VIVO STIMULATED CYTOKINE RELEASE OF PERITONEAL CELLS **Rebecca Herzog**, Vienna, Austria

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PREGNANCY OUTCOMES IN RENAL TRANSPLANT RECIPIENTS: A SINGLE-CENTRE STUDY **Sokratis Stoumpos**, Glasgow, UK

**SP011**

ROLE OF EXTRACELLULAR MATRIX DEFECTS IN THE PROGRESSION OF THE POLYCYSTIC KIDNEY DISEASE **Caroline Clerckx**, Paris, France

**SP013**

RENAL VOLUME IN CHILDREN WITH AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE **Svetlana Papizh**, Moscow, Russian Federation

**SP066**

WNT10A OVEREXPRESSION IN KIDNEY FIBROBLASTS INDUCES KIDNEY FIBROSIS IN ACUTE INTERSTITIAL NEPHRITIS **Akihiro Kuma**, Kitakyushu, Japan

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EFFECTS OF CILASTATIN ON GENTAMICIN-INDUCED RENAL DAMAGE. IN VITRO AND IN VIVO EVIDENCE **Alberto Lázaro**, Madrid, Spain

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SYNDECAN-1 IN DECOMPENSATED HEART FAILURE: ASSOCIATION WITH RENAL FUNCTION AND MORTALITY **Tacyano Leite**, Fortaleza, Brazil

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FREQUENCY AND DOSING OF URIC ACID LOWERING THERAPY IN PATIENTS WITH CKD 3 - BASELINE DATA OF THE GERMAN CHRONIC KIDNEY DISEASE COHORT **Markus Heisterkamp**, Hannover, Germany

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SERUM SODIUM RATE OF CHANGE AND VARIABILITY: ASSOCIATIONS WITH SURVIVAL IN INCIDENT HEMODIALYSIS PATIENTS **Joselyn Reyes-Bahamonde**, NY, USA

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URINARY AND SEROLOGICAL MARKERS OF COLLAGEN DEGRADATION ARE ASSOCIATED WITH DISEASE SEVERITY AND INFLAMMATION IN IGA NEPHROPATHY PATIENTS **Federica Genovese**, Herlev, Denmark

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THE ROLE OF PKC- $\beta$  AND MICRORNAS IN DIABETIC NEPHROPATHY **Malte Kölling**, Hannover, Germany

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CORRELATION OF PODOCYTE ULTRASTRUCTURAL CHANGES AND LEVEL OF PROTEINURIA IN PATIENTS WITH DIFFERENT FORMS OF PRIMARY GLOMERULOPATHIES **Ian Proletov**, Saint-Petersburg, Russian Federation

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**ECODIALYSIS: IS IT POSSIBLE TO DESIGN AN ECO-FRIENDLY SYSTEM?**

**Martina Ferraresi**, Turin, Italy

**SP450**

NATIONAL RATES OF ADMISSION, MORTALITY AND POST-PERITONITIS TECHNIQUE SURVIVAL ACCORDING TO DAY OF THE WEEK IN ENGLISH PERITONEAL DIALYSIS PATIENTS **James Fotheringham**, Sheffield, UK

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CLINICAL RELEVANCE OF FREE WATER TRANSPORT AND EFFLUENT BIOMARKERS IN THE DETECTION OF ENCAPSULATING PERITONEAL SCLEROSIS **Deirisa Lopes Barreto**, Amsterdam, The Netherlands

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NONALCOHOLIC FATTY LIVER DISEASE (NAFLD) PROVEN BY TRANSIENT ELASTOGRAPHY IN HEMODIALYSIS PATIENTS; IS IT A NEW RISK FACTOR FOR ADVERSE CARDIOVASCULAR EVENTS? **Ivana Mikolasevic**, Rijeka, Croatia

**SP483**

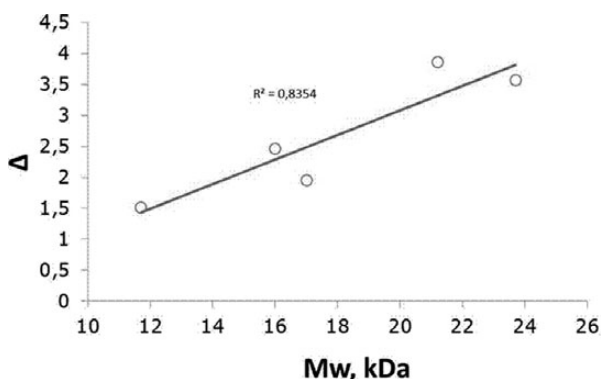
OVERHYDRATION IS ASSOCIATED WITH ENDOTHELIAL DYSFUNCTION IN HEMODIALYSIS (HD) PATIENTS: ROLE OF PENTAXIN 3 (PTX3) AND ROS PRODUCTION BY NEUTROPHILS **Giovanni Pertosa**, Bari, Italy

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REDUCED INFECTION RATES IN A DIALYSIS NETWORK WITH A NOVEL SURVEILLANCE PROGRAMME **Maryam Khosravi**, London, UK

**Results:** The data of 94 (48 from group A and 46 from group B) patients (53M and 41F) were fully analysed. The median age was 70 (27-92) years and dialysis vintage was 47.2 (7.5+454.6) months. No difference was found in the demographic characteristics and treatment parameters. 164 MID sessions and 161 POST sessions were analysed. A statistically significant difference in RR (%) was found for three MMW molecules:  $\beta$ -2 Microglobulin ( $\beta$ 2M), Complement Factor D (CFD) and Retinol Binding protein (RBP). Values were 80,1±0,4 in POST vs 81,6±0,4 in MID ( $p=0,01$ ) for  $\beta$ 2M; 72,8±0,8 in POST vs 76,4±0,6 in MID ( $p=0,0003$ ) for CFD and 24,1±0,9 in POST vs 30,0±0,8 in MID ( $p=0,003$ ) for RBP. The other investigated molecules, ADMA, Homocystein, Leptin and Myoglobin, shown a better MID RR but it is not statistically significant. The reinfused volume was significantly higher in MID than in POST (average total volume of 43,63 L in MID vs 20,96 L in POST), but also the amount of reinfused volume in MID exchanged in its post dilution stage (estimated around the 2/3 as shown in Maduell publication) is significantly higher (28,8 L in MID vs 20,96 L in POST); this could explain the deuration capability of MID respect POST for the MMW molecules, indeed, was found a linear correlation ( $R^2$  0.83) between the delta differences in RR (RR Mid - RR Post) and MW of molecules (Figure 1). No significant differences between MID - and POST-dilution were observed for small MW molecules deuration (assessed by second generation daugirdas Kt/vd), neither for Albumin loss.

**Conclusions:** MID is superior to remove MMW molecules as compared to POST. This very likely can be related to an higher total amount and efficiency of substituted volume obtained in the MID group as compared to the POST group.



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**SP413 ECODIALYSIS: IS IT POSSIBLE TO DESIGN AN ECO-FRIENDLY SYSTEM?**

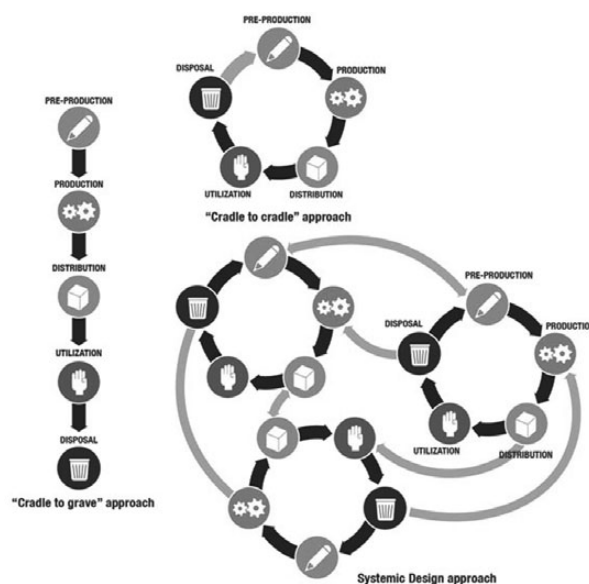
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**Introduction and Aims:** Attention to the environmental impact is still limited in medicine. Chronic Hemodialysis produces about 600000 tons of plastic wastes per year. The economic crisis and the awareness of the ecosystem induced to focus attention on the lifespan of disposables, "from cradle to grave". A new outlook is presently focussed on recycle, that is the subsequent start of new cycles leading to a "from cradle to cradle" model: a "new life" for the waste products (Fig 1). Aim of the study is an analysis of the disposables employed in chronic hemodialysis, for identifying strategies limiting the environmental impact and containing the costs.

**Methods:** An analysis of the disposables employed on dialysis and of their "final destiny" (the grave) was performed in 3 subsequent bicarbonate dialysis sessions with 3 different dialysis machines. All disposables and packagings were photographed, classified, weighted and analyzed as for type of materials, possibility to recycle, contamination with blood or biological fluids.

**Results:** Each dialysis session produces between 4 and 6 kg of wastes; it may be divided into about 2 Kg of residual fluids (to be discharged); 2 Kg of "contaminated" wastes (i.e. in contact with blood or fluids) and 2 kg of "non contaminated" wastes. The differentiation is crucial, as the weight of contaminated waste products is the main determinant of disposal cost (approximately 2 Euro/kg in Italy). Furthermore, each dialysis session produces between 0.9 and 1.4 kg of packaging (cardboard and plastic); this is usually discharged separately, but where this procedure is not followed, it adds considerably to the volume and weight of the final wastes. Therefore, a undifferentiated waste collection may produce over 6 kg of waste products per session; the cost (up to 12-14 Euros) corresponds to 20-40% of the cost of the disposables. While all the cardboard and paper wastes are readily recyclable, the plastic wastes (non contaminated) can theoretically enter a dedicated recycle process. In this regard, the wastes may be classified into "families" of different plastic materials, with different compatibility for joint recycling. However, in most of the cases the types of plastic components are not identifiable and separable. Further problems are related with: Packaging oversize: the content of most of the packaging of dialysis materials occupies between 50 and 75% of the space, increasing costs (production, wastes,



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transportation). -Emptying: there are no automated systems for emptying residual fluids after the dialysis session. -Difficult separation of materials: many packages are laminated made of different components. -Difficult separation of contaminated material: there is no clear definition of "contaminated".

**Conclusions:** Attention to the life cycle of the dialysis disposables may conjugate the attention to our planet, reducing the "mountain" of wastes produced every year; simple tasks, as careful emptying and differentiating between "contaminated" and "non contaminated" wastes may lead to a 20% saving of the costs of a dialysis session. Cooperation with the Industry is needed for designing recycling strategies in keeping with the modern "cradle to cradle" approach.

**SP414 SURFACE, A PARAMETER TO CONSIDER IN HIGH CONVECTION VOLUME HDF**

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**Introduction and Aims:** Convection volume seems to be crucial to the survival benefits proposed for HDF. However, high convection requires increasing transmembrane pressure (TMP) which in turn may change the membrane's behaviour and dialyser's performances. We wanted to characterise the influence of membrane surface area on the physics and on the removal performances of high convection volume on-line post-dilutional HDF.

**Methods:** Twelve stable dialysis patients were successively treated with Amembris® 1.8 m<sup>2</sup> and 2.3 m<sup>2</sup> dialysers, and two high convection flows, one (QUF-optimal) obtained while maintaining the dialysis setting at the maximum in vivo global ultrafiltration coefficient (GKD-UF max) and the other one at the maximum convection flow (QUF-max) limited only by the European Best Practice Guidelines (EBPG) (<30% blood flow / 300 mmHg of TMP) for 1 week each. Continuous sampling of spent dialysate was performed in all dialysis sessions and total mass of urea, creatinine, and total proteins were measured. SDS-PAGE scanning of the removed proteins and ELISA measurements of  $\beta$ -2-microglobulin (B2M), retinol binding protein, lambda light chains of immunoglobulins,  $\alpha$ 1-antitrypsin and albumin, were performed.

**Results:** Increasing from QUF-optimal to QUF-max using the 1.8 m<sup>2</sup> dialyser resulted in frequent TMP alarms and only 33% of the sessions reached the prescribed convection volume. Increasing the dialyser's surface to 2.3 m<sup>2</sup> significantly decreased the number of alarms and increased the number of sessions reaching the aimed convection volume (100% at QUF-optimal and 79% at QUF-max). The total amount of urea removed was 545±43, 473±32 and 491±44, 471±38 mmol/session in HDF with QUF-optimal and QUF-max respectively for the 1.8 and 2.3 m<sup>2</sup> surface (NS). The corresponding Kt/V values were 1.77±0.05, 1.78±0.05 and 1.75±0.04, 1.75±0.05, (NS). Removal of low mol wt proteins (observed on SDS-PAGE pattern analysis) and particularly B2M did not change in the 4 different conditions (274±35, 290±35, 266±24 and 283±35 mg/session (NS)). High molecular weight proteins removal increased with convection, notably for albumin (from 386±57 to 793±158 with 1.8 m<sup>2</sup> and from 559