Poster Sessions
ALI and inflammation 0035-0045

0035

PENTRAXIN 3 (PTX3) AND C REACTIVE PROTEIN IN ALI/ARDS: PRELIMINARY RESULTS FROM A PROSPECTIVE STUDY

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INTRODUCTION. PTX3 has recently been described as an acute phase mediator of innate immunity. Together with C Reactive Protein (CRP), it belongs to the pentraxin superfamily. PTX3 is produced by a variety of cells, located almost everywhere (e.g. dendritic cells), while CRP is produced only by the liver. PTX3 plays a key role in the activation and the amplification of inflammation. ALI/ARDS is characterized by an important inflammatory reaction, often both local and systemic.

METHODS. We enrolled 9 patients affected by ALI/ARDS. We measured PTX3 and CRP levels on the first 2 days from ICU admission, then every three days for the first month and then once a week, until ICU discharge. We also measured PTX3 levels in the bronco alveolar lavage (BAL) fluid. 102 plasma samples and 14 BAL fluids were collected and tested. We registered data on etiology, pulmonary mechanics, gas exchange, systemic inflammation, organs function, blood cells counts and outcome at hospital discharge.

RESULTS. PTX3 plasma levels were high and within a very wide range (2.02-3872.64 ng/ml; 111.47 $\pm$ 467.21 ng/ml), while CRP levels were relatively low and less variable (0.16-49 mg/dl; 15.94 $\pm$ 11.14 mg/dl). The levels of the two mediators showed no correlation. PTX3 was present in BAL fluids in variable concentrations (0-19.4 ng/ml; 3.28 $\pm$ 5.63 ng/ml). We found a significant correlation ($p<0.05$; r 0.673) between the levels of PTX3 in BAL fluid and plasma. PTX3 levels on the first day were significantly different between survivors and not-survivors at hospital discharge ($p<0.05$; 1.310$\pm$0.457 log(ng/ml) vs 2.401$\pm$0.825 log(ng/ml)). Moreover PTX3 values were significantly higher in patients with septic shock than in non shock patients ($p<0.05$; 1.532$\pm$0.794 vs 1.223$\pm$0.478 log(ng/ml)). PTX3 values were significantly ($p<0.05$) related to SvO_2 (r -0.316), arterial blood pH (r -0.371) and SOFA values (r 0.591).

CONCLUSION. PTX3 seems to be a key factor for the development, the amplification and the outcome of this syndrome; the levels of the two mediators appear not to be related, suggesting a possible individual role for each one.

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0036

NATRIURETIC PEPTIDES FOR THE ASSESSMENT OF SMOKE INHALATION INJURY

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INTRODUCTION. Smoke intoxication remains a major cause of mortality after smoke inhalation and remains difficult to evaluate by biological markers.
Increased plasma levels of atrial natriuretic peptide (ANP) and brain natriuretic peptide (BNP) have been identified as predictors of cardiac dysfunction and prognosis in congestive heart failure and ischemic heart disease.
In severe sepsis patients, some data are now available about the possible prognostic value of natriuretic peptides.
The aim of the present study was to determine the role of the N-terminal prohormone forms of ANP (NT-proANP) and BNP (NT-proBNP) after smoke inhalation injury.

METHODS. Retrospective, clinical study in a specialised burn intensive care unit. Population: 9 patients with severe inhalation injury confirmed by fiberoptic examination and clinical findings (close space fire, soot on the face and in the mouth; HbCO >10%) and 10 control subjects with no smoke exposure. All the patients had burn wounds < 5 $\pm$ 2% TBSA.
Collection of clinical and demographic data in relation to ANP, BNP, and IL-6 in plasma over a period of 4 days.

RESULTS. There was no significant difference between the two groups for age, burn surface area, and medical history.
We found a significant increase in ANP (113.7+/-9.9 vs. 13.8+/-1.3 pg/ml) and BNP (81.4+/-3.6 vs. 6.5+/-0.8 pg/ml) after inhalation injury.
Plasma ANP peaked together with IL-6 and peaks of ANP and IL-6 were significantly correlated ($p<0.01$).

CONCLUSION. ANP and BNP increase significantly in patients with severe inhalation injury.
BNP reflects left ventricular dysfunction and could be related to the potential cardiac depression following smoke intoxication and particularly cyanide and carbon monoxyde exposition associated with hypoxaemic conditions.
ANP is related to IL-6 production rather than to cardiovascular dysfunction.
Further studies are necessary to confirm these preliminary results.

0037

CRITICAL ROLE OF NEUTROPHIL P21-ACTIVATED KINASE IN LPS-INDUCED ACUTE LUNG INJURY

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INTRODUCTION. Excessive recruitment of polymorphonuclear leukocytes (PMNs) into the lung is critical in the early phase of acute lung injury (ALI/ARDS). Although chemokines and adhesion molecules have been demonstrated to initiate leukocyte-endothelial interaction, pathways which regulate PMN migration through the alveolo-capillary membrane remain to be identified. Here, we studied the role of the small GTPases effector p21-activated kinase (PAK) for PMN migration in LPS-induced ALI.

METHODS. LPS-induced PMN migration into the different compartments of the lung was investigated in wild type male C57Bl/6 mice. PAK activity was inhibited by injecting a specific blocking peptide. A fluorescent blocking peptide was injected to investigate its cellular targets in vivo. PMN migration through a layer of pulmonary endothelial cells was investigated to determine the role of neutrophil PAK. To test whether this translates to humans, F-actin polymerization, oxidative burst, and adhesion were investigated in human PMNs.

RESULTS. PMN migration into the lung interstitium and alveolar airspace, but not accumulation in the pulmonary vasculature was reduced when PAK activity was blocked. Injection of a fluorescently labeled peptide identified leukocytes as a major cellular target for its blocking activity. The majority of fluorescent PMNs were found in the blood, while no positive PMNs were found in the BAL, indicating that PAK-activation was required for PMNs to emigrate from the circulation. In addition, migration towards a chemotactic gradient was reduced when PAK activity was blocked in PMNs, highlighting a critical role for PAK in PMNs. In human PMNs, blocking PAK activity disrupted F-actin polymerization, static adhesion, and oxidative burst of adherent PMNs.

CONCLUSION. PAK is a critical mediator of LPS-induced PMN migration into the lung and may be an attractive target for the treatment of acute lung injury.

REFERENCE(S). 1. Reutershan J, Sequential recruitment of neutrophils into lung and bronchoalveolar lavage fluid in LPS-induced acute lung injury. AJP Lung 2005 289:L807-L815. 2. Stockton RA, p21-activated kinase regulates endothelial permeability through modulation of contractility. JBC 2004 279:46621-46630.

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0038

IMPACT OF TRANSFORMING GROWTH FACTOR BÊTA 1 AND PROCOLLAGEN III ON THE MORTALITY OF ACUTE RESPIRATORY DISTRESS SYNDROME

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INTRODUCTION. To determine whether blood and bronchoalveolar lavage fluid levels of the TGFβ-1 and the Procollagen III (PIIINP) are associated with the mortality of patients with ARDS.

METHODS. We included 56 patients with ARDS, after patient's next of kin consent, in a prospective study. Patients were ventilated with a protective mechanical ventilation according to NIH. Bronchoalveolar lavages (BAL) and blood samples were performed on the first 48 hrs of ARDS for dosing TGFβ-1 and PIIINP. Survival was registered at day 28. BAL and blood levels of TGFβ-1 and PIIINP were compared by Mann-Whitney test. We determined cut-off values of these mediators using ROC curves. Multivariate logistic regression was performed to determine the effect of TGFβ-1 and PIIINP on the risk of death while controlling the effect of age, sexe, SOFA, Lung injury score, PaO_2/FiO_2, polymorphonuclear count in BAL.

RESULTS. Table 1 shows the levels of PIIINP in survivors and non survivors. BAL fluid and blood levels of TGFβ-1 were not statistically differents in survivors and nonsurvivors. Table 2 summarizes the results of the multivariate analysis.

TABLE 1.
Levels of PIIINP (μg/L) in BAL fluid and blood in survivors and non survivors

	Survivors (n=36)	Nonsurvivors (n=20)	p value
BAL levels of PIIINP	1.7 [0.7-4.1]	5.9 [1.7-24.1]	0.024
Blood levels of PIIINP	7.7 [5.0-10.7]	14.9 [9.3-18.6]	0.001

TABLE 2.
Results of multivariate analysis for the risk of death determined on inclusion

	Odds Ratio (95% CI)	p value
Blood levels of PIIINP>=8.95μg/L	4.82 (1.16-20.01)	0.03
BAL levels of PIIINP >= 4.0μg/L	4.27 (1.07-16.99)	0.04

CONCLUSION. Early increased levels of Procollagen III Peptide in blood and in BAL fluid, but not levels of Transforming Growth Factor β-1, are associated with an increased risk of death in patient with acute respiratory distress syndrome.

0039

ACUTE LUNG INJURY: POSTCONDITIONING WITH A VOLATILE ANAESTHETIC

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INTRODUCTION. Lipopolysacccharide (LPS)-stimulated alveolar epithelial cells (AEC), an in vitro model for acute lung injury, show enhanced expression of ICAM-1, CINC-1 and MCP-1. These inflammatory mediators are involved in neutrophil recruitment, which interact with target cells and induce cell death (1). While postconditioning studies focused on myocardial ischemia-reperfusion damage (2), we investigated the effects of AEC postconditioning with a volatile anaesthetic to protect the lung against an ongoing injury.

METHODS. Rat AEC were stimulated with LPS for 2 h and postconditioned with 2.2% Sevoflurane (Sevorane®, Abott, Switzerland) for 2, 4, 6, 8, 12, 18, 24 h in the presence of LPS in an airtight chamber (Oxoid anaerobic jar, Oxoid AG, Switzerland) in air/ 5% CO2. Supernatants were used to perform CINC-1 and MCP-1 ELISAs and Western blots with soluble ICAM-1. Cell-based ICAM-1 was detected with ELISA technique. Functional assays such as chemotaxis and neutrophil adherence were performed.

RESULTS. Exposure of LPS-stimulated AEC to sevoflurane showed a significant decrease of CINC-1 (4h 32%, p=0.0034; 12h 43%, p= 0.0010), and MCP-1 (4h 11%, p=0.0298; 12h 37%, p= 0.0013) in comparison to the LPS control group without postconditioning. Efficient downregulation of these inflammatory mediators was observed at 4 h and at 12 h of postconditioning, while no difference was seen at the time points 2h, 6h, 8h, 18h and 24h. Cell ICAM-1 was decreased by 64%, p=0.0011 (4h) and 100%, p=0.0007 (12h), a sevoflurane induced attenuation of soluble ICAM-1 was seen at 4h (83%; p=0.0201) and 12h (55%; p=0.0390). Chemotaxis showed a decrease of migrated PMN to the supernatant of the LPS/sevoflurane group compared to the LPS group: at 4h the difference was 77%, p=0.0324 and at 12h 48%, p=0.0002. Adherence of neutrophils to AEC was decreased by 71%, p=0.0001 after 4h of sevoflurane postconditioning.

CONCLUSION. Sevoflurane mediates cytoprotection in the respiratory compartment in a model of anaesthetic postconditioning by reducing expression of inflammatory mediators in a biphasic way. A biological consequence could be shown by reduced neutrophil migration and adherence.

REFERENCE(S). 1) Beck-Schimmer B, Eur Resp J 2002.2) Yellon DM, Lancet 2006.

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0040

COMBINED EFFECTS OF ACTIVATED PROTEIN C AND THROMBIN ON THE VISCOELASTICITY OF HUMAN ALVEOLAR EPITHELIAL CELLS

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INTRODUCTION. The structural integrity of the alveolar monolayer, which is compromised in acute lung injury (ALI), is regulated by the balance between cell-cell and cell-matrix tethering forces and centripetal forces arising from cytoskeleton tension. Thrombin (Thr), which is implicated in the regulation of permeability in ALI, stiffens alveolar epithelial cells, potentially altering the balance of forces in the cell (1). Activated Protein C (APC) induces a barrier-protective signalling in the endothelium (2). Therefore, both Thr and APC may affect alveolar barrier integrity by modulating the balance of forces in the cell monolayer. The aim of this study was to investigate the combined effects of APC and Thr on the viscoelastic properties of human alveolar epithelial cells in culture.

METHODS. Cell viscoelasticity was assessed by optical magnetic twisting cytometry (1). Cultured alveolar epithelial cells (A549) were incubated with APC (1 h) at concentrations of 0.1, 2.5 and 50 μg/ml or with culture medium (control). Ferromagnetic beads (4.5 μm) coated with RGD peptide were attached to cell surface receptors and bound tightly to the cytoskeleton. The beads were magnetized, sinusoidally twisted (0.1 Hz) and the cell elastic modulus (G') was computed from twisting torque and bead displacement. Subsequently, Thr (0.5 U/ml final concentration) was added to the wells and G' measured 3 min after the Thr challenge (N=9 wells for each treatment).

RESULTS. Treatment with APC did not induce significant change in G'. Thr induced a ~2.5-fold increase in G' in control cells. Treatment with APC did not modify the thrombin-induced cell stiffening for low APC concentrations of 0.1 and 2.5 μg/ml. By contrast, an APC concentration of 50 μg/ml significantly ($p<0.05$) reduced the increase in G' induced by thrombin: from a 2.5±0.1 fold increase to a 1.9± 0.1 fold increase.

CONCLUSION. A high concentration of APC reduced the stiffening induced by Thr in alveolar epithelial cells. This reduction in cell viscoelasticy may result in decreased centripetal forces during the cell stretching owing to mechanical ventilation. Therefore, APC may facilite the force equilibrium determining monolayer integrity in ALI.

REFERENCE(S). (1) Trepat et al. J. Appl. Physiol. 98: 1567-1574, 2005. (2) Feistritzer et al. Blood 105: 3178-3184, 2005.

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0041

ROLE OF PHOSPHOINOSITIDE 3-KINASE GAMMA IN MECHANOTRASDUCTION: AN EXPERIMENTAL STUDY

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INTRODUCTION. High stretch ventilation is a potent stimulus to cytokines release and nitric oxide (NO) production. PI3Ks have been involved in an increasing number of signal trasduction pathways. We compared the effects of PI3K gamma activity on cytokines release and endothelial NO production during mechanical stretch in an isolated-perfused lung model.

METHODS. In wild type (WT), knock out (KO) PI3Kgamma mice, lungs were ventilated and perfused in random order with 2 setting: EIP –25 cmH2O and EEP 0 cmH2O (STRESS) or EIP –10 cmH2O and EEP –3 cmH2O (NO STRESS). At the end of each experiment pulmonary activity of ERK, Akt, NF-kB, eNOS and release of IL-6, MIP-2, TNF-alpha, nitrate/nitrite (NOx) on pulmonary perfusate were measured.

RESULTS. See table 1. Data are mean ± SD.

TABLE 1.
Table 1

	STRESS +/+	STRESS -/-	NO STRESS +/+	NO STRESS -/-
pERK	3.38±0.05 * °	0.87±0.01	1±0	0.86±0.04
pAkt	1.28±0 * °	0.63±0.01	1±0	0.62±0.04
p eNOS	3.03±0.03 * °	1.76±0.01	1±0	0.79±0
NF-kB	0.35±0.07	0.33±0.09	0.32±0.05	0.31±0.04
IL-6 (pg/ml)	1106±126 °	1244±150	350±97	340±85
MIP-2 (pg/ml)	1009±170 °	920±98	433±73	400±50
TNF alpha (pg/ml)	336±46 °	289±56	76±2	86±1
NOx (nmol/ml)	1.39±0.1 * °	0.82±0.4	0.8±0.1	0.8±0.1

** STRESS +/+ vs STRESS -/- ; ° STRESS +/+ vs NO STRESS +/+*

CONCLUSION. During high stress ventilation PI3K gamma activity had no effect on NF-kB activity and cytokines release. The release reduction of nitrate /nitrite in KO mice may be Akt mediated.

0042

"HIGH PEEP" VS "LOW PEEP" VENTILATORY STRATEGIES TO PROTECT FROM VILI

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INTRODUCTION. Fitting on the shape of airway opening pressure/time (Pao/t) curve a power equation Pao=a*t b+c, values of b=1 indicates absence of tidal recruitment and hyperinflation. These values can be reached obtaining full lung recruitment (HIGH PEEP) or keeping part of the lung closed (LOW PEEP). Apoptosis may be involved in the mechanisms related to lung protective strategies. HIGH PEEP and LOW PEEP strategies on inflammatory signals and pulmonary apoptosis were compared in an isolated model of acute lung injury.

METHODS. In 35 mice, ALI was induced with lung lavage. Lungs were ventilated for three hours in random order with: Vt of 20 ml/kg and zero PEEP (STRESS); Vt 6 ml/kg, several sustained inflations and raising PEEP until b=1 (HIGH PEEP); Vt 6 ml/Kg and raising PEEP until b=1 without sustained inflations (LOW PEEP); were not ventilated (CONTROL), were not lavaged (SHAM). At the end of each experiment pulmonary concentration of IL 6, activity of ERK, Caspase 3, P38, JNK, histological lung damage (HLD) score and percentage of apoptotic cells were measured.

RESULTS. See table 1. Data are mean ± SD

TABLE 1.
Table 1

	SHAM	CONTROL	HIGH PEEP	LOW PEEP	STRESS
Vt (ml/kg)	0	0	6	6	20
PEEPtot (cmH2O)	0	0	15±0.3	9±0.2	0
pERK	1±0	3.15±0.49	2.10±0.85 * °	1.15±0.07 * °	5.45±1.77
Caspase 3	1±0	10.15±1.91	21.95±2.62 *	23.5±4.24 * °	8.35±0.49
pp38	1±0	0.95±0.07	0.25±0.07 * °	0.2±0 * °	2.3±0.57
pJNK	1±0	1.10±0.42	0.65±0.21 * °	0.4±0.14 * °	2.05±0.35
IL 6 (pg/ml)	2150±509	2555±937	5503±682 * °	5686±681 * °	9372±166
HLD score	0	4.8±0.5	4.2±1.2 *	4.4±0.8 *	6.3±1.1
Apoptotic cells %	0	2	5 * °	5 * °	0

** p< .05 HIGH and LOW PEEP vs STRESS; ° p< .05 HIGH and LOW PEEP vs CONTROL*

CONCLUSION. "HIGH PEEP" and "LOW PEEP" ventilatory strategies provide similar attenuation of pulmonary inflammation and histological lung damage through a pro-apoptotic signal of similar magnitude.

0043

SOLUBLE AND BOUND ADHESION MOLECULES AND CYTOKINES IN PATIENTS WITH ACUTE LUNG INJURY

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INTRODUCTION. A number of adhesion molecules and cytokines are involved in the pathological process of lung injury. However, few studies have investigated the pathophysiological changes during ALI clinically and systematically. In particular, the possible correlations and/or ROC curve between cytokines and adhesion molecules have not yet been examined. In the present study, we measured the levels of soluble (sICAM-1, sE-selectin and sVCAM-1) and bound (CD11a, CD11b and CD18) adhesion molecules in ALI patients, and then investigated the correlations between the levels of the adhesion molecules and those of the inflammatory cytokines IL-8 and TNF-alpha to determine whether these factors are involved in the specific pathophysiology of ALI.

METHODS. We conducted a case-control study comparing ALI and ALI-free patients. Twenty-seven adult patients were assigned to an ALI-free group (14 patients) or an ALI group (13 patients). The criteria for the diagnosis of ALI were in accordance with American-European Consensus Conference Difinition. Soluble adhesion molecules (sICAM-1, sE-selectin and sVCAM-1) were measured by enzyme-linked immunosorbent assays, while bound adhesion molecules (CD11a, CD11b and CD18) were measured by flow cytometry.

RESULTS. There were no differences between the groups for age or gender or the diagnostic categories. The levels of all the factors, except for CD11a and CD18, were significantly higher in the ALI group than in the ALI-free group. In the ALI group, the TNF-alpha level was correlated with the levels of all the other factors (sICAM-1, P<0.05; sE-selectin, P<0.01; sVCAM-1, P<0.05; CD11a, P<0.01; and CD11b, P<0.01), except for CD18, whereas the IL-8 level was only correlated with the levels of sICAM-1 (P<0.05), sE-selectin (P<0.05) and CD11b (P<0.01). For the soluble adhesion molecules, the area under the ROC curve (AUC) values for sICAM-1, sE-selectin and sVCAM-1 were 0.786 (P=0.012), 0.865 (P=0.001) and 0.706 (P=0.069), respectively. For the bound adhesion molecules, the AUC values for CD11a, CD11b and CD18 were 0.720 (P=0.052), 0.830 (P=0.004) and 0.464 (P=0.752), respectively.

CONCLUSION. The sE-selectin level is significantly higher than those of other soluble adhesion molecules, and most strongly correlated with the TNF-alpha and IL-8 levels in ALI. CD11b expression in the blood is strongly involved in ALI, whereas CD18 expression is not. E-selectin and CD11b appear to be involved in the specific pathophysiology of ALI, based on their greater areas under the ROC curve.

0044

IGF-I OVEREXPRESSION IN C57BL/6 MOUSE LUNG INDUCES INFLAMMATORY RESPONSE BUT NO PULMONARY FIBROSIS

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INTRODUCTION. Pulmonary fibrosis (PF) is characterized by excessive lung mesenchymal cell activation and extracellular matrix deposition. Although most PF is induced after repetitive or chronic lung inflammation, a significant portion of PF occurs simultaneously without apparent inflammation. Extensive studies have shown that cytokines that regulate the inflammation and tissue repair process play essential roles in PF. Several investigators have shown that overexpression of TGF-β1, IL-1β, PDGF, TNF-α and GM-CSF can induce at least patchy fibrosis in murine lungs.
Insulin-like growth factor I (IGF-I) is a cytokine homologous to insulin. One of its many bioactivities is stimulating lung mesenchymal cell proliferation and extracellular matrix synthesis in vitro, which are typical characteristics of PF. Also, previous studies in our lab have shown that IGF-I was significantly increased in bronchoalveolar lavage fluid from patients with fibroproliferative ARDS. Hypothesis: IGF-I induces pulmonary fibroproliferation.

METHODS. We used a murine animal model and adenovirus as a method of gene transfer to overexpress human IGF-I in mouse lungs. We examined the effects of IGF-I overexpression on these lungs at days 3, 7, 14, 21 and 42 after the gene delivery by examining the inflammation and collagen deposition in the lungs.

RESULTS. IGF-I transgene was strongly and transiently expressed in C57BL/6 mouse lungs after adenovirus-mediated gene transfer. IGF-I overexpression induced significant inflammatory cell influx into the lungs, which became evident by day 7 and persisted until day 42. neutrophils were the predominant infiltrating cells in early stages and lymphocytes were predominated in late stages. However, the total collagen content in the AdIGF-I transduced mouse lungs did not change throughout all five time points.

CONCLUSION. Adenovirus-mediated IGF-I overexpression in C57BL/6 mouse lungs induced a significant and prolonged inflammatory response in the lungs but did not induce pulmonary fibrosis.

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0045

MECHANICAL VENTILATION WITH HIGH TIDAL VOLUME INDUCES INFLAMMATION IN PATIENTS WITHOUT LUNG DISEASE

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INTRODUCTION. Experimental and clinical data support that small tidal volumes are associated with reduced injury when the lungs are acutely compromised. However, there is some evidence that ventilation can also damage normal lungs. The aim of the study was to compare the effects of a protective (6 ml/Kg) versus a conventional (12 ml/Kg) ventilatory strategy, on systemic and in lung production of tumor necrosis factor α (TNFα) and interleukin-8 (IL-8) in patients without lung disease.

METHODS. Patients were randomly assigned to ventilate with tidal volume (VT) of 10-12 ml/kg ideal body weight (high VT group) or with VT of 5-7 ml/kg ideal body weight (low VT group) with an O2 inspiratory fraction (FIO2) enough to keep SaO2 > 90% with PEEP of 5 cmH2O during 12 hours after admission to the study. 20 patients without acute or chronic lung disease mechanically ventilated for at least 12 hours were enrolled in one trauma and one general adult ICU. Exclusion criteria were acute lung disease, COPD or structural lung disease. Blood samples for TNFα and IL-8 were taken before the procedure and 12 hours later. Simultaneously, a bronchoalveolar lavage (BAL) was also performed to obtained TNF-a and IL-8 from the lungs.

RESULTS. TNFα and IL-8 concentrations were measured in the blood and in the BAL at admission and after 12 hours of study observation time. At admission or after 12 hours there were no differences on blood TNFα and IL-8 between the two groups. BAL TNFα increase in the high VT group and decrease in the low VT group (p=NS). BAL IL-8 values increased in the high VT group and became greater than in the low VT group (41.00[10.50-210.00] pg/ml vs. 327.95[50.00-1000.00] pg/ml; p=0.016).

CONCLUSION. A high VT strategy may induce mechanical ventilation lung injury even in normal lungs.

REFERENCE(S). 1. Wrigge H, Zinserling J, Stuber F, von Spiegel T, Hering R, Wetegrove S, Hoeft A, Putensen C. Effects of mechanical ventilation on release of cytokines into systemic circulation in patients with normal pulmonary function. Anesthesiology, 2000;93:1413-1417.
2. Ranieri V M, Suter P M, Tortorella D, DeTullio R, Dayer J M, Brienza A, Bruno F, Slutsky AS. Effect of mechanical ventilation on inflammatory mediators in patients with acute respiratory distress syndrome. JAMA, 1999;282:54-61.

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Poster Sessions
Weaning from mechanical ventilation 0046-0059

0046

FORCED OSCILLATION TECHNIQUE AS A NON-INVASIVE METHOD FOR PREDICTION OF WEANING SUCCESS

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INTRODUCTION. Prediction of success/failure in the process of weaning a patient from mechanical ventilation is difficult. It has recently been suggested that repeated measurements of the esophageal pressure swings (ΔPes) during the weaning trial could be useful in predicting weaning. However, application of this method in clinical routine could be limited because measurement of ΔPes is invasive. ΔPes indirectly reflects the magnitude of patient respiratory impedance, which can be non-invasively measured using the forced oscillation technique (FOT). The aim of this study was to analyse the feasibility of FOT for monitoring respiratory resistance (Rrs) over the course of a trial of weaning.

METHODS. We examined 9 patients who were ready to undergo a weaning trial. A trial of spontaneous breathing was initiated through a conventional T-piece connected to the endotracheal tube. FOT (5Hz, $\pm$ 1 hPa, 30 s) was applied at 0, 5, 10, 15, 20, 25 and 30 min. Inspiratory Rrs was computed from pressure and flow measurements. The flow-dependent non-linearity of the endotracheal tube was corrected.

RESULTS. Rrs could be assessed in 60 out of 63 measurement points. Rrs was 11.3 $\pm$ 6.6 and 14.7 $\pm$ 11.3 cmH2O s/L (m $\pm$ SD) at 0 and 30 min, respectively. However, the difference did not reach statistical significance. In 6 patients Rrs varied little during weaning but in 3 patients Rrs increased >85%

CONCLUSION. FOT is applicable to non-invasively monitoring respiratory mechanics during weaning. These preliminary data suggest that FOT may be useful to predict weaning success.

REFERENCE(S). Jubran et al. Am J Respir Crit Care Med, 171: 1252-9, 2005.

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0047

N-TERMINAL PRO BRAIN NATRIURETIC PEPTIDE (NT-PRO-BNP) AND WEANING FROM MECHANICAL VENTILATION (MV)

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INTRODUCTION. Increased levels of brain natriuretic peptide (BNP) and NT-proBNP have been successfully used to identify the presence of left ventricular (LV) dysfunction in patients presented to emergency department (ED) with dyspnea (1). Unsuspected LV is one of the factors responsible for failure to wean from MV. In our study we tried to establish if the NT-proBNP is a useful marker to identify patients, who would fail weaning from MV.

METHODS. A prospective study was conducted in a medical intensive care unit (MICU) over 5 months. Patients, who had been on MV for more than 48 hours and who met the weaning criteria were enrolled in the study. The serum levels of NT-proBNP were measured at the onset of the weaning trail. Information about patients' demographics, clinical diagnosis (as assigned by the treating physician), ejection fraction (EF) and serum creatinin was collected. Failure to wean was defined as inability to extubate or the need to re-intubate the patient next 24 hours. The multivariate model used for the satistical analysis included EF, creatinin, levels of NT-proBNP and the results of the weaning trail.

RESULTS. 51 patients were enrolled in the trail: 24 male (47.1%), 27 female (52.9%); age 68.21 (0.4-5.7); days on mechanical ventilation 4.05 (2-14); results of weaning successful 38 (74.5%), unsuccessful 13 (25.5%). We identified 17 patients with cardiac dysfunction. 16 (94.1%) of them had NT-proBNP above 1400 pg/ml. compare to 20 (58.8%) of the patients without clinically established cardiac dysfunction (p=0.009). Multivariate analysis did not show any correlation between creatinin, EF and weaning outcome. The correlation between weaning outcome and NT- proBNP for the entire group was not statistically significant (p=0.65). The subgroup analysis for the patients with cardiac dysfunction, established statistically significant correlation between the weaning outcome and NT-proBNP levels (p=0.03). Mean levels of NT-proBNP, for the patients with cardiac dysfunction, who did not fail weaning were 11784.52 pg/ml. and 33398.66 pg/ml. for those who failed.

CONCLUSION. Our study conformed the usefulness of NT-proBNP as a marker of cardiac dysfunction. We found evidence that elevated levels of NT-proBNP can predict weaning failure in patients with cardiac dysfunction.

REFERENCE(S). A. Maisel et al; Rapid measurement of B-type natriuretic peptide in the emergency diagnosis of heart failure. N Engl J Med, Vol 347, p. 161.

0048

SUCCESSFUL VERSUS DELAYED EXTUBATION

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INTRODUCTION. Successful extubation from Mechanical Ventilation (MV) is the primary goal when a tube is removed from the patient airway; however it is not always reached, there are a 25% of patients that have respiratory failure after extubation and need reinstitution of ventilatory support [1]. Clinical predictors of these unsuccessful extubations had been studied but results vary. Our objective was to determine failed extubation rate and possible predictor of this failure.

METHODS. From March 2005 to January 2006 we prospective recorded clinical data of all mechanically ventilated patients in the Intensive Care Unit (ICU) of the ABC Medical Center. Patients were extubated using traditional ICU procedure, employing physician attendant judgment on the basis of clinical stability, frequency/tidal volume rapid index > 105 and inspiratory pressure. We analyzed successful and failed extubations looking for associated factors of such failure. The study was accepted by Ethic Committee. Statistical Analysis: A normality test was performed, showing a non normal distribution in at least one of the branches of population for every numeric variable, so data was summarized using median and interquartile interval; nominal variable using frequency and percentage, comparisons between groups using: Mann-Whitney U test and Fisher exact test, statistical significance was reached with a P value less than 0.05.

RESULTS. On the study period, 687 patients were admitted to ICU, 191 were registered episodes of MV, but only 174 (25.3%) were new invasive ventilation episodes, 127 (73%) were extubated and a 27% were not extubated because they were transferred or died during MV. Of extubated patients 118 (92.9%) were success, 9 (7.1%) were failed extubations. This 7.1% seems to be lower to previous reports. Patients who failed after extubation required reintubation or non invasive ventilation, these patients had more smoking habit and more Chronic Obstructive Pulmonary Disease (COPD), lower Glasgow score at ICU admission, were more tracheostomized, and had longer ICU and hospital length of stay. Other clinical characteristics were similar to the successful group.

CONCLUSION. Our unsuccessful extubation rate is lower to previous published. Associated factors to failure are smoking habit, COPD comorbidity and neurological impairment.

REFERENCE(S). 1) Tobin MJ. Advances in Mechanical Ventilation. N Engl J Med 2001; 344(26):1986-1996

0049

ESTIMATION OF WORK OF BREATHING THROUGH BREATHING PATTERN VARIABILITY DURING PRESSURE SUPPORT VENTILATION (PSV)

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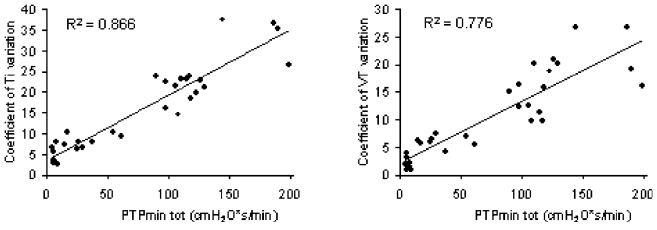
INTRODUCTION. Breathing pattern variability, a physiological hallmark of spontaneous breathing, should ideally be preserved during PSV. However, if patient's ventilatory drive and work of breathing spontaneously decrease, once triggered the ventilator could passively inflate the patient (over-assistance). We tested the hypothesis that during PSV breathing pattern variability could be correlated with work of breathing.

METHODS. 8 patients ventilated with PSV were studied. For each patient, 4 periods of 5 min each, randomly collected in a period of 4 hours, were considered. During each period, both the coefficient of variability (CV = standard deviation * 100/mean) for inspiratory time (Ti) and tidal volume (VT) and the mean pressure time product of transdiaphragmatic pressure per min (PTP/min) were evaluated. The overall correlation between CV and PTPmin was evaluated.

RESULTS.



CONCLUSION. Measurement of Ti and VT variability could be a simple method to estimate patient's work of breathing during PSV.

0050

PREDICTING SUCCESS IN WEANING FROM MECHANICAL VENTILATION: INITIAL RESULTS FROM A MULTICENTRIC STUDY

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INTRODUCTION. Failure in weaning from mechanical ventilation (MV) is frequent (25-30%) and associated with high mortality. Indexes predicting success can be helpful clinically. However their predictive capacity can be low. The goal from this study is to evaluate weaning predictor indexes in patients during weaning from MV.

METHODS. Patients under MV for at least 48 hours, submitted to spontaneous breathing trial (SBT) for 30 min, extubated according to assistant physicians decision and followed for 48 hours, were included. They were evaluated concerning age, sex, clinical caracteristics, length of hospital and ICU stay, time of MV. At first and 30th minutes from SBT there were analyzed: arterial blood gases, hemodynamic parameters, respiratory parameters as respiratory rate (RR), tidal volume (VT), rapid shallow breathing index (f/VT), maximal inspiratory and expiratory pressures. Comparisons were done between two groups of patients: success versus failure, defining failure as return to MV in the first 48 hours.

RESULTS. 294 patients were studied. Overall mortality rate was 15%. Return to mechanical ventilation occurred in 25%. The most important differences comparing success with failure groups were: lower age (57±19 X 63±17 years, p<0.05), lower mortality rate (9% X 32%, p<0.001), shorter length of ICU stay (14±11 X 20±15 days, p<0.001); less incidence of dyspnea (32% X 54%, p<0.001), higher oxygen saturation at 30th min (96±3% X 94±4%, p<0.01), lower RR at first and 30th min (24±6 X 26±6 bpm, p<0.05, and 24±6 X 28±8 bpm, p<0.001), higher VT at 30th min (510±160 X 440±170 ml, p<0.01), lower f/VT at first and principally in the 30th min (57±27 X 65±30, p< 0.05 and 55±33 X 80±56, p<0.001).

CONCLUSION. In this group of patients a great number failed in the weaning process showing, as expected, a higher mortality rate. Parameters related to failure were higher age, longer ICU stay, higher incidence of dyspnea, higher RR and f/VT at the beginning and, principally, the end of the trial, lower VT and oxygenation at the end of the trial.
Other members from the study: LGBorges, FCallefe, KBPinto, KHartmann, CEHahn, LCassel, MBBlom, RZancanaro, PPinheiro, RCremonesi, TFTonietto, ESOliveira, JBHervé, SFMBrodt, FAlves, MEAlves, ACTSilva, RCondessa, JHorer, NBSilva.

0051

USEFULNESS OF A WEANING AND REHABILITATION CENTER FOR RECENTLY VENTILATED DEPENDANT PATIENTS

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INTRODUCTION. In our medical ICU we recently created a Weaning and Rehabilitation Center (WRC), in order to treat new dependencies (i.e. respiratory, nutritional, physical etc.) developed during ICU hospitalisation which prevent transferring patients to a conventional ward.

METHODS. In 2005, at our six bed unit, we were able to treat 29 patient transfers as regards mechanical ventilatory dependence acquired during ICU hospitalisation, either from our hospital ward or another ICU. Patients were separated into three categories: chronic obstructive pulmonary disease (COPD), peripheral neuromuscular dysfunction (PNMD) and moderate central nervous system involvement (CNSI). SAPS II score, ICU and WRC length of mechanical ventilation (MV), weaning MV and weaning tracheotomy sucess were used for between-group comparisons.
The results in tracheotomy and MV weaning led us to create three groups: group 1=stop MV and tracheotomy; group 2=stop MV (if COPD, not more than twelve hours per day) and group 3=MV (if COPD, MV>12 h/d) or dead. We compared the variables using Fisher's test for qualitative variables and Mann-Whitney test for quantitative variables, a value of p< 0.05 was considered significant.

RESULTS. Death (one patient in each group) or persistent MV occured in 9 (31%) patients. In PNMD population, sucess in weaning of tracheotomy (p=0.007) and MV (p=0.009) was significantly higher than in the two other categories.

TABLE 1.

	ICU SAPS II	ICU length of MV (d)	UWR length of MV (d)	Weaning of tracheotomy	group 1 N (%)	group 2 N (%)	group 3 N (%)
COPD (N=12)	37 ± 19	36 ± 31	42 ± 52	0 (N = 9)	0	6 (50%)	6 (50%)
PNMD (N=10)	49 ± 20	33 ± 18	14 ± 14	8	9 (90%)		1 (10%)
CNSI (N=7)	33 ± 14	29 ± 28	29 ± 32	2	2 (29%)	3 (43%)	2 (29%)

CONCLUSION. WRC permits effective care and favorable evolution for selected patients coming from an ICU.

0052

WEANING MANAGEMENT AND OUTCOMES IN AN AUSTRALIAN INTENSIVE CARE UNIT

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INTRODUCTION. Trained ICU nurses are in an excellent position to manage the weaning process however their role is poorly described.

METHODS. A prospective 3-month audit of weaning methods and related clinical decisions was conducted in a 24 bed, adult ICU in an Australian university-associated hospital.

RESULTS. Of the 319 patients receiving mechanical ventilation, 128 patients (40%) post cardiac surgery were excluded from analysis (due to expected short ventilatory requirements), leaving 191 (60%) with medical, surgical or trauma diagnoses. Their median duration of ventilation was 1.8 days, of which 1.2 days (67%) was taken up with weaning. Death before weaning commenced occurred in 13 (7%) patients and during weaning in 15 (9%) patients (1 after reintubation). Of the 178 patients who underwent weaning, 145 (76%) patients were successfully weaned, 19 (10%) patients required reintubation.
The majority of patients (66%) were weaned by a rapid transition from a volume or pressure controlled mandatory mode to pressure support ventilation with no other reduction of support. Within the context of an ICU management plan, an ICU nurse initiated the onset of weaning in 135 (76%) of the 178 patients. During weaning, 2292 decisions were identified (defined as any adjustment of ventilator settings during the weaning phase). Of these decisions, 1335 (58%) were made by nurses and a further 490 (22%) were made collaboratively between ICU nursing and medical staff. In all weaning decision categories, the proportion of nursing initiated alterations to ventilator support were >50% except PEEP adjustment (44%). In patients with predominantly respiratory disease and in those with multiple organ dysfunction, exclusively nursing decisions were less common (table). Decision making, for these patients, was more collaborative in nature.

TABLE 1.

	Nurse decision n/N	% (95%) CI	Odds ratio (95%CI)	P value
Reason for ventilation, Coma	668/1044	64 (61-67)	1	-
COPD	10/54	19 (9-31)	0.13 (0.06-0.26)	<0.001
Post op	207/410	51 (46-55)	0.57 (0.46-0.72)	<0.001
Pneumonia	160/311	51 (46-57)	0.6 (0.46-0.77)	<0.001
Trauma	145/265	55 (49-61)	0.68 (0.52-0.89)	0.006
Sepsis	47/66	71 (59-82)	1.39 (0.81-2.41)	0.24
Other	85/120	71 (62-79)	1.37 (0.9-2.07)	0.14

Categories based on Esteban et al. (2000). Those with low no. of decs not reported

TABLE 2.

	Nurse decision n/N	% (95% CI)	Odds ratio (95% CI)	P value
SOFAmax > or = to 12	585/1026	57 (54-60)	1	-
<12	750/1266	59 (56-62)	1.10 (0.93-1.29)	0.28

CONCLUSION. Within this setting, experienced nurses have a high level of responsibility for, and autonomy in, the management of weaning resulting in acceptable durations of ventilation and weaning outcomes.

REFERENCE(S). Esteban A, Anzueto A, Alia I, et al. Am J Respir Crit Care Med 2000;161(5): 1450-8.

0053

CLINICAL WEANING SCORE ON SUCCESS EXTUBATION FROM MECHANICAL VENTILATION

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INTRODUCTION. Liberation from mechanical ventilation still consumes substantial medical effort. From the clinical point of view, only the rapid shallow breathing (RSB) index is generally accepted (1), and maybe clinical decision should be explored deeper besides numeric parameters. According to our hypothesis, clinical "Weaning Score (WS)" should be included on the spontaneous breathing ability protocol (SBAP). Aim: To predict success extubation or return to mechanical ventilation based on WS.

METHODS. We did a prospective observational research study on Seventy one critical ill patients. When the patient was enrolled in the study, SBAP was checked by switching the ventilator (Galileo, Hamilton Medical AG.) from full ventilatory support to CPAP 5 cmH2O, Pressure trigger was set at 0.5 cmH2O, and PS 7 cmH2O. Automatic tube compensation was not used. Patients were evaluated according to WS on the first 10 min (1 point for each item): Agitation, diaphoresis, anxiety, somnolence, breathing pattern, secretions, cough capacity, patient acceptance of extubation, nasal flaring, and head up capacity. Final aim was reintubation and return to mechanical ventilation. Before the decision of extubation patient was evaluated by the intensivist and patient was extubated. Statistics: A validation of the data was used to assess the ability to the new WS to predict weaning outcomes such us re-intubation or return to mechanical ventilation, based ROC analysis. SPSS 10 was used and $p < 0.05$ was considered significant.

RESULTS. Seventy one patients were studied, 46.5% were male and 53.5% were female. Their average age was 48.7±21.6 years. APACHE II 15.8±8.07. The overall mortality rate was 10.7%, and death of re-intubated patients was 18.8%. 81.7% of patients were CMV before start SBAP.

TABLE 1.
Statistics significant dates.

	Return to Ventilation 25.4%	Re-Intubation 15%	Death 10.7%
WS	>3	>2	>4
AUC (CI 95%)	0.9 (0.79-0.96)	0.51(0.39-0.63)	0.73 (0.60-0.83)
p	0.0001	0.90	0.058
Se / Sp	93.3 / 88.6	63.6 / 55	50 / 91.1
+ LR	8.21	1.41	5.6
- LR	0.08	0.66	0.55
+ PV	73.7	20.6	– –
- PV	97.5	89.2	– –

CONCLUSION. Clinical decision has not been explored on the set of weaning. According to our findings, weaning is still depending on clinical assessments and the "art" of weaning is related with clinical score. Besides of mathematical indexes a WS should be included on the first 10 mins of SBAP. Finally, WS not only allow to make a difference of predictor indexes according to type of pathology such us thorax trauma, poisoning, head trauma, and COPD, but also may reduce re-intubation and mortality.

REFERENCE(S). 1) CCM 2005; Suppl.33(12); A119. 2) AJRCCM 2005;171:1252-1259.

0054

POST-OCCLUSIVE REACTIVE HYPEREMIA IN WEANING FAILURE MONITORED BY NEAR-INFRARED SPECTROSCOPY

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INTRODUCTION. We hypothesized that the cardiovascular impairment during weaning failure from mechanical ventilation (MV) may also be reflected in microcirculation. We used the noninvasive near-infrared spectroscopy (NIRS) technique as a tool for assessing the microcirculation impairment.

METHODS. We studied 41 mechanically ventilated patients (pts) during a 2-hour T-piece weaning trial. Weaning trial was defined as successful when the pt was able to sustain spontaneous breathing (SBT) without distress. Oxygenation, respiratory rate (RR) and minute ventilation (VE) were measured before and either at 2 hours after disconnection from MV in pts with successful SBT, or at the time of reconnection in those with a failed one. Thenar muscle oxygen saturation (StO2) was monitored by NIRS, at the same time points, by the arterial occlusion method. Hyperemic Response parameters, the ratio of the max value of StO2 after the release of arterial occlusion to its min value during arterial occlusion (HRmax) and the maximal change of StO2 during the phase of reactive hyperemia, were measured.

RESULTS. Twenty-one pts were successful and 20 failed during their weaning trials. SaO2, RR and VE on MV did not differ between the two groups. During weaning trial, SaO2 was decreased in the failure group (FG) from 98.1 to 87.9%(p<0.001), and the frequency/tidal volume (f/TV) index was increased from 30 to 214 breaths/L(p<0.001). During weaning trial, in the successful group (SG), SaO2 changed from 98.6 to 96.2%(p=0.002) and f/TV index increased from 31 to 79 breaths/L(p<0.001). At the end of SBT, HRmax was significantly different between two groups, FG 26.33 and SG 52.27(p=0.047), and it was increased to 52.27 in the SG (p=0.013) while it did not change significantly in FG. On MV the maximal change of StO2 during reactive hyperemia was not different between the two groups, while at the end of SBT it was significantly different between the two groups FG 66.0 and SG 70.95(p=0.04).

CONCLUSION. These data indicate that a microcirculation impairment in pts who fail to wean from MV may occur. Further study is needed to define the hyperemic response parameters provided by the NIRS technique and their role, as well as to assess the microcirculation impairment in weaning failure.

0055

EXTUBATION FAILURE: INCIDENCE AND EPIDEMIOLOGY

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INTRODUCTION. Despite more recent advances in respiratory monitoring and ventilatory weaning, up to 20% of extubated patients need early return to invasive mechanical ventilation (IMV). Therefore, the prediction of success of this procedure is still a challenge. OBJECTIVES: To describe the incidence and epidemiological aspects of patients which had extubation failure (EF) in a general adult ICU.

METHODS. This was a 09 months retrospective cohort study. EF was defined as a need to return to IMV after a period lesser than 48h after extubation (or 96 h when non-invasive ventilation was used after extubation). Already tracheostomized patients or non-planned extubation were excluded. It was used descriptive statistics and comparison with univariated analysis of variance (anova), with T-test.

RESULTS. During studied period, 83 patients were extubated (72.3% male; average age=47.3); of this total, 07 had EF (8.43%). One patient had 03 episodes of EF. Among patients with EF, average length of MV before extubation was 5.43 days (01-10). Average age=47.3; Male gender=57.1%; APACHE II=17.6. Main admission causes were: Trauma / Fire Gunshot: 57.2%; Sepsis: 28.4%; Exogenous intoxication: 14.4%. More common previous diseases were alcoholism and arterial hypertension. Only 01 patient had COPD. All patients used SIMV (with PSV) + spontaneous respiration test with T-tube. Enteral nutrition was properly done for 85.7% of the patients, with an average of 1432 ml/day before extubation. After EF, 01 patient (14.3%) had well-succeeded extubation, and in 04 patients (57.1%) tracheostomy was made, with later liberation from mechanical ventilation. ICU mortality was 28.6%.

CONCLUSION. The incidence of EF was high, and it is closely related with worse outcomes.

0056

BNP AND WEANING FAILURE IN PATIENTS WITH DIFFICULT WEANING

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INTRODUCTION. A suboptimal cardiovascular response may contribute to weaning failure. Brain natriuretic peptide (BNP) is a sensitive marker of impaired myocardial performance, but its prognostic significance in weaning has not been studied. We studied the relationship of BNP to the outcome of a weaning trial in patients with difficult weaning.

METHODS. We studied 29 critically ill patients who had failed in at least one spontaneous breathing trial with T-Piece. Arterial blood gases, heart rate (HR), mean arterial pressure (MAP), central venous pressure (CVP), oxygen saturation in the superior vena cava (ScvO2), BNP, blood lactate were measured at the initiation of the trial (t-in) and at 2 hours (or at reinstitution of mechanical ventilation) (t-fin). Rapid shallow breathing index (RSBI) was measured at t-in. Comparisons were made between patients who succeeded the trial [Group A (n=14)] vs patients who failed [group B (n=15)].

RESULTS. There was a significant difference in RSBI between groups A and B (58.56 ±20.44 vs 91.47±33.17; t-test, p=0.0036) Lactate was increased in group B, at t-in (group A: median 0.8, interquartile range 0.7-1 mmol/lit; group B: median 1.5 interquartile range 1.05-1.95 mmol/lit, p=0.0043) and at t-fin (group A: median 0.8, interquartile range 0.725-1.15 mmol/lit; group B: median 1.6, interquartile range 1.14-1.90 mmol/lit; p=0.0069). No differences in BNP were observed between groups A and B, at t-in [group A:156.5 pgr/ml (median), interquartile range 55.5-810.75 pgr/ml; group B: 535 pgr/ml (median), interquartile range 134-1726 pgr/ml; p=0.10) or at t-fin (Group A: 158.5 pgr/ml (median), interquartile range 66.25-1200.75 pgr/ml; group B: 646 pgr/ml (median), interquartile range 133-1619 pgr/ml; p=0.077). No difference was observed in MAP, HR, CVP, ScvO2. Within the same group no significant difference was observed between t-1 and t-fin in BNP, lactate, CVP, ScvO2. When analysis was restricted to patients with RSBI < 105, no difference in BNP was found between weaning failures and successes.

CONCLUSION. BNP cannot be used as a predictor of weaning failure in unselected critically ill patients.

REFERENCE(S). Joubran A, et al. Am J Respir Crit Care Med 1998; 158:1763-9

0057

OPTIMIZATION OF VENTILATORY SETTINGS AND PREVALENCE OF PATIENT-VENTILATOR ASYNCHRONY

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INTRODUCTION. The prevalence of patient-ventilator asynchrony is high during assisted mechanical ventilation and ineffective triggering is the main asynchrony detected. Patients with frequent asynchronies have a prolonged duration of mechanical ventilation. Asynchrony may be an index of the severity of respiratory status or related to inappropriate adjustment of ventilatory settings. Objective: To evaluate if the optimization of ventilatory settings could reduce the prevalence of asynchronies during pressure support ventilation (PSV).

METHODS. We recorded flow, airway, esophageal and gastric pressure signals using a Fleisch pneumotachograph and a double catheter balloon. Esophageal pressure signal was used to detect asynchronies and to evaluate diaphragmatic energy expenditure, pressure time product (PTP). Ventilatory settings were kept unchanged and then modified step by step. The goal was to eliminate asynchronies without signs of poor tolerance. The steps were: decreasing pressure support level by 2 cmH2O, limiting inspiratory time by increasing cycling off criterion, application of external positive end expiratory pressure (PEEP). This study was performed using AVEA ventilator (VIASYS, USA).

RESULTS. Ten patients ventilated in PSV and exhibiting ineffective efforts were evaluated. Mean pressure support level decreased from 19±2 to 13±2 cmH2O, which allowed to reduce the frequency of ineffective triggering from 39±14% of respiratory efforts to 8±15%, p<0.01. Although respiratory rate indicated by the ventilator increased from 16±5/min to 24±5 (p<0.01), the true patient's respiratory rate remained unchanged from 28±8/min to 30±7 (p=0.15). The PTP slightly increased from 50±23 to 72±32 cmH2O.s/min (p<0.01) but remained below an excessive workload, and PCO2 remained stable, 47±11 mmHg versus 45±11 (p=0.23). Reduction of inspiratory time also allowed to reduce the frequency of ineffective triggering to a lesser extent (14±18%, p<0.01) without increase of diaphragmatic energy expenditure. Application of PEEP had no influence on the prevalence of asynchronies (33±22%, p=0.53).

CONCLUSION. Reduction of pressure support level or shortening of inspiratory time can reduce the frequency of ineffective triggering during PSV, without inducing an excessive work of breathing and without modify the true patient's respiratory rate and alveolar ventilation.

0058

AN ULTRASONOGRAPHIC STUDY OF THE DIAPHRAGMATIC CONTRACTION IN HEALTHY VOLUNTEERS

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INTRODUCTION. The ultrasonographic study of the diaphragmatic movement is a painless, hazardless and easily reproducible method. It has been found that there is an excellent correlation between the distance of the diaphragmatic movement assessed by ustrasonography and the tidal volume. By using the same acoustic window and the software of modern ultrasound devices we can obtain highly reliable measurements of the distance of the diaphragmatic movement (D), the inspiratory time (Ti), expiratory time (Te) and the mean velocity of diaphragmatic contraction during inspiration (V).

METHODS. By means of ultrasound (ACUSON 128XP, probe 3.5Mhz) on M-mode, we studied the real-time diaphragmatic movement in 10 healthy volunteers, aged 32±4 yrs during normal quiet breathing in semi-recumbent position and after applying external inspiratory resistances (R=25 cmH2O.lit-1.sec-1) as well as a weight on the chest (4kg) and the abdomen (3kg) in order to reduce chest wall compliance. On each occasion the following parameters were recorded on M-mode: D, Ti, Te and V, during at least 6 representative respiratory cycles. ANOVA statistical analysis was used to compare the values under the three different conditions of the study described above.

RESULTS. The results of the study are shown in table 1.

TABLE 1.

	D (mm)	Ti (sec)	Te (sec)	V (mm.sec-1)
Quiet breathing	16 ± 5	1.3 ± 0.3	1.3 ± 0.5	12 ± 4
Low chest wall compliance	14 ± 5	1.6 ± 0.3	1.5 ± 0.6	9 ± 4
High inspiratory resistances	11 ± 3	1.6 ± 0.3	1.5 ± 0.5	7 ± 3
p	<0.05	<0.05	NS	<0.05

CONCLUSION. In healthy volunteers, by means of ultrasonography we were able to record and analyze the reduction of the diaphragmatic displacement, the increase of the inspiratory time and the decrease of mean diaphragmatic velocity during inspiration induced by the increase of respiratory resistances and the decrease of chest wall compliance.

0059

ULTRASONOGRAPHY OF THE DIAPHRAGM: A NEW APPROACH IN THE STUDY OF PATIENT - VENTILATOR INTERACTIONS

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INTRODUCTION. The study of diaphragmatic contraction in the ICU is mainly based on recording esophageal or transdiaphragmatic pressure. We used and evaluated the ultrasonography of the diaphragm as a means of assessing diaphragmatic contraction in patients under mechanical ventilation.

METHODS. By means of ultrasound (ACUSON 128XP, probe 3.5MHz) on M-mode real-time observation, we simultaneously recorded the diaphragmatic motion and the esophageal, transdiaphragmatic or airway pressure in 12 patients under mechanical ventilation. In each diaphragmatic contraction the following values were measured, using the software of the ultrasound unit: the maximum distance of the diaphragmatic movement during inspiration (D), the mean velocity of the diaphragmatic contraction (V), the duration of inspiration (Ti), the duration of expiration (Te) and the total duration of the respiratory cycle (Ttot). Under various levels of pressure support assisted breathing we assessed the possibility of identifying the presence of auto-PEEP (as defined by a time delay between the beginning of the diaphragmatic contraction and the beginning of airway pressure rise), the counterbalance of intrinsic PEEP by externally applied PEEP as well as the presence of missing inspiratory efforts based on the esophageal, transdiaphragmatic and airway pressure alterations.

RESULTS. In all occasions, the beginning of the diaphragmatic contraction, as assessed by ultrasonography, was timed to the beginning of esophageal or transdiaphragmatic pressure change. All cases of missing inspiratory efforts, as well as the distance of "wasted" diaphragmatic movement were easily identified by ultrasonography. In some patients, 75% of the diaphragmatic contraction was "wasted" in overcoming high levels of intrinsic PEEP, which was also easily identifiable by ultrasonography and simultaneous recording of airway pressures.

CONCLUSION. The ultrasonography of the diaphragm is a different, innovative, non- invasive and easily reproducible bedside method in understanding and evaluating patient-ventilator interactions.

0061

THE IMPACT OF ICU PERFORMANCE AND EMPIRICAL ANTIMICROBIAL THERAPY ON SEPSIS OUTCOME

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INTRODUCTION. Paper evaluated epidemiology of sepsis in medical intensive care unit (ICU), and the impact of ICU performance and adequate empirical antibiotic therapy on survival.

METHODS. Observational, prospective study assessed all patients (pts) meeting criteria for sepsis at admission. Clinical presentation of sepsis was defined according to 2001 International sepsis definitions conference. Demographic and epidemiology data, severity of sepsis, ICU/hospital stay, outcome, performance and appropriateness of empirical antibiotic therapy were analyzed.

RESULTS. The study included 314 (6.3%) pts, predominantly male, median age 71, 176 (56.1%) ICU survivors and 138 (43.9%) non-survivors. The non-survivors were older, with limited mobility and predominantly male ($p<0.001$; $p<0.001$; $p=0.030$). There were more septic pts in the winter ($p=0.013$) with higher death rate ($p=0.002$). Mean length of stay was 6.97 days for ICU, and 15.82 days for hospital. Non-survivors had significantly lower GCS and higher APACHE II and SOFA scores ($p<0.001$ for all), and history of chronic heart ($p<0.001$), and respiratory ($p<0.001$) failure. At the ICU admission sepsis was present in 100 (31.8%), severe sepsis in 89 (28.6%), and septic shock in 125 (39.8%) pts with mortality rates 17%, 33.7%, 72.1% respectively. 244 (77.7%) pts developed at least one organ dysfunction syndrome, out of 138 (43.9%) pts who met criteria for septic shock, 107 (75.4) were non-survivors ($p<0.001$). Microbiological documentation of sepsis was obtained in 235 (74.8%) pts; bloodstream infection was documented in 62 (19.8%), urinary in 65 (20.7%), and respiratory tract infection in 16 (5.1%) pts; 86 (27.4%) had documented infection in bloodstream and focus, and 6 (1.9%) in two different focuses. Positive blood culture rate at admission was 49%, documented presence of bacteria in bloodstream was related to better outcome ($p<0.001$). Urinary tract infections were the most common 168 (53.5%), followed by skin/soft tissue 58 (18.5%), lower respiratory tract 44 (14.0%) and gallbladder/bile ducts 17 (5.4%) infections. Lower respiratory tract as focus of sepsis was connected with worse outcome ($p<0.001$). Empirical antibiotic treatment was considered adequate in 106 (60.5%) survivors and 42 (31.2%) non-survivors, and inadequate in 70 (39.5%) survivors and 96 (68.8%) non-survivors ($p=<0.001$). Patients treated with adequate empirical antibiotic therapy had significantly higher survival time in hospital (log-rank $p=0.0011$).

CONCLUSION. Sepsis syndrome commonly occurs among vulnerable pts, such as elderly and pts with multiple comorbidities. ICU management and performance with aggressive resuscitation of septic pts, and prompt and appropriate empiric antimicrobial treatment is life saving. Severity of illness of this group of pts was underestimated in emergency department, which resulted in time delay in ICU admission that might be fatal.

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0060

WHAT CAUSES THE DEATH IN SEPTIC SHOCK PATIENTS?

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INTRODUCTION. Sepsis remains a major cause of death in intensive care units (ICUs). Despite many advances in the treatment, the mortality associated among those who develop shock remains high. No autopsy studies have revealed why patients with sepsis die. The mechanisms contributing to the development of septic shock are complex, and the ultimate cause of mortality is unclear.

METHODS. A multicenter prospective cohort study was made in 65 hospitals all over Brazil. The patients who were admitted or who developed severe sepsis or septic shock during the month of September, 2003 were enrolled. They were followed until the 28th day and/or until their discharge. The diagnoses were made in accordance to the criteria proposed by ACCP/SCCM. Demographic data, APACHE II score, SOFA (Sequencial Organ Failure Assessment) score and source of infection were evaluated. A survey was done to try to define a clinical cause of death in these patients.

RESULTS. 75 ICUs from all regions of Brazil took part in the study. 265 patients filled the criteria of septic shock. Average age was 64 (41-78) years old, 149 (56.2%) were males, and the overall 28-day mortality rate was 65.3%. Average APACHE II score was 22 (IQR, 17-27) and SOFA score on the first day was 9 (IQR, 6-11). SOFA score increased on day 3 (9.5, IQR 7-12). The main cause of death answered by the attending physician was refractory shock (127 cases, 73.4%). Respiratory failure was the second one, 21 cases (12.1%). A cardiac etiology was related in only 04 cases as the major cause of death.

CONCLUSION. The exact cause of death in patients with septic shock remains elusive. In this study the intensivists made a strong correlation between refractory shock and death.

0062

EARLY SEPTIC SHOCK IS ASSOCIATED WITH POOR OUTCOME

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INTRODUCTION. To determine the differences between early and late septic shock on the outcome of patients admitted to intensive care unit (ICU).

METHODS. All the charts of patients admitted for septic shock during a two-year period were retrospectively assessed. The patients with a septic shock on admission (24 hours) were considered as "early", and those with a septic shock occurring later than 24 hours after admission were considered as "late". Results are expressed as percentage or mean (SD).

RESULTS. Among 95 episodes of septic shock, 83 were considered as early and 12 as late. At baseline, the two groups of patients were similar (Table I). Hospital mortality (64 vs 25%, P = 0.008) and duration of shock (67 (102) h versus 65 (96) h, P = 0.04) were significantly higher in the patients with an early septic shock than in those with a late septic shock. Duration of hospitalization was longer in the "late" group compared with the "early" (P = 0.001), but this difference was related to the survivors since after exclusion of patients who died during their ICU stay, the duration of hospitalization was then longer in the "early" group (P = 0.002).

TABLE 1.

	Early (n = 83)	Late (n = 12)
Age (yrs)	61 (16)	61 (16)
SAPS II	52 (21)	58 (21)
Lactate (mmol/l)	5.1 (4.3)	5.3 (4.8)
SvO2 (%)	71 (14)	69 (15)
Creatinine (μmol/l)	177 (113)	175 (120)
Fluid resuscitation (l/24 h)	6.1 (1.3)	5.9 (1.0)
Norepinephrine (μg/kg/min)	0.9 (0.8)	1.0 (0.9)

Table 1. Characteristics at the onset of shock

CONCLUSION. Our results confirm those obtained in a prior study (1). An overmortality is associated with the occurrence of an "early" septic shock". In the present study, however, severity of patients was similar at the onset of septic shock, while morbidity in the "early" group is higher than in the "late" group. We hypothesize that the patients admitted to ICU with an "early" septic shock experience a delay in their management regarding the goals recommended by the "Surviving Sepsis Campaign".

REFERENCE(S). 1. Roman-Marchant O, et al. Chest 2004;126:173-8.

0063

EVIDENCE BASED APPROACH TO SEVERE SEPSIS: A NATIONAL SURVEY

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INTRODUCTION. Severe sepsis is an important cause of mortality and morbidity in the Intensive Care Unit (ICU). International, evidence-based guidelines have recently been developed to improve management (1). However, gaps are known to exist between published evidence and clinical practice (2). We examined the perspective of United Kingdom (UK) ICU physicians on the evidence for key strategies in the management of patients with severe sepsis/septic shock, and factors that influence their implementation.

METHODS. A questionnaire was designed to assess physician perceptions of 12 interventions from the Surviving Sepsis Campaign (SSC) Guidelines. Respondents used Likert scales to grade each intervention on the quality of supporting evidence, potential clinical benefit and clinical harm, and ease of implementation. Following sensibility testing, the questionnaire was distributed to all ICU lead clinicians in the UK. Responses were converted to nominal categories then analysed using the Chi-squared test (EpiInfo6; CDC, Atlanta).

RESULTS. The estimated prevalence of severe sepsis exceeds that reported in the literature in most (63%) units surveyed. Respondents agreed with the published rating of evidence supporting the 12 interventions on only 51% of occassions. There was no association between SSC designated grades of evidence and clinicians self-reported practice. Use of the interventions was associated with physicians' perception of the strength of evidence (OR 2.84), clinical benefit (OR 4.46) or harm (OR 0.18), and ease of implementation (OR 5.0) ($p<0.001$ for each). A non-significant association was seen between resource allocation and perceived level of evidence (OR 1.4, $p=0.07$) and clinical benefit (OR 1.4, $p=0.07$).

CONCLUSION. UK ICU physicians show relatively poor agreement with the published rating of evidence supporting recent international guidelines for severe sepsis/septic shock. Other factors, including clinical risk/benefit and barriers to implementation, directly influenced physicians willingness to adopt these recommendations. Guidelines alone are unlikely to be successful, and other strategies will be needed to improve the management of such complex patients.

REFERENCE(S). (1) Dellinger et al. Crit Care Med, 2004; 32:858–873 (2) Cook DJ et al. Crit Care Med, 2002;30(7):1472-7.

0064

VENTILATION THERAPY IN SEPTIC PATIENTS IN GERMANY - RESULTS FROM THE SEPNET PREVALENCE STUDY

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INTRODUCTION. Mechanical ventilation plays an important role in the management of patients with severe sepsis or septic shock because it is known that mechanical ventilation itself can induce lung injury. Lung protective mechanical ventilation (LPV) with low tidal volume, early assisted spontaneous breathing and peak pressures lower than 35 cm H_2O is supposed to reduce the ventilator-induced damage to the lung tissue. This study was designed to find out how the present recommendations on the employment of LPV are applied in Germany.

METHODS. In the "Prevalence of severe sepsis and septic shock in Intensive Care Units in Germany" study, a prospective observational cross-sectional study, data from 454 ICUs in 310 randomly selected hospitals in Germany were collected by local one-day visits of trained physicians from SepNet's 17 regional study centers. The following data were analyzed: type of ventilation, mode of mechanical ventilation, standardized tidal volume and peak airway pressure.

RESULTS. In a cohort of 415 patients, 16.4% did not need mechanical ventilation, 3.6% were non-invasively ventilated, 50.4% were intubated and 25.8% were tracheotomized. (In 3.8% of patients no data was given). Volume-controlled ventilation was used in 7.6% of patients, 69.9% of patients were ventilated in the pressure-controlled mode and 21.5% were allowed to breathe spontaneously in assisted mode (In 0.9% of patients no data was given). The tidal volume was 10.1 ± 2.5 ml/kg body weight (mean $\pm$ SD) and peak airway pressure was 27.8 ± 6.6 cm H_2O (mean $\pm$SD).

CONCLUSION. The results of our study show that the novel findings and recommendations regarding the use of LPV have only in part been applied in clinical practice. The majority of patients were ventilated in the pressure-controlled mode at acceptable airway pressures, however, with relatively high tidal volumes. In view of the current knowledge on the mechanisms of development of ventilator-induced lung injury, LPV should play a key role in the therapy of septic patients which is not yet the case in Germany.

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0065

CLINICAL SIMULATION: CARING FOR A CRITICALLY ILL PATIENT WITH SEPSIS

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INTRODUCTION. The purpose of this simulation research was to assess whether bedside nurses could better apply currently recommended therapeutic interventions for patients with sepsis by using a horizons trends clinical decision support tool, rather than just standard monitoring screen shots alone.

METHODS. Simulation research participants (N=50) were first required to attend a didactic training session focusing on recognition and evidence-based treatment for critically ill patients with sepsis. Participants were then directed to apply these treatments in a simulated sepsis experience. Data were collected at 2 sites (AACN National Teaching Institute Critical Care Nursing Conference, New Orleans, May 2005 and Long Beach Memorial Medical Center's Health Skills Education Center). A METI HPS (human patient simulator) was connected to a Philips Medical Systems Intellivue MP 70 in a simulated critical care environment. Participants were given the patient history, and completed the rest of their assessment using the HPS and Intellivue patient monitoring. Data were collected to compare the use of bedside monitor displays with and without horizon screen trends in the care of patients with sepsis. Group 1 (N=26) completed the sepsis scenario using a standard screen display, and group 2 (N= 24) had the addition of horizon trends on the display.

RESULTS. The point that marked the onset of sepsis was when each of the physiologic parameters met the current evidence-based screening criteria being disseminated by the Surviving Sepsis Campaign. The mean time for initiation of every therapeutic decision point was shorter in Group 2 (the horizons screen group) than in Group 1 (the standard screen group). There was a 32% reduction in time to sepsis recognition, an 8% reduction in time to initiation of fluid bolus, a 22% reduction in time to initiation of vasopressor therapy, and a 6% reduction in time to get diagnostic blood cultures.

CONCLUSION. While the number of participants was too low to reach statistical significance, results of this pilot study potentially support the hypothesis that the use of horizons screen trends assisted the clinicians in making more rapid clinical decisions.

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0066

AN ADVANCED RESUSCITATION ALGORITHM FOR SEVERE SEPTIC SHOCK (ARAS) IMPROVES SURVIVAL

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INTRODUCTION. There is wide variation on clinical management of septic shock (SS) and the need to protocolize it has been emphasized. We recently implemented a Norepinephrine (NE) driven algorithm (ARAS-1) with a global survival of 67%, but a very high mortality (63%) on the most severe subset of patients (NE requirement $>$ 0.3 ug/kg/min for MAP $>$ 70 mmHg) [1]. New therapies with different levels of evidence have been proposed (steroids, drotrecogin alpha activated (DrotAA), high-volume hemofiltration (HVHF)). We amended our protocol incorporating them in sequential steps according to shock severity (i.e. NE requirements) and applied it prospectively (new algorithm ARAS-2). We decided to compare results and outcome of these 2 protocols in a population of severe SS patients.

METHODS. We made a retrospective analysis of two prospective databases. All adult patients with severe SS were enrolled consecutively and managed according to hemodynamic algorithms based on NE in two periods: (a) 2002-3, (b) 2004-05. ARAS-2 incorporates new therapies, multidisciplinary evaluation for every patient, HVHF for intractable shock [2], and pursues normalization of metabolic perfusion parameters (lactate, SvO2).

RESULTS. Thirty-three patients on ARAS-1 and 33 on ARAS-2 were evaluated with no statistical difference on baseline demographic data, APACHE II (22.2 ± 7.1 vs. 22.4 ± 6.6), SOFA (11.3 ± 3.3 vs. 10.7 ± 3.2) and NE peak (0.62 ± 0.3 vs. 1.8 ± 4.59). ICU, 28-d mortality and adrenaline use were significantly higher on ARAS-1 protocol (72.7 vs. 51.5%, id., 87.9 vs. 18.2% $p < 0.005$). Conversely, low-dose steroids use (35.9 vs. 72.7% $p < 0.001$, rhAPC (0 vs. 5%), HVHF (3.3 vs. 39.4% $p < 0.001$) and intra-abdominal pressure (IAP) monitoring (27.3 vs. 66.7% $p < 0.001$) were statistically higher on ARAS-2.

CONCLUSION. In patients with severe SS, the protocolized management according to an established hemodynamic algorithm did demonstrate to improve survival. This may be explained by the use of new therapies, the rationalization on the use of vasoactive drugs, the better monitoring and the intervention of a multidisciplinary group for individual evaluation of every patient.

REFERENCE(S). 1. Hernandez G. Resuscitation 2005, 66:63-69. 2. Cornejo R. Int Care Med 2006 (Mar 21): [Online First].

0067

RAPID IMPLEMENTATION OF SEPSIS BUNDLES CAN IMPROVE OUTCOME

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INTRODUCTION. Sepsis bundles of interventions have been developed [1] for the implementation of the Surviving Sepsis Campaign guidelines for the management of patients with severe sepsis or septic shock. The resuscitation bundle indicates all the interventions that should be obtained in the first 6 hours, while the management bundle those that should be obtained in the first 24 hours. We conducted a prospective, observational study to evaluate the feasibility of the application of the bundles and to study the effect of the time delay of the various interventions on the outcome and the length of stay in the ICU.

METHODS. Consecutive patients admitted in a 31 bed intensive care department of a university hospital with a diagnosis of severe sepsis or septic shock were enrolled. Considering as time 0 the time of admission of the patients in the ICU, the time delay of the various interventions were measured. Patients with persisting severe sepsis after the resuscitation period (first 6 hours), were considered as "candidates" to the management bundle.

RESULTS. 61 patients were enrolled from May to November 2005. Compliance with 6-hour bundle was obtained in 72% (44/61) of patients. As compared to the other patients, the 6-hour compliant group had a lower mortality rate (16% vs 41%, p=0.04) and a shorter length of ICU stay (median: 5 [3-10] days, vs 9 [6-19], p=0.01). Compliance with 24-hour bundle was obtained in 67% (30 /44) of the candidates. The mortality of the compliant group versus the non-compliant was not significantly different (23% versus 33%, p=0.5). Likewise, the length of stay was 6 [4-11] days in the compliant group versus 9 [6-25] (p=0.18). In a post-hoc analysis, patients in which the compliance with the 24 hours management bundle was already obtained after 12 hours had a lower mortality compared with the others (10% versus 39%, p=0.036), and a shorter length of stay (6 [4-10] days versus 9 [6-25], p=0.055).

CONCLUSION. We found both the resuscitation and the management bundle feasible and easy to apply. The compliance with the 6-hours bundle was associated with a reduced ICU mortality and length of stay. The application of the 24-hours bundle in only 12 hours can result in a better outcome.

REFERENCE(S). 1. http://www.ihi.org/IHI/topics/criticalcare/sepsis

0068

DOES ADHERENCE TO THE SURVIVING SEPSIS CAMPAIGN "BUNDLES" IMPACT OUTCOME? AN INDIAN EXPERIENCE

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INTRODUCTION. The Surviving Sepsis Campaign "bundles" contains key strategies towards improving outcome in sepsis [1]. We analysed our adherence to the Surviving Sepsis Campaign "bundles" and its impact on hospital mortality.

METHODS. This was a prospective observational study on 151 consecutive patients admitted with features of sepsis, to a multidisciplinary ICU of a tertiary Indian teaching hospital between September 2005 and February 2006. Diagnosis of sepsis was based on ACCP /SCCM definitions. Data was collected on the parameters that make up EGDT and on the four components of the "management bundle", viz 1) steroid use in septic shock, 2) tight glycemic control, 3) use of activated protein C and 4) lung protective ventilatory strategy. Adherence levels to these goals were evaluated. The admitting APACHE II and SOFA scores were calculated. The primary outcome analysed was hospital mortality. Statistical analysis was with Chi square, student "T" test and logistic regression using SPSS 11.5V.

RESULTS. The mean APACHE II in survivors and non survivors were 15.7 ± 5.29 and 20.6 ± 5.42($p < 0.05$). The mean SOFA score in survivors and non survivors were 3.56 ± 1.42 and 6.2 ± 3.77($p<0.05$). EGDT, early appropriate antibiotic use, steroid use in refractory septic shock, tight glycemic control and lung protective ventilation was achieved in 83.76%, 38.17%, 91.5%, 73.32% and 97.32% of patients respectively. Logistic regression analysis showed that implementation of EGDT, early appropriate antibiotics, and lung protective ventilatory strategy resulted in lower hospital mortality.

TABLE 1.
Mortalty rate (%) in achievers and non achievers of sepsis bundles

	Appropriate antibiotic use	EGDT	Steroids in septic shock	Tight glycemic control	Lung protective ventilation
Achievers	33.65*	36.4*	22*	33.33	38.44*
Non achievers	62.35*	52.13*	36*	38	100*

** indicates p < 0.05.*

CONCLUSION. Failure to adhere to the"sepsis bundles" was associated with an increase in mortality.

REFERENCE(S). 1. Mitchell M Levy et al. Crit Care Med 2004 vol 32; no 11 (Suppl).

0069

SURVIVING SEPSIS CAMPAIGN IN SPAIN: DIFFERENCE BETWEEN PERCEPTION AND OBJECTIVE IMPLEMENTATION

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INTRODUCTION. The implementation of the Surviving Sepsis Campaign (SSC) in Spain started in September 2005 as part of a multicentric, prospective study "Edusepsis", with the support of the Spanish Intensive Care Society (SEMICYUC).

METHODS. Seventy seven ICUs, representing 1251 critical care beds, with an homogeneous distribution around the country were included. During the preliminary phase of the study, we collected data from the subjective perception (SP) of ICU directors on the level of implementation of the guidelines and the general characteristics of the ICUs. During a two month period we collected prospectively data about the implementation of the SSC guidelines, before any specific educational intervention, using the "sepsis bundles" in 731 episodes of severe sepsis or septic shock. We have compared the difference between the SP of ICU directors on the current level of implementation of the guidelines and objective data.

RESULTS. Serum lactate was measured in 37% of episodes (SP 64%), blood cultures were collected before antibiotic administration in 54% of episodes (SP 85%), broad-spectrum antibiotic were administered within 3 hours in 66% of episodes (SP 80%), 20 ml/kg of crystalloid fluid bolus was delivered followed by vasopressors if needed to maintain MAP > 65 mmHg in 40% of episodes (SP 84%), central venous pressure > 8 mmHg was achieved in 23% of cases within 6 hours of presentation (SP 70%), central venous saturation > 70% was achieved in 6% of cases within 6 hours of presentation (SP 54%), low dose steroids was administered in accordance with standardized ICU policy within 24 hours of presentation in 43% of cases (SP 52%), Drotrecogin alfa was administered in accordance with standardized ICU policy within 24 hours of presentation in 46% of cases (SP 51%), glucose control was maintained > lower normal limit with median < 150 mg/dL 6 to 24 hours after presentation in 44% of cases (SP 63%) and median inspiratory plateau pressure was maintained < 30 cmH2O over first 24 hours after presentation in 85% of cases (77%).

CONCLUSION. The current level of implementation of the sepsis guidelines is Spain is low and worse than expected by ICU directors. Great effort should be made in order to improve the implementation of the guidelines in patients with severe sepsis and improve outcome.

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0070

IMPACT OF SEPSIS CARE BUNDLES ON MORTALITY IN SPAIN

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INTRODUCTION. The implementation of the Surviving Sepsis Campaign (SSC) in Spain started in September 2005 as part of a multicentric, prospective study "Edusepsis", with the support of the Spanish Intensive Care Society (SEMICYUC).

METHODS. Seventy seven ICUs, representing 1251 critical care beds, with an homogeneous distribution around the country were included. During a two month period we collected data about the implementation of the SSC guidelines, before any specific educational intervention, using the "sepsis care bundles". The main outcome measures were: the rate of compliance with 6-hour and 24-hour sepsis care bundles and the difference in hospital mortality between the compliant and the non-compliant groups.

RESULTS. We analyzed 731 consecutive episodes of severe sepsis (15.4%) or septic shock (84.6%). The median age of patients was 64 years (male 60%) and APACHE-II at ICU admission was 19. The main sources of infection were: lung 38.5%, abdomen 30.2% and UTI 9.2%. Global hospital mortality was 45%. The rate of compliance with the complete 6-hour sepsis bundle was only 5%. There was not difference in mortality between compliant and non-compliant group (39.4% vs 45.6%; p=0.174). Compliance with the complete 24-hour sepsis bundle was achieved in 11%, without difference in mortality between compliant and non-compliant group (37.8% vs 46.2%; p=0.487). Glucose control was maintained > lower normal limit with median < 150 mg/dL 6 to 24 hours after presentation in 44% of cases, with a significative difference in mortality between compliant and non-compliant group (37.6% vs 51.3%; p=0.001). Median inspiratory plateau pressure was maintained < 30 cmH2O over first 24 hours after presentation in 85% of cases, with also a significative difference in mortality between compliant and non-compliant group (37.8% vs 46.2%; p=0.001). When serum lactate was determined within 6 hours of sepsis presentation (37% of patients), serum lactate was a good predictor of mortality (31.6 mg/dL in survivors vs 43.3 mg/dL in non-survivors; p=0.007).

CONCLUSION. Mortality of severe sepsis and septic shock remains extremely high. Better control of serum glucose and inspiratory plateau pressure during the first hours of sepsis presentation seems to reduce mortality. There is a tendency to have lower mortality in patients treated according the sepsis bundles proposed by the SSC.

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0071

THE PORTUGUESE NETWORK DATA: COMPLIANCE WITH THE SURVIVING SEPSIS CAMPAIGN BUNDLES

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INTRODUCTION. Few studies have been published on the compliance with Surviving Sepsis Campaign (SSC) bundles and how it might influence outcome. The main objective was to show our compliance with the SSC bundles and its influence on outcome.

METHODS. Prospective, cohort, multi-centred study, on community-acquired sepsis (CAS) admitted in Portuguese ICUs, from 01/12/2004 until 30/11/2005 with a follow-up until discharge.

RESULTS. Seventeen units entered the study from north to south of Portugal corresponding to 41% of all ICU beds. Over this period 4142 patients were admitted in the study – 897 (22%) had CAS, 814 (91%) had severe sepsis (362 patients, 40%)/septic shock (452 patients, 51%). Regarding compliance of the 6-hour bundles we accomplished: 1- serum lactate measurement in 60%, 2 - fluids administered to get a MAP of 65 mmHg in 65%, 3-products collected for microbiology before antibiotherapy in 69%, 4-blood cultures done in 55%, 5-antibiotics given within 3 hours of hospital admission in 30%, 6-vasopressores given after adequate fluid challenge in 80%, 7-CVP measurement in 53%, 8-SvcO2 measurement in 15% and 9-dobutamine administered in 50%; at 24-hours: 10-60% had measures implemented to achieve glucose control (<150mg/dl) in 69%, 11- corticoids administered for refractory septic shock in 51%, 12 – programmed plateau pressure < 30 cmH2O in 83%, 13 – Drotrecoginn administered in 4%. A model for logistic regression, related to the 28 day outcome, was built in order to adjust the variables showed in the table to sex, age and SAPS II. The only one significant was administration of vasopressors with a protective effect. But when it was considered a group of actions like: 1+2+3+4+5+6, 6+7+8+9+11 and adjusted for sex, age and SAPS II they diminished 28-day mortality significantly.

CONCLUSION. Taken individually interventions mentioned from 1 to 6 have no influence on mortality. When analysed the group of interventions (1-6) a reduction on mortality was observed in this group of patients. These are easily feasibly interventions that can be done by any doctor at any place, and should probably be done earlier than the six hours.

0072

SEPSIS BUNDLES IN NON INTENSIVE CARE PATIENTS

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INTRODUCTION. On the basis of the Surviving Sepsis Campaign (SSC) guidelines, the Institute of Healthcare Improvement (IHI) has proposed a group of interventions ("sepsis bundles") expected to improve the outcome of patients with severe sepsis (1). The aim of this study was to investigate the compliance with 6-hour severe sepsis resuscitation bundles in non-intensive wards before an institutional program for implementing the SCC guidelines in the hospital (www.policlinico.mo.it).

METHODS. From 1st to 30th April 2005 we studied 807 consecutive patients admitted to 5 surgical and 4 medical wards, accounting for 25% of total hospital beds. Data were collected from the medical records after patient hospital discharge. In patients with severe sepsis, the following 6-hours interventions were analysed: i) diagnosis of severe sepsis within 2 hours from the onset, ii) blood culture before antibiotic treatment, iii) empiric antibiotic therapy started within 2 hours, iv) fluid administration (500ml infused in 30 min), v) measurement of serum lactate and vi) hematocrit maintained >30%.

RESULTS. 17 patients (2% of the admission) met inclusion criteria for severe sepsis. The main sources of infection were respiratory and urinary tract. Within 6 hours from severe sepsis onset, only 6 patients (36%) had a promptly correct sepsis diagnosis; blood culture and empiric antibiotic therapy were carried out in 9 (50%) and 12 (68%) patients, respectively. Serum lactate assessment, adequate fluid administration and haematocrit > 30%. were obtained in 41%, 9% and 77% of the patients, respectively. At 6 hours, the 6 sepsis bundles were satisfied only in 1 patient (5%), while 9 patients (50%) met at least 4 interventions. The 30-day hospital mortality was 29.4% and did not vary with the number of bundles satisfied.

CONCLUSION. Before an educational program aimed to improve management of patient with severe sepsis in the Hospital, we observed that i) the 6-hour resuscitation sepsis bundles are poorly applied in non intensive wards and ii) the number of interventions satisfied does not seem to influence the patient mortality.

REFERENCE(S). 1) Dellinger R P: SSC guidelines for management of severe sepsis and septic shock. ICM2004;30:536-55.

0073

IS THE SURVIVING SEPSIS CAMPAIGN GUIDELINE FOR STRESS ULCER PROPHYLAXIS JUSTIFIED?

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INTRODUCTION. According to the Surviving Sepsis Campaign guidelines, stress ulcer prophylaxis with H_2 receptor inhibitors is recommended (1). A grade A recommendation is stated, but this can be debated. We previously reported a very low incidence of stress-ulcer related bleeding (SURB) in a prospective study of general ICU patients including 48% of patients with sepsis, severe sepsis, or septic shock (2). The aim of this study was to investigate the incidence of SURB in septic patients on prolonged mechanical ventilation (>72 hours).

METHODS. We performed an explorative database study of prospectively collected data in our teaching hospital with 18 ICU beds (medical/surgical). No stress ulcer prophylaxis is routinely used. SURB was defined as 1) a bleeding from the upper gastrointestinal tract that needed the transfusion of packed cells, or 2) the confirmation of bleeding mucosal lesions on endoscopy.

RESULTS. Between January 1, 2000 and December 31, 2005, 11066 adult patients were admitted to the ICU, of which 301 patients with severe sepsis or septic shock. All patients were treated according to a clinical regimen described earlier, focusing on infection prevention by selective decontamination of the digestive tract and maintenance of adequate (micro) circulation without using stress-ulcer prophylaxis (2). Of these patients, 196 were on the ventilator for more than 72 hours. Only one patient (0.5%) had a bleeding due to a stress ulcer on the transition of corpus to antrum on day 16.

CONCLUSION. Because stress ulcers are a consequence of gastric hypoperfusion (3), prevention should be performed by optimizing the microcirculation; use of H_2 receptor antagonists should be omitted from the guidelines.

REFERENCE(S). (1) Dellinger R P, Carlet J M, Masur H et al (2004) Surviving sepsis campaign guidelines for management of severe sepsis and septic shock. Crit Care Med 32:858-873.
(2) Zandstra D F, Stoutenbeek Ch P (1994) The virtual absence of stress-ulceration related bleeding in ICU patients receiving prolonged mechanical ventilation without any prophylaxis. Intensive Care Med 20:335-340.
(3) Mutlu G M, Mutlu E A, Factor P (2001) GI complications in patients receiving mechanical ventilation. Chest 119:1222-1241.

Poster Sessions
Non bacterial infections 0074-0087

0074

CASE SERIES OF ACTIVE PULMONARY TUBERCULOSIS REQUIRING MECHANICAL VENTILATION

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INTRODUCTION. There is a high mortality rate in patients with active pulmonary tuberculosis (APTB) who require mechanical ventilation (MV). This paper examines the characteristics of such patients treated in our medical intensive care unit (MICU).

METHODS. From March 2004 to March 2006, 9 patients with APTB were admitted to MICU of a university-affiliated general hospital for MV. Clinical, radiological and bacteriological data were recorded.

RESULTS. There were 8 males and 1 female. The mean age was 67.4 ± 12.0 year old. 7 patients were intubated for acute respiratory failure (ARF), 1 patient for massive hemoptysis and another for antituberculous drug induced toxic epidermolysis necrosis. Except the patient with miliary TB, all patients have positive acid fast bacilli in their sputum samples which cultured Mycobaterium tuberculosis complex. 5 patients had APTB diagnosed and their antituberculous treatment started 2 to 16 weeks before MICU admissions. The other 4 were diagnosed APTB upon hospital admission. The mean albumin and haemoglobin levels were 23.4 ± 6.5 g/L and 10.1 ± 1.2 g/dL respectively. Most had underlying co-morbid conditions, including advanced malignancies (2), acquired red cell aplasia on immunosuppressants (1), chronic hepatitis C (1), chronic drug abuser and alcoholism (1), parkinsonism (1) and chronic schizophrenia (1). Chest radiographs show miliary pattern (1), upper lobe consolidation (2), and multilobar consolidation (6). 8 out of 9 patients died. The mortality rate was 89.9%. The mean APACHE II score was 29.4 ± 4.75. The median PO2/FiO2 of 7 patients with ARF was 146 (63 to 270). The median duration of MV was 3 days (1 to 15). The patient who survived was the one who had massive haemoptysis and underwent a successful bronchial artery embolisation. 5 died of multiple organ failure (MOF) in MICU. 2 had advanced cancers and were extubated and transferred to general ward for terminal care. One patient was extubated successfully but readmitted twice later to MICU for nosocomial pneumonia and acute myocardial infarct, and died subsequently.

CONCLUSION. The characteristics of patients with APTB requiring MV are ARF, high APACHE II score, MOF, advanced age, low albumin and haemoglobin levels, multilobar consolidation on chest radiograph and one or more co-morbid medical conditions.

0075

MARKERS OF CMV ACTIVATION IN GENERAL ICU

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INTRODUCTION. Significance of viral infections in the general ICU population remains unclear. CMV is considered one of potential pathogens (1). Therefore we included monitoring of CMV activity to standard imuno-monitoring protocol in our ICU.

METHODS. Study was approved by local EC and waiver to informed consent was obtained. Patients who at D1 (D0 = admission) were estimated to stay in the ICU > 3 days were eligible. In this abstract we report on development of markers of CMV activation (serology, PCR from blood) during ICU stay and activity of CD8+CD38+ T-cell subset (CD38+) which besides HIV - was also reported useful in monitoring CMV and EBV infections (2).
Data are presented as median (Q25;Q75), Kruskal-Wallis ANOVA and Mann-Whitney U test were used when appropriate, $p < 0.05$ considered significant.

RESULTS. Monitoring was performed in 101 patients from January 2005 to February 2006. In 83 patients IgG to CMV was present at D1 and no seroconversion occurred in remaining 18 patients during ICU stay. In only 7 cases IgM titre was positive at least once during ICU stay and only in 2 of them significant positivity (titre > 1:700) was measured. In both of these patients PCR and CD38+ was also positive (> 20%). Only 1 patient (polytrauma with ICU stay >28 days) was treated with gancyclovir. PCR was positive at least once in 8 patients, in 7 marginally (< 10 copies in 105 leukocytes) and in only one patient clear positivity was detected (23 copies). In this patient PCR was positive on D1 and then remained negative so as IGM, CD38+ became positive from D21.
CD38+ expression significantly increased during ICU stay in patients who stayed in the ICU >15 days (n=35, p<0.0001) and there was no difference in survivors and nonsurvivors. No correlation between CD38+ and CD14+HLADr+ was found.

CONCLUSION. In general ICU CMV reactivation seems to be very rare and cannot explain activation of CD38+ T cells which is frequent in long tern ICU patients.

REFERENCE(S). 1. Marik PE, Weinmann A (2001) Cytomegalovirus in "immunocompetent", critically ill, intensive care patients. Crit Care Med 29(3):681-2.
2. Belles-Isles M, Houde I, Lachance JG, Noel R, Kingma I, Roy R Monitoring of cytomegalovirus infections by the CD8+CD38+ T-cell subset in kidney transplant recipients. Transplantation. 1998 Jan 27;65(2):279-82.

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0076

CASPOFUNGIN FOR THE TREATMENT OF INVASIVE MYCOSES IN CRITICALLY ILL PATIENTS (PROCAS STUDY)

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INTRODUCTION. Caspofungin is an echinocandin with proven efficacy against invasive candidiasis (IC) and aspergillosis (IA). The ProCAS study is an ongoing multicenter, prospective, noncomparative observational study sponsored by GTEI-SEMICYUC and PETHEMA, aimed at estimating the effectiveness and safety of caspofungin in adults with IC or IA under everyday conditons.

METHODS. The interim analysis herein presented focused on the first 45 critically ill patients enrolled. Caspofungin was generally dosed as recommended in the package insert. Favourable outcomes included complete and partial responses on the last day of caspofungin therapy. Safety was assessed up to 14 days post-caspofungin.

RESULTS. Twenty-four [53%] medical, 18 [40%] surgical, and 3 [7%] trauma critically ill patients were analyzed. The median age was 57 years (range, 21-83). Seventeen (38%) patients had candidemia, 12 (27%) other types of IC, 7 (21%) suspected IC (6 had a Seville Score [1] of >7 and a Candida Score [2] of >2.5), and 9 (20%) suspected or proven IA. Non-albicans Candida accounted for 43% of all Candida isolates causing infection. The median duration of caspofungin therapy was 17 days (range, 2-337). Thirty-six (80%) patients received caspofungin alone and 9 (20%) in combination with other antifungals. Caspofungin was given as first line therapy to 29 (64%) patients. The remaining patients were either refractory (15 [33%]) or intolerant (2[4%]) of other drugs. Favourable response rates were 83% (24/29) for proven IC and 60% (3/5) for documented (proven or probable per EORTC criteria) mould infections. Of note, two IA responders were mechanically ventilated and one received caspofungin as first line monotherapy. Overall, 3 (7%) patients had an adverse reaction to caspofungin (two non-serious, one serious). No significant changes in serum liver function tests and creatinine occurred during caspofungin therapy. No relapse was detected among favourable responders (median follow-up, 59 days; range, 1-89). Overall and infection-related mortalities were 38% (17/45) and 29% (13/45).

CONCLUSION. The results of this interim analysis of the ProCAS Study suggest that, under everyday conditions, caspofungin is an effective and safe alternative for the treatment of invasive mycoses in critically ill patients.

REFERENCE(S). 1) Garnacho Montero J et al. Med Intensiva Supl 2005;3:43. 2) Leon C et al. Crit Care Med 2006;34:730.

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0077

RHABDOMYOLYSIS COMPLICATING ADULT INFLUENZA INFECTION

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INTRODUCTION. Influenza A and B are single-stranded RNA viruses of the family of Orthomyxoviridae. Rhabdomyolysis is a recognized but uncommon complication of influenza A and B infection.

METHODS. We conducted a retrospective case study and report four adult cases of influenza infection. Two patients required renal replacement therapy. All survived critical care.

RESULTS. Case 1. A 34-year old male presented with symptoms and signs of sepsis, presumed pulmonary in origin, with altered renal performance. His creatine kinase (CK) was measured at 5560 u/L. He required ventilatory support and renal replacement therapy. His nasopharyngeal aspirate revealed influenza A. Case 2. A 73-year old man, father to Case 1, presented with cough and chest radiograph infiltrates in the left lower lung zones. His CK was measured at 2700 u/L. He was commenced on amantadine therapy and made an uncomplicated recovery. Case 3. A 66-year old woman, mother of Case 1 and wife of Case 2, presented with a short history of a 'flu-like' illness. She was pyrexial, tachypnoeic with bibasal shadowing on her chest radiograph. Her jeopardized renal performance necessitated intravascular fluid administration and subsequent diuretic administration. Her highest measured creatinine concentration was 400 mcmol/l. Amantadine was added to her treatment regimen. She made an uncomplicated recovery and was subsequently discharged home. Case 4. A 47-year old woman presented following a collapse at home and a short history of malaise. She deteriorated in hospital requiring cardiorespiratory support and renal replacement therapy. Her CK was elevated (123,000 u/L). She developed compartment syndromes in her forearms requiring bilateral fasciotomies. Despite surgery her CK levels rose further and peaked at 304,000 u/L. Her nasopharyngeal swab revealed influenza B. She had a prolonged ITU stay requiring tracheostomy to facilitate weaning from ventilatory support. She was discharged to the ward for follow-up with the plastic surgeons and physicians.

CONCLUSION. There should be a low threshold for measurement of CK concentrations and urinalysis for myoglobin in adult patients with flu-like illness and altered renal function.

0078

PANDEMIC FLU: A SYSTEM OF TRIAGE TO HIGHER LEVELS OF CARE (PMEWS)

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INTRODUCTION. In event of pandemic flu outbreak there is an expected dramatic upsurge in hospital attendance. Projected figures show a 700% increase (1). The problem that we face is how to rapidly triage these patients efficiently to appropriate areas. We suggest the use of a non-organ specific, purely clinical screening tool for: Symptoms of Pandemic flu; Organ dysfunction (modified early warning score (2) including transcutaneous sats); Chronic disease / Performance Level / Age and Adverse social factors (This factor dictates hospital admission not level of care). As respiratory dysfunction is likely to be the major complication of pandemic flu we based initial validation on community acquired pneumonia. PMEWS triage was compared with the current UK standard CURB-65.(4)

METHODS. Retrospective analysis of all adult patients, self presenting to SMUHT with a diagnosis of Pneumonia Feb-Dec 2005. Data was extracted from admission documentation, from this the PMeWS, and CURB 65 scores were calculated. Higher Level of care was defined as those requiring Level 2 or 3 (3). Data was analysed using SPSS 11.5.

RESULTS. Total attendances 242. Admissions 187. Level (2-3) 84 (42excluded).

TABLE 1.

OUTCOME:Level 2/3 Care

	Sensitivity	Specificity	PPV	NPV
CURB65>/=3	50	70	34	81
PMEWS>3	97	32	30	97
PMEWS>5	88	64	43	95
PMEWS>7	64	86	59	89
PMEWS>11	8	98	60	78

CONCLUSION. The PMEWS score as compared to CURB-65 effectively triages those in need of higher levels of care, area under ROC curve 0.83.

REFERENCE(S). 1) UK Health Departments. UK Influenza Pandemic Contingency Plan: DOH; 2005. 2) Subbe C, Kruger M, et al. Validation of a modified early warning score in medical admissions. Quarterly Journal of Medicine 2001; 94:521-6. 3) Comprehensive Critical Care:UK DOH; 2000 4) Lim W S, van der Eerden M M, et al. Defining community acquired pneumonia severity on presentation to hospital. Thorax 2003; 58:377–82.

0079

UPPER DIGESTIVE TRACT CANDIDA COLONIZATION IN NON-NEUTROPENIC PATIENTS VENTILATED

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INTRODUCTION. To evaluate Candida spp isolates in the upper digestive and respiratory tracts in non-neutropenic patients ventilated for more than forty-eight hours.

METHODS. An observational, analytic study was conducted prospectively (January 2000 to June 2002) in a 16-bed medical-surgical ICU of a tertiary care hospital. Inclusion criteria: Detection of Candida spp in some sample during ICU stay in ventilated patients with Systemic Inflammatory Response Syndrome (SIRS) criteria. Statistical methods: Categorical variables were compared among groups with the Chi-square or Fisher's exact test as appropriate. Continuous variables were analyzed with the Student's t-test (mean ± standard deviation). Statistical significance was established at $p < 0.05$.

RESULTS. A total of 73/2265 cases (3.22%) were included. APACHE III was 80.01 ± 24.88, 37% were surgical patients, ICU stay until the first positive culture was 9.37 ± 8.55 days, ICU stay was 29.49 ± 21.46, ICU mortality was 30.1% and hospital mortality 38.4%. Respiratory foci were detected in 76.7% of patients, digestive foci in 65.8% and multifocality in 64.4%. Three cases of candidemia and none of endophthalmitis were detected. There were no significant differences in the APACHE III score and mortality according to whether patients were positive for respiratory or digestive foci or not. Patients with digestive foci showed greater severity on the SOFA score, both at the first positive Candida spp culture ($p=0.018$) and at the screening ($p=0.011$), but patients with respiratory foci did not. Antifungal treatment was used in cases of multifocality colonization.

CONCLUSION. In non-neutropenic patients with more than forty-eight hours of mechanical ventilation and with less severe multiple organ dysfunction, the upper digestive tract is less colonized by Candida spp than the respiratory tract.

REFERENCE(S). 1. Ibañez-Nolla J, Nolla-Salas M, Leon M A, et al., Early diagnosis of candidiasis in non-neutropenic critically ill patients. J. Infect. 2004; 48: 181-92
2. Leon C, Ruiz-Santana S, Saavedra P, et al., A bedside scoring system ("Candida score") for early antifungal treatment in nonneutropenic critically ill patients with Candida colonization. Crit. Care Med. 2006; 34: 730-7

0080

SENSITIVITY AND SPECIFICITY OF CANDIDA COLONIZATION IN THE UPPER DIGESTIVE AND RESPIRATORY TRACTS

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INTRODUCTION. To evaluate Candida spp colonization in the upper digestive and respiratory tracts in non-neutropenic patients ventilated for more than 48 h.

METHODS. An observational, analytic study was conducted prospectively (1988-2002) in a medical-surgical ICU of a tertiary care hospital. Inclusion criteria: Detection of Candida spp in some sample during ICU stay in ventilated patients with criteria of severe sepsis. Statistical methods: Categorical variables were compared among groups with the Chi-square or Fisher's exact test. Continuous variables were analyzed with the Student's t-test (mean ± standard deviation). Statistical significance was established at $p < 0.05$. Sensitivity and specificity were also measured.

RESULTS. A total of 207/5293 cases (3.91%) were included. APACHE III was 78.27 ± 26, 37.7% were surgical patients and days of ICI stay until first positive culture were 10.73 ± 9.08. The first positive culture was obtained from the respiratory tract in 67.6% of patients. Days of ICU stay were 31.27 ± 19.37, ICU mortality was 33.3%. Respiratory foci were detected in 83% of patients and digestive foci in 73%, Multifocality was determined in 74.4% of patients.

TABLE 1.

Multifocality: Sensitivity and Specificity of different foci

	Sensitivity	Specificity
1st + culture respiratory tract	74%	24%
Respiratory foci	82%	53%
Digestive foci	93%	70%

CONCLUSION. In non-neutropenic patients with more than 48 h. of mechanical ventilation and severe sepsis, colonization of the upper digestive tract shows greater sensitivity and specificity in predicting multifocal colonization by Candida spp than colonization of the respiratory tract.

REFERENCE(S). 1. Ibañez-Nolla J, Nolla-Salas M, Leon M A, et al., Early diagnosis of candidiasis in non-neutropenic critically ill patients. J. Infect. 2004; 48: 181-92. 2. Azoulay E, Timsit J F, Tafflet M, et al., Candida colonization of the respiratory tract and subsequent pseudomonas ventilator-associated pneumonia. Chest 2006; 129:110-7.

0081

INCIDENCE AND MORTALITY DUE TO INTRAVASCULAR CANDIDIASIS IN CRITICALLY ILL PATIENTS. A COHORT STUDY

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INTRODUCTION. It is known that Candida spp infection is an increasing and worrying disease in critically ill patients. It has been advocated that treatment should start as soon as possible under evidence or suspicion of Candida spp infection. The aim of this study is to present the incidence and mortality of Intravascular Candidiasis (IVC) from a general Intensive Care Unit (ICU).

METHODS. From April 2004 to December 2005 all patients admitted in the ICU were prospectively enroll in a Cohort study. Every day a check list was performed to determine de presence of Systemic Inflammatory Response (SIRS), documented or highly suspected infection, antibiotics and antifungical drugs prescribed. During admission and or at any time during the length of stay in the ICU cultures from Blood Stream (BS), tip of Central Venous Catheter (TCVC), and any other place potentially infected or colonized with Candida spp was indicated. A case of Candidiasis was defined when a culture for Candida spp was reported. A positive case for IVC was defined when a Candida ssp was isolated from BS and or a TCVC. Control was defined as a patient in whom Candida spp. was not isolated. Tables of 2X2 and Chi square or Fisher's test were performed to determine association between mortality and the presence or absence of IVC and antifungical treatment.

RESULTS. 909 critically ill patients were included; Candida spp was isolated in from 59 patients (incidence of 6.4%). Intravascular Candidiasis was identified In 14 patients (incidence of 1.5%). Candida spp was isolated from BS in 7 patients (0.77%); from TCVC of 4 patients (0.44%); finally, from BS and TCVC of 3 patients (0.33%). Candida Albicans was the most common type of Candida specie isolated. The total mortality observed in the ICU during the study period was 30.3%. Associated mortality due to Candida spp was 55.9% in contrast with 25% of mortality from patients without Candida spp. The mortality rate of patients with IVC was 85.7% versus 46.66% from patients with non IVC, a relative risk for mortality of 2 (0.14-0.40). All patients with IVC, except two, received antifungical treatment. Two patients survive to the ICU. Mortality directly attributable to candidemia was observed in one patient.

CONCLUSION. In our ICU, IVC has a low incidence and lower mortality attributable to Candida spp. However, high associated mortality is observed despite of treatment.

0082

ANTI HSP-90 (MYCOGRAB®), FIRST EXPERIENCE WITH NEW COMBINATION THERAPY IN SEVERE FUNGAL INFECTIONS

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INTRODUCTION. Fungal infections are amongst the most challenging complications in the critically ill. Recently, a large multicenter study (1) was performed to investigate the additive role to amphotericin B in severe Candida infections of a recombinant antibody against hsp-90, involved in the development of drug resistance to i.e. imidazoles (2). It also has a role in the induction of NO-synthase. In sepsis blocking of excess NO production might be a positive side-effect of Mycograb®.

METHODS. All case records were extracted from our patient data management system and combined with laboratory results. APACHE and SOFA scores were calculated from these data.

RESULTS. In total 5 patients received treatment, 4 during the study and one off-study. Average age was 62 ± 6 yrs., one female and four male. Four patients had a positive culture of C. albicans, one patient had C. glabrata, one patient C. krusei and C. glabrata, and one patient C. albicans and C. species. Four patients had an intra-abdominal source with peritonitis, one pulmonary empyema after esophagectomy, one infected retroperitoneal haematoma. Resolvement of a positive culture was seen after 24 hours in two patients, 48 hrs. in one patient, 6 days in one patient and one patient died on day 6 of refractory multiple organ failure and still had a positive culture. Average APACHE-II score was 25.4 ± 9.8. The SOFA score on day 1 was 6.8 ± 2.7. On day 6 (after treatment with Mycograb® was concluded) 5.6 ± 1.5 and at conclusion of the study period at day 10 6 ± 2.2. Average ICU stay was 36 days in this group. In the treated group 4 patients survived and one died. There were no adverse events attributable to the study drug.

CONCLUSION. Our impressions comprise a favourable resolving of positive Candida cultures in most patients, even with complex surgically treated sources. No adverse events were seen. Clinical recovery as measured with the SOFA score shows a tendency to reduction by day 5 and day 10.

REFERENCE(S). 1. Pachl J, Svoboda P, Jacobs F, et al. A randomized, blinded, multicenter trial of lipid-associated amphotericin B plus Mycograb versus lipid-associated amphotericin B plus placebo in the treatment of invasive Candidiasis. CID 2006, in press.
2. Cowen L E, Lindquist S. Hsp 90 potentiates the rapid evolution of new traits: drug resistance in diverse fungi. Science 2005;309:2185-89.

0083

CANDIDA COLONIZATION AND INFECTION IN A MIXED MEDICAL AND SURGICAL ICU: AN EPIDEMIOLOGY STUDY

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INTRODUCTION. The aim of this study was to analyze the incidence of Candida colonization and infection in an ICU, the predisposing risk factors and the impact of candidemia on outcome.

METHODS. Prospective, observational, epidemiological study. The demographic characteristics of all patients admitted were recorded, as well as the underlying diseases, disease severity as estimated by the APACHE II score and possible predisposing factors, such as presence of central venous catheters, diabetes mellitus, renal failure, etc. Bronchial secretions were cultured every week. Statistical analysis was performed using SPSS version 12.0.

RESULTS. Over a period of twenty months 190 patients were admitted, of whom 34% were medical and 66% were surgical. Their mean age was 68 years and 125 were male. Their mean APACHE II score on admission was 17.3. Fifteen episodes of candidemia were recorded in 13 patients (6%). Seven isolates were C.albicans, while 8 (53%) were non-albicans (3 C.parapsilosis, 1 C.tropicalis, 1 C.glabrata, 1 C.lusitaniae, 1 C.krusei and 1 C.famata). Eighty-three patients (44%) had bronchial colonization. Of these 12 developed candidemia, while only one of the non-colonized patients did ($p<0.001$). Statistical analysis identified risk factors predisposing to bronchial colonization: Apache II score ($p=0.003$), duration of intubation >7 days ($p<0.001$), duration of stay in ICU ($p<0.001$), total parenteral nutrition ($p=0.002$), steroids ($p=0.03$) and previous administration of quinolones ($p=0.012$). On multivariate analysis, duration of intubation, length of stay in ICU and total parenteral nutrition emerged as independent risk factors. Regarding candidemia bronchial colonization was shown to be an independent risk factor ($p=0.02$) on multivariate analysis, while the duration of stay in the ICU and the duration of intubation were identified as risk factors in univariate analysis. Candidemia had a significant impact on the final outcome of patients ($p=0.006$).

CONCLUSION. 1) Patients who stay in the ICU for longer periods of time, as well as those receiving total parenteral nutrition and broad spectrum antibiotics, are at a higher risk for bronchial colonization by Candida sp. 2) Colonization seems to predispose to candidemia, which in its turn increases the mortality of ICU patients.

0084

ZYGOMYCOSIS BY RHIZOPUS SPECIES – A VERY RARE ANGIOINVASIVE MYCOSIS. CASE SERIES OF FIVE PATIENTS

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INTRODUCTION. Zygomycosis caused by Rhizopus species (Rhsp) is an aggressive, rapidly progressive opportunistic fungal infection. Predisposing factors are immunosuppression owing to severe diseases or metabolic disturbances. The special features of Rhsp infections are angioinvasive growth, necroses of infected tissue and perineural invasion. The invasion of blood vessels is remarkable for a fungal infection.

METHODS. We report about a case series of five patients with a rhizopus infection.

RESULTS. Pat 1 (m 72y): Insignificant past medical history, except appendectomy with secondary wound-healing. No immune defect before. Operation because of adhesion ileus, postop. septic shock owing to peritonitis. Pat. 2 (m 53y): Dialysis for chronic renal failure. Septic shock due to ischemic colonic necrosis, protracted peritonitis because of recurrent bowel fistula. Pat 3 (m 42 y): Insignificant past medical history. Gastrectomy because of carcinoma, postoperative pleural empyema and severe pneumonia, recurrent subphrenic abscesses, pancreatic fistula and peritonitis owing to fistula of flexura coli sinistra. In all three patients microbiologically proven abdominal infection with Rhsp. after 1/2/2.5 (Pat. 1/2/3) month therapy with multiple lavages and antibiotics. Antifungal therapy with Amphotericin B (Pat. 1,2) and liposomal preparation (Pat 3). Pat 4 (f 73y): Delayed clinical course according to infection of hip-TEP- and femoropopliteal bypass, eventually exarticulation of hip joint, pneumonia, severe sepsis, ARDS, acute renal failure. Subsequently detection of Rhsp in bronchoalveolar lavage. Therapy with Amphotericin B. Pat 5 (m 68 y): Kidney transplantation of in past medical history, presenting with acute renal failure. Quite a few infections before. Abscessing right side pneumonia, pleural empyema. Rhsp in the empyema fluid. Resection of lower right lung, resection of renal graft because of rejection. Treatment with Caspofungin because of additional Candidemia, several septic phases. All but one patient (Pat 3) died later on despite of all efforts. No clue for soiling in environmental microbiological examinations.

CONCLUSION. Literature reveals not many cases of zygomycoses caused by Rhsp., mostly observations of small subgroups. Different therapeutic regimens are difficult to assess with evidence based methods. The affinity to blood vessels, where Rhsp. multiply and the vascular invasion with thrombosis and infarction are complicating all therapeutic efforts, which should include aggressive surgical resection whenever possible and Amphotericin B.

0085

SYSTEMIC FUNGAL INFECTIONS IN THE ICU: CLINICAL CHARACTERISTICS, TREATMENT AND OUTCOME

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INTRODUCTION. Fungal infections have been increasing and represent an important cause of nosocomial infection in the ICU. The aim of this study was to analyze the clinical characteristics of the patients in the ICU who developed a systemic fungal infection during a period of 20 months, as well as the treatment they received, either as prophylaxis or as therapy.

METHODS. The demographic and clinical characteristics of all patients admitted to the ICU were prospectively recorded. A patient was considered to have a systemic fungal infection when he had either candidemia or a positive culture for fungi from a site that is normally sterile. The antifungal agents used were also recorded.

RESULTS. During the study period 190 patients were admitted to the ICU. Of these, 65 were medical and 125 were surgical. Of the medical patients 3 (5%) developed a fungal infection, while of the surgical 17 (14%). Fifteen episodes of candidemia were recorded in 13 patients. In another seven patients, which were all surgical, there were positive cultures for Candida spp. from pus taken from the abdominal cavity either intra-operatively or with paracentesis under ultra-sound guidance. The mean age and mean APACHE II score of the group of patients with a fungal infection were 58 years and 20.3 respectively. Fourteen (70%) were male. Thirteen had undergone an abdominal surgery and three major vascular surgery. Twelve (54%) of the isolated species were C.non-albicans (4 C.parapsilosis, 3 C.glabrata, 2 C.tropicalis,1 C.krusei,1 C.lusitaniae and 1 C.famata) while the rest (46%) were C.albicans. Of the patients who developed candidemia none had received antifungal prophylaxis, while of the other seven, four had received fluconazole. All patients, except two, received therapy on time. The agents used were conventional amphotericin-b, liposomal amphotericin-b, caspofungin, fluconazole and voriconazole. The mortality rate of the patients with a Candida infection was 75%, while the cumulative mortality in the ICU was 38%.

CONCLUSION. 1) Systemic fungal infections are more common in surgical than in medical ICU patients. 2) Non-albicans species are prevailing in our ICU. 3) Fungal infections are connected with a high mortality rate, although other factors, such as bacterial infections or underlying diseases, may also contribute.

0086

CANDIDURIA IN THE ICU: DOES IT CORRELATE WITH CANDIDEMIA?

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INTRODUCTION. Candiduria is increasingly observed in ICU patients usually having an indwelling urinary catheter, especially so in those presenting risk factors as diabetes, corticosteroid use and excessive antibiotic exposure. It is debated if it precedes candidemia episodes in colonized patients and if clearance should be sought.

METHODS. In an effort to answer this question a retrospective study was performed evaluating all patients admitted to a new 5-bed general ICU the last 28 months (November 2003-March 2006) for the presence of candiduria and candidemia episodes. Surveillance cultures of bronchial secretions, urine and fecal samples, as part of the ICU antibiotic policy, were performed, initially on a weekly and subsequently on a biweekly basis. Antifungal prophylaxis was not administered in the ICU and parenteral nutrition was not a routine procedure.

RESULTS. During the study period 266 patients were admitted to the ICU and 3395 patient-days were recorded. Candiduria in any count was detected in 53 patients but only in 21 (25%) among those hospitalized for more than 7 days in the ICU (incidence 6.2/1000 catheter-days) representing true ICU acquired candiduria. Patients with ICU-acquired candiduria had a mean age of 69.3 (range 33-89), more than 80% were already hospitalized and all were exposed to antibiotics. Candiduria appeared at a mean of 16 days after admission to the ICU (range 8-67 days). Candida albicans predominated among urine isolates (59%). During the same period 12 episodes of candidemia in 11 patients were recorded (10 ICU-acquired), 66% due to Candida albicans. Using the X2-test candiduria was found to correlate with candidemia in a statistically significant way ($p<0.001$). Colonization index, expressing the ratio of colonized sites per sites tested for colonization (respiratory, urine, fecal), exceeding the value of 0.5 correlated also significantly with candidemia episodes ($p<0.001$), while bronchial colonization only did not show a significant correlation. Patients with candiduria had an in-hospital mortality of 58.5% and those with candidemia of 73%, as a reflection of their severity of illness.

CONCLUSION. Candiduria in an ICU patient, may be an index of the patient's risk for candidemia and along with simultaneous colonization at other sites may be an indication for antifungal treatment in patients presenting with severe sepsis.

0087

ANTIFUNGAL ACTIVITY OF RIFAMPICIN/MYCONAZOL COATED CENTRAL VENOUS CATHETERS AGAINST CANDIDA ALBICANS

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INTRODUCTION. Candida is an increasing cause of bloodstream infection, including catheter related infections, in critically ill surgical and medical patients. In our previous studies, we have shown that antibacterial/antiseptic coated central venous catheters are not very effective against Candida adherence and further colonization. The aim of the present study was to evaluate the activity of a novel central venous catheter coated with rifampicin and mycanazol against Candida albicans.

METHODS. Non-antiseptic Hickman catheter used as a control group. All catheter segments were trisected in one-centimeter pieces and were immersed in phosphate-buffered saline (0.01 mol/l) with 0.25% dextrose and incubated at 37 degrees C. This solution was replaced daily. On days 1, 3, 7, 14 and 21, a 1 ml standardized inoculum Candida albicans was added for 30 min and then replaced with phosphate-buffered saline with 0.25% dextrose. One-third of the samples were sonicated and plated to determine fungal adherence immediately at 30 min. The remaining segments were plated in sabora-dextrose agar after 4 and 24 h incubation time to determine the further formation of fungal colonies.

RESULTS. At 30 minutes, fungal adherence to the rifampicin/mycanazol coated catheters was found to be significantly lower then the control group in all days ($p<0.05$). Candida albicans colonization at 4 hours was also significantly lower than the control group catheters in all days. At 24 hours, although the treated catheter colonization was lower than the control group catheters, this did not reach statistical significance.

CONCLUSION. Central venous catheters coated with rifampicin/mycanazol were found to be effective against initial Candidial adherence. These catheters are also effective against Candida albicans colonization for a limited time period.

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0089

S100B PROTEIN - A POSSIBLE PROGNOSTIC FACTOR IN PATIENTS WITH A HEAD TRAUMA INJURY

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INTRODUCTION. S100B protein is a small dimeric protein which belongs to the group of calcium binding proteins. It is present in high concentrations in glial cells and Schwann cells. The level of this marker is highly specific for lessions of the central nervous system. The aim of our research was to evaluate a consequence of a dynamic monitoring of the S100B protein levels for a prognosis of pateints with a head trauma injury.

METHODS. 120 patients with a head trauma injury were prospectively monitored. All patients were admited to the Emergency Department of the University Hospital in Pilsen. The time period from injury to admission was shorter than 6 hours. All patients had a positive finding at the initial CT scan of the brain. We used scoring protocols ad admission GCS, APACHE II, ISS, TRISS, at dismissal GOS, KPS. The S100B protein level was done by LIA Essay on fully automated immunoanalyser Liaison, DiaSorin, Sweden. The S100B protein level measurement was done at admission, after 6, 12, 24 and 72 hours.

RESULTS. We found no correlation among S100B protein levels, gender and age. The initial S100B protein level corresponded to GCS, APACHE II and TRISS, but only partly to CT scan[finding at admission. We found following correlations: The initial S100B protein level is very important for the prognosis especially the initial level above 1 microg/L, but it is necessary to evaluate the S100B 0h/S100B 72h ratio. Rapid decrease of the levels in the first 72 hours to normal value is associated with a good prognosis. The initial level can be relatively high, but the S100B 0h/S100B 72 h ratio must decreased minimally by 300%. Persistent high levels in the first 24 hours and decrease of the level after this time period is associated with good prognosis too, but the result is depended on the initial level more, because the S100B 0h/S100B 72h ratio is worse.
Repeated increase of the S100B protein levels after previous decrease is associated with poor outcome in GOS and KPS. The high initial level and the low S100B 0h/S100B 72h ratio are typical for this group.

CONCLUSION. The S100B protein is a good prognostic marker in comparison with others scoring systems. The course of the dynamic evaluation is by our opinion useful for more accurate determination of the prognosis.

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Poster Sessions
Emergency medicine 0088-0101

0088

EARLY AND LATE OUTCOME DETERMINANTS IN SEVERE HEAD TRAUMA

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INTRODUCTION. The objective is to determine the incidence, nature, demographics, severity and mortality in patients who suffered severe head trauma. To relate mortality to determinants of primary and secondary brain injury.

METHODS. Patients who arrive the ER of Hospital de Santo António, university tertiary hospital and the trauma centre for a region of the north of Portugal, are enrolled in trauma registry, epidemiological data and severity using TRISS methodology.

RESULTS. 863 patients were admitted from August 2001 to December 2005. 88.3% (n=762) had head trauma. 597 patients were male with a mean age of 44 $\pm$ 22 years. The cause was blunt in 96.1%. Median head AIS, ISS and TRISS was 4.04 $\pm$ 1.06, 21.28 $\pm$ 9.9 and 76.7% $\pm$ 27.6%. Hospital mortality was 32.3%, 57% died in the first 48 hours (early) and 19% died more than a week after admission (late). Multivariate regression (stepwise method, $p<0.05$) shows age, ISS, RTS, AIS, blood pressure and lactate associated to early mortality and only age, RTS and AIS to the late one (table 1,2)

TABLE 1.

	Early Mortality OR	CI95%
Age	1.01	1.0-1.02
ISS	1.03	1.0-1.05
RTS	0.44	0.3-0.5
AIS	1.98	1.4-2.7
Lactate	2.09	1.2-3.5
Hipotension	2.5	1.3-4.8

TABLE 2.

	Late Mortality OR	CI95%
Age	1.02	1.0-1.03
RTS	0.7	0.55-0.86
AIS	1.9	1.3-2.6

CONCLUSION. Shock in head trauma patients is associated with early but not late mortality.

0090

NATIONAL MULTICENTER STUDY OF ADULT RESPIRATORY DISTRESS SYNDROME (ARDS) IN SEVERE TRAUMA

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INTRODUCTION. ARDS is a serious complication of patient with severe trauma and it is linked to severe complications and high mortality. Our purpose was describe epidemiologic characteristics, risk factors, complications and outcomes of severe trauma ards in Spain

METHODS. Multicenter, observational study achieved for 15 months. Variables collected were intra and extra-hospital. We defined severe trauma as that with revised trauma score $\leq$ 11 and/or ISS $\geq$ 16. Variables: demographics, severity scores, diagnosis-related groups in emergency department and according to CIE-9, therapeutics, including surgical therapeutics in the first 24 hours, ards characteristics, duration of mechanical ventilation, length of stay (LOS) in ICU, complications and mortality.

RESULTS. We identified 122 patients with 84.4% of males. They suffered thoracic injury (59%), severe traumatic brain injury (46.3%) and fractures of long bones (47.5%). APACHE was 17.97 $\pm$ 7.6 and ISS 26.9 $\pm$ 11.8. Onset of ards was late (first 48 H) in 68%. Incidence of pneumonia was of 58.3 and 61% of the sample showed severe sepsis. Mortality was 28.7%. Patients with multiple organ failure (MOF), acute renal failure (ARF), early ards and severe traumatic brain injury had more probability of dying with significant statistical difference: OR for severe brain trauma was of 5.98(95% confidence intervel, 1.68-21.26), OR for early ards was 6.15(95% CI, 1.69-22.33), OR for ARF was 8.49(95% CI,2.28-31.57). The catheter-related infection, bacteraemia, sepsis and pneumonia are protectors from mortality. Septic shock is not associated with more mortality. Abdominal surgery and long bone fracture are protective from mortality also. Neither prone position, permissive hypercapnia, multiple transfusion, thoracic surgery, osteosynthesis, neurosurgery, abdominal, pelvic or thoracic injury nor sex influenced in ards mortality. Exitus had worse GCS, lower revised trauma score and PaO2/FiO2, greater FiO2, less days of mechanical ventilation and ICU LOS and greater SOFA. MOF is the more frequent cause of exitus in 48% and severe hypoxaemia was cause of exitus in 18%.

CONCLUSION. Ards is a marker of seriousness in severe trauma and it is defined by anatomic and physiologic indexes and by diagnosis-related groups presents in the hospital admission. Ards is late and it is characterized by high rates of infections and metabolic complications and high rates of mortality.

0091

DOES THE PARTIAL PRESSURE OF END-TIDAL CARBON DIOXIDE PREDICT IRREVERSIBLE DEATH IN THE FIELD

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INTRODUCTION. The outcome of prolonged resuscitative attempts cannot be predicted. The decision about when terminate resuscitative efforts for patients with cardiopulmonary arrest is often subjective. Therefore a method of predicting the outcome of out-of-hospital cardiac arrest (OHCA) is needed. The measurement of petCO2 could be used for reliably identification of irreversible cardiac arrest.

METHODS. Study was performed in 297(201 male) consecutive victims of normothermic, nontraumatic OHCA with nonshockable initial monitored rhythm (patients with post-defibrillation with similar rhythm were included). Once a patient was intubated, petCO2 and others parameters were measured every minute for first 5 minutes and than every 5 minutes for 20 minutes or until resuscitation efforts were terminated or patient was hospitalized. In this study, a hypothetical decision was made to cease resuscitative efforts based on petCO2 level of 1.33kPa or less after 20 minutes of advanced cardiac life support. The final outcome for all patients was classified as death in the field and survivor to hospital admission.

RESULTS. The average of intial petCO2 was significantly higher in survivors to hospital admission (2.6+/-0.9 vs. 0.9 +/- 0.8 kpa; p<0.01). After 20 minutes of advanced cardiac life support average of petCO2 was significantly higher in survivors (3.6+/-1.2vs.0.8+/-0.4kPa; p<0.001). Using the petCO2 of 1.33kPa or less as a theretical threshold to predict death in OHCA successfully discriminted between the 136(45.8%) survivors to hospital admission and 161 (54.2%) prehospital deaths. In 114 of the survivors (83.8%), the first evidence ofROSC, before palpable or blood pressure occured, was elevation of petCO2 (in average for 1.6 +/-0.5kPa). Sensitivity, specificity, positive predictive value and negative predictive value were all 100%.

CONCLUSION. Measurements of petCO2 can be used to accurately predict irreversible death in patients with nonshockable initial rhythm in OHCA, and should also be considered as a useful tool to allow the discontinuation of resuscitative efforts.

0092

PERCUTANEOUS TRACHEOSTOMY IN SURGICAL RESIDENCY PROGRAMS: RESULTS OF AN AMERICAN SURVEY

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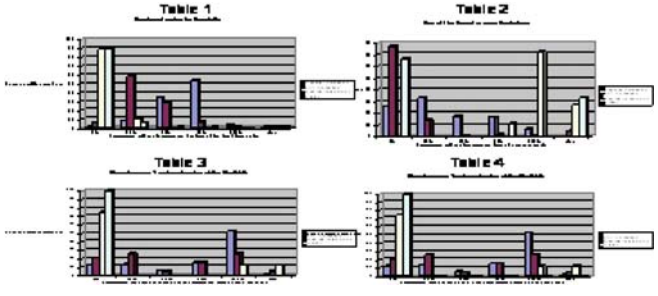
INTRODUCTION. Percutaneous Tracheostomy is gaining acceptance in American hospitals. A survey of surgical residency programs was conducted to gauge the use of percutaneous tracheostomy and its influence on surgical training.

METHODS. A survey was mailed to the director of every accredited general surgery residency in the United States. Recipients were asked to estimate the proportion of tracheostomies at their institutions performed by general surgeons, ENT surgeons, medical intensivists, or other specialists. They were asked to estimate the proportion done at the bedside and those done with bronchoscopy.

RESULTS. 115 (45.5%) of 253 program directors responded to the survey. See Tabels 1-4.



CONCLUSION. Most general surgery residencies have exposure to both open and percutaneous tracheostomy, but a significant minority has no exposure to the percutaneous technique. Only about half of respondants maximize the benefit of percutaneous tracheostomy by performing it at the bedside.

REFERENCE(S). Heikkinen M: Percutaneous dilational tracheostomy or conventional surgical tracheostomy? Crit Care Med - 01-MAY-2000; 28(5): 1399-402.
Friedman Y, Fildes J, Mizock B, et al: Comparison of percutaneous and surgical tracheostomies. Chest 1996; 110:480.

0093

CLINICAL FINDINGS CORRELATED WITH FORENSIC STUDY IN TWELVE CASES OF FIRE VICTIMS

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INTRODUCTION. Comparison between the clinical findings in the ICU with the cause of death established by forensic pathologists.

METHODS. On January 2005, 12 workers are involved in a fire, 7 die instantly. From the 5 taken to hospital, 3(*) die in the following days. On admission, aware of combustion of polyurethane that produces hydrogen cyanide gas (CN-), treatment with hydroxicobalamin is followed, sending blood samples to the National Toxicology Center.

RESULTS. In spite of the critical status on admission (table), none had severe burns. CO and HbCO are normal but CN- is high in 2 of the 3 death in ICU. We think that the main cause of death was CN- intoxication. The forensic pathologists confirm our assert studying the seven workers dead instantly in the fire. They all had CN- blood levels over 3mgr/L and HbCO less than 27%. Burns where similar in body surface and depth as the ones seen in the 5 patients. Neither there were severe burns in upper airways.

TABLE 1.

	Emergency Room	Upper Airway	Surface Area Burned	Brain CT Scan	CarboxiHb % (0-6)	Lactate mg/dl (4-19)	CN- mgr/L mortal>3
Patient 1*	C.P. arrest	No damage	10%	Edema+SAH	7.7	-	2.8
Patient 2*	C.P. arrest	No damage	10%	Not done	-	80.6	3.7
Patient 3*	Intubated	No damage	13%	Edema	0	16.2	0.17
Patient 4	Intubated	No damage	18%	Normal	6.2	11	0.20
Patient 5	Intubated	No damage	12%	Normal	13	18.8	0.37

** death in ICU, C.P. cardiopulmonary, SAH: subarachnoid hemorrage*

CONCLUSION. The cause of death was both hypoxic hipoxia (O2 consumption in ignition) and histotoxic hypoxia (CN-). Cyanide inhibits mitochondrial cytochrome oxidase creating multiorganic tissular hypoxia. From 10 to 46% of death in fires are because of CN-. Hydroxicobalamin is the best terapeutical option, based on risk/benefit, if used as soon as possible. So it is necessary: first, to know that every fire victim, as CO, must be considered as a CN- intoxicated and, secondly, to have antidote treatment ready in our ICUs.

REFERENCE(S). Dueñas A. Smoke intoxication in fires: vitamin based antidote treatment. Med Clin(Barc)2000;658-660.

0094

NASOPHARYNGEAL SELECTIVE BRAIN COOLING IN PIGS

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INTRODUCTION. Therapeutic hypothermia after cardiopulmonary resuscitation improves neurological outcome and reduces mortality (1, 2). The protective efficacy of brain cooling increases if hypothermia is introduced quickly after experimental brain ischemia (3). Also, selective brain hypothermia may prevent complications of systemic hypothermia especially if employed in traumatic brain injury. We therefore studied the feasibility and efficiency of a new non-invasive nasopharyngeal technique for induction of selective brain hypothermia.

METHODS. Twelve anaesthetised piglets were subjected to rapid induction of selective cerebral cooling and maintained for a period of 6 hours. Brain temperature was lowered with the help of bilaterally introduced nasal balloon catheters connected to a circuit in which chilled saline by means of a heat exchanger was circulated by cardioplegia pumps. External heating was used in order to keep normal body temperature. Temperature was measured in both cerebral hemispheres, rectal, oesophageal and in right atrium. The piglets were normoventilated and haemodynamic variables were continuously measured.

RESULTS. Cerebral hypothermia was induced rapidly and after the first 20 minutes the cerebral temperature was lowered with a mean gradient of 2.8˚C to a mean temperature of 35.3˚C. Meanwhile the central body temperature reflected by right atrium probe dropped with 0.5˚C to a mean temperature of 37.4˚C. After six hours brain temperature reached 34.7˚C while the central temperature was 36.2˚C (p=0.0038). The animals were haemodynamically stable during the whole period.

CONCLUSION. Inducing selective cerebral hypothermia with cold saline through nasopharyngeal balloon catheters is feasible, quick and effective. Furthermore the brain temperature was maintained at target temperature for six hours while the body temperature remained within normal range. This method may warrant further consideration for induction of fast and selective therapeutic cerebral hypothermia in humans.

REFERENCE(S). 1. N Engl J Med 2002:346:549–556.
2. N Engl J Med 2002:346:557–563.
3. Acta Neuropathol 1994:87:325-331.

0095

EFFICACY AND TOLERANCE OF HYPOTHERMIA AFTER CARDIAC ARREST USING AN ENDOVASCULAR COOLING SYSTEM

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INTRODUCTION. Mild induced hypothermia (MIH) improves neurological outcome of patients who sustained a cardiac arrest. Nevertheless, the optimal cooling system for performing MIH and its benefit/risk ratio remain unknown. We evaluated the efficacy and tolerance of a recently available internal cooling system (Coolgard®) in patients admitted after a cardiac arrest.

METHODS. During a 22-month period, all patients who underwent MIH using the Coolgard® system were studied. MIH was started as soon as possible after patient admission, target temperature was 33˚C, and temperature was subsequently increased at a rate of 0.3˚C per hour after 36 h of hypothermia. Recorded data were: SAPS 2 and neurological examination (Glasgow Coma Scale [GCS], papillary reflex, myoclonus) on admission and Cerebral Performance of Pittburgh (CPC) category at 6 months. Core temperature was monitored and MIH was considered steady when variations of core temperature were less than 0.4˚C. Potential side effects attributable to MIH or to the cooling system were recorded.

RESULTS. Among 69 patients admitted after a cardiac arrest during the study period, 34 patients underwent MIH (mean age: 56±17 years; SAPS2: 58±16; duration of anoxia: 12±9 min; cardiac origin: 65%; hypoxic origin: 35%). Upon admission, GCS was 4±1, papillary reflex and myoclonus were present in 32% and 21% of the cases, respectively. Target temperature was always reached after a mean time of 187±119 min (range: 30 to 600 min) and maintained steady in all patients for 36 h. Asymptomatic hypokalemia was frequently observed and postrewarming "rebound hyperthermia" (38.9±0.9˚C) was observed in 25 patients (74%) during the first 24 h which followed MIH. Three patients exhibited a bacteremia (Staphylococcus aureus). During follow-up (11±3 months), 10 patients (29%) had a favorable neurological outcome (CPC 1 or 2). No MIH characteristics (time to initiation, time to target temperature, duration of MIH, duration of the rewarming period) apparently altered neurological outcome.

CONCLUSION. Endovascular cooling system Coolgard® is effective in inducing and maintaining mild hypothermia (33˚C) in resuscitated patients after a cardiac arrest, without noticeable adverse effects. The potential relationship between the development of nosocomial infections and MIH remains to investigate.

0096

THE HEADACHE AND HEARTACHE OVER WARFARIN IN BRITISH NEURO INTENSIVE CARE UNITS

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INTRODUCTION. The acute and subsequent management of patients with spontaneous intracerebral haemorrhage (ICH) who require long-term oral anticoagulation (OAC) presents a therapeutic dilemma. The available evidence comes from many specialties, and is disparate. The aim of this study was to ascertain current UK practice regarding the management of this difficult group of patients.

METHODS. We contacted the duty consultant of all 32 UK Neuroscience Intensive Care Units (NICU) by telephone, and asked standardised questions regarding their usual management of anticoagulated patients who suffer a spontaneous ICH. We subsequently conducted a literature search to establish an evidence base to guide future recommendations.

RESULTS. 16 units were stand alone NICU (50%). 14(44%) of the consultants have a lead role in their ICU. 23(72%) use FFP for reversal of OAC and 3 use Factor VIIa - none of these units have a protocol. 12 units use Prothrombin Complex Concentrate (PCC) and 8 also use IV vitamin K. 5 units have an established protocol for OAC reversal in ICH, 4 of these use PCC and vitamin K. Over 90% would normalise INR for DVT, PE, chronic stable AF (CSAF) and paroxysmal AF (PAF) but only 56% in patients with mechanical heart valves (MHV). 66% would commence IV heparin in the first 4 days for MHV, 16% for PAF, 16% for CSAF and 9% for PE. 94% would restart OAC for MHV, 19% for PAF,16% for CSAF and 9% for PE. Following ICH 25% would recommence OAC between 2 and 7 days and 69% after 7 days.

CONCLUSION. There is considerable variation in practice amongst senior clinicians who regularly manage these patients. We found practice to be inconsistent across the units surveyed, and in many cases not evidence based. The literature would support that early aggressive reversal of the INR to within the normal range with PCC and IV vitamin K improves outcome. The risk of systemic embolisation, even with mechanical heart valves, is low at 0.016% per day and temporary cessation of all anticoagulation is safe for 8-14 days. Furthermore, the risk of recurrent haemorrhage after reintroduction of OAC is low. The literature does not support the use of IV heparin in the acute phase, or factor VIIa for reversal in patients receiving OAC. There is an urgent need for national guidelines regarding the management of these patients.

REFERENCE(S). Hanley JP. J Clin Pathol 2004;57:1132-39.
Butler AC, Tait RC. Blood Reviews 1998;12:35-44.

0097

DETERMINING FACTORS OF MORTALITY AND FUNCTIONAL OUTCOME IN SPONTANEOUS INTRACEREBRAL HEMORRHAGE

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INTRODUCTION. Intracerebral hemorrhage (ICH) represents 10-30% of all strokes. Epidemiological studies have shown factors associated with its high mortality. Factors associated with morbidity are little known. The aim of our study was to find the factors (risk factors, clinical, laboratory and neuroimaging parameters) obtained on admission which may influence the mortality and functional outcome.

METHODS. We made a prospective study of patients with spontaneous ICH admitted in the Intensive Care Unit (ICU) during 2003. On admission we recorded vascular risk factors (high blood pressure, diabetes mellitus), clinical parameters (arterial blood pressure, Glasgow Coma Scale score (GCS), body temperature), laboratory parameters (leucocytes, platelet counts, prothrombin time) and neuroimaging parameters (ventricular hemorrhage, subarachnoid hemorrhage, swelling, herniation brain, volume of ICH interpreted by a neuroradiologist using computed tomography (CT)). Mortality and its predictive factors were determined after 30-day and one year using univariate and multivariate statistical analysis. The functional outcome when discharged from the ICU after one year were evaluated by the Glasgow Outcome Scale (GOS), Barthel Index (BI) and Modified Rankin Scale (mRS).

RESULTS. 66 patients were identified (43 males, 23 females). The 30-day mortality was 44% and at one year 57%. Most patients died within the first seven days. Age and initial GCS were the strongest independent predictive factors of 30-day mortality for all locations ($p<0.001$); mortality was correctly predicted (sensitivity of 76%, specificity of 73%). Age, GCS and volume of ICH on admission were the strongest independent predictive factors of mortality after one year for all locations ($p<0.005$); mortality was correctly predicted (sensitivity of 87%, specificity of 75%). Global percentage prognosticated was exactly 81%. At the time of the ICU discharge, only 22% had good functional condition and were independent as evaluated by the GOS and 24% by the BI and mRS. Of the patients who survived after one year, 75% were independent as evaluated by the GOS and the BI and 68% evaluated on the mRS. After one year, the global improvement was estimated at 50%; age and initial volume were the two most important functional prognosis predictors ($p<0.05$).

CONCLUSION. On admission at the ICU, age of the patient, in combination with the initial GCS were the two most powerful and easiest predictors of 30-day mortality and morbidity in patients with spontaneous ICH; age, GCS and volume of hemorrhage were after one year. The functional outcome was better in younger patients and smaller haematomas on CT on admission.

0098

MORTALITY AUDIT OF SEVERELY HEAD INJURED PATIENTS ADMITTED TO THE QUEENS MEDICAL CENTRE

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INTRODUCTION. The Virginia Prediction Tree (VPT) uses four variables (pupilary response, age, Glasgow Coma Scale Motor Score (GCS-MS) and the presence or absence of an intracranial mass lesion) to allocate patients into eight groups each with a specific outcome profile [1]. While this has been used to predict prognosis in individual patients, it also provides a method for comparing the outcome of two similar groups of patients in whom the above variables are known.

METHODS. Data was collected prospectively on all patents admitted with severe head injuries (GCS <9, GCS-MS <6) for ten years (1993-2002). 759 out of 794 patients had a Glasgow Outcome Score (GOS) recorded at one year. These patients were divided into eight groups using the VPT. The Standardized Mortality Ratio (SMR) was calculated for each group using the expected and actual number of deaths in each group.

RESULTS. 759 adult patients studied, 77% male, mean age 39 yrs, mean GCS total score 5.8.

TABLE 1.

Subgroup	Number of patients	Expected no of deaths	Actual no of deaths	SMR
1	94	5.17	13	2.51
2	82	4.51	9	2.00
3	81	24.30	24	0.99
4	22	5.41	7	1.29
5	167	57.78	71	1.23
6	50	34.05	22	0.65
7	60	41.52	34	0.82
8	203	157.73	144	0.91
TOTAL	759	330.48	324	0.98

CONCLUSION. The overall one year mortality for our patients was similar to that of the Virginian series. The higher SMR for subgroups 1, 2, 4 and 5 may be explained by the presence of severe extra cranial injuries in some of these patients. We believe this method provides a simple method of audit for comparable groups.

REFERENCE(S). 1. Choi SC, et al: Prediction tree for severely head injured patients. J Neurosurg 75:251-255, 1991.

0099

ASSESSMENT OF PATIENTS WITH NONCONVULSIVE STATUS EPILEPTICUS IN AN ADULT SURGICAL ICU

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INTRODUCTION. The mortality rate among adults with status epilepticus (SE) is high. SE lasting more than 30 to 45 minutes can cause cerebral injury. Seizures itself are sufficient to damage central nervous system. Hospitalized comatose patients with acute processes that cause SE like metabolic or secondary disturbances (sepis, anoxia, uremia, etc), head trauma, cerebrovascular disease and cerebral system infection may have electrographic status epilepticus with little or no motor activity - nonconvulsive status epilepticus (NCSE)

METHODS. From February 2005 to March 2006 in the Surgical ICU we prospectively included unresponsive patients who NCSE was possible and electroencephalography (eeg) was required. The exclusion criteria was patients with history of epilepsy, recent convulsion/NCSE or brain death investigation. Data collected from the patients: age, gender, APACHE II, Glasgow coma score (gcs), cause of brain injury, lenght of hospital stay (LOS), eeg pattern and death.

RESULTS. We included 60 consecutive patients: 36 Male (60%); Mean age 58 years (14-93); Mean APACHE II 14.6±5.4; Mean GCS 9(3-15). The brain injury causes: Secondary 23 (38.3%); Brain Trauma 18 (30%); Hemorrhagic Stroke 15(25%) and Ischemic Stroke/Neoplasm 2 (3.3%) each one. LOS was 15 days (2-74) and 16 patients died in the hospital (26.6%). The most common eeg patterns was sedation in 26 patients (43.3%) and NCSE in 20 patients (33.3%).
The NCSE patients mortality was 40%.

CONCLUSION. In a population of uresponsive surgical patients NCSE is a frequent condition and must be always remembered. The mortality in this group is high.
Larger studies may be done to evaluate the NCSE as an independent cause of death in coma patients.

0100

THE VALIDITY OF NEAR-PATIENT ESTIMATION OF SERUM OSMOLALITY FOR SUSPECTED DI FOLLOWING BRAIN INJURY

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INTRODUCTION. Prospective clinical audit to discover if routine near-patient estimated serum osmolality can be used interchangeably with a gold standard (laboratory measured values) to help uncover Central DI (Diabetes Insipidus) in neurointensive care patients with severe brain injury who are free from hypertonic solute infusions.

METHODS. 32 adult neurointensive care patients with severe traumatic and ischaemic brain injury were identified over period of four months. Anonymised laboratory identification was based on the need for laboratory serum electrolytes, urea and osmolality measured for suspected Central DI and in the absence of mannitol or hypertonic saline therapy over the previous 8 hours. Serum osmolality was estimated using the formula 2x Na + Blood urea + Glucose (mOsm/kg)[2]. Serum osmolality was measured using Advanced Instruments Micro Osmometer, Model 3300. We assessed the bias and limits of agreement of the two methods for determining serum osmolality using Bland and Altman's technique [3].

RESULTS. We found good correlation between measured and calculated osmolalities with r = 0.907 (r^2 = 0.823). However, Bland-Altman analysis revealed a bias of -2.45 (±6.21mOsm/kg SD) and limits of agreement from -14.6 to 9.72 mOsm/kg. Excluding patients with evidence of renal dysfunction (6 patients, serum creatinine > 110µmol/l), the bias was -2.57(±3.37mOsm/kg SD) with limits of agreement from -9.2 to 4.0 mOsm/kg.

CONCLUSION. Our clinical audit suggests that estimated and measured serum osmolality can not be used interchangeably for neuroinjured patients on intensive care unless they have normal renal biochemistry in the absence of hypertonic solute therapies. Estimated serum osmolality appears to have limited validity for use in the near-patient diagnosis of Central DI in critically ill patients following severe brain injury.

REFERENCE(S). 1. Boughey et al. 2004 Am Surg. Jun; 70(6):500-3.
2. Vialet R et al. 2005 Journal of Neurosurgical Anesthesiology. 17(2):106-9.
3. J M Bland, D G Altman. The Lancet, Feb 8, 1986: 307-310.

0101

EFFECT OF BARBITURATE COMA ON ADRENAL RESPONSE IN PATIENTS WITH TRAUMATIC BRAIN INJURY

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INTRODUCTION. Barbiturate coma is the second tier measure recommended by guidelines to treat posttraumatic refractory intracranial pressure. Hypotension constitutes its most important side effect. Recent evidence suggests that low dose corticosteroid therapy may be used in determined subsets of patients with traumatic brain injury (TBI) to avoid hypotension. We evaluated adrenal function in TBI patients undergoing barbiturate coma as treatment of their refractory intracranial hypertension.

METHODS. We prospectively studied 40 patients with moderate to severe TBI. Group A (17 patients) were treated with barbiturate coma. Group B (23 patients) presented intracranial hypertension controlled with first tier measures. Adrenal function was evaluated by using the high-dose corticotropin stimulation test at 24 hours after brain injury and after barbiturate coma induction.

RESULTS. Both groups were comparable in baseline caractheristics. After 24 hours of TBI, adrenal function was similar in both groups. After barbiturate coma was induced, patients in the group A presented a higher incidence of adrenal insufficiency compared with group B (53% vs. 22%, p=0.03). Patients treated with barbiturates who developed adrenal insufficiency required higher doses of norepinephrine to maintain cerebral perfussion pressure than patients treated with barbiturates without adrenal insufficiency (1.07 ± 1.04 µg/kg/min vs. 0.31 ± 0.32 µg/kg/min, p= 0.03).

CONCLUSION. Patients with TBI treated with barbiturate coma are at higher risk to develop adrenal insufficiency. This subset of patients presented higher requirements of vasoactive support to avoid hypotension. In these patients corticosteroid therapy may play a role in the treatment of barbiturates-associated hemodynamic instability.

REFERENCE(S).
1. Bernard F, Outtrim J, Menon D K, et al. Br J Anaesth 2006; 96: 72-76.
2. Llompart-Pou J A, Raurich J M, Ibáñez J, et al. J Trauma (in press).
3. Cohan P, Wang C, McArthur D L, et al. Crit Care Med 2005; 33:2358-2366.

Poster Sessions
Quality improvement 0102-0115

0102

MONITORING OF ICU PERFORMANCE USING CUMULATIVE RISK-ADJUSTED 30/60/90-DAY MORTALITY (CRAM-30/60/90)

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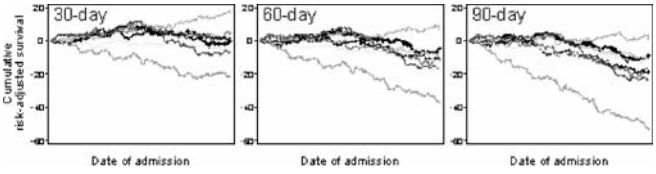
INTRODUCTION. Risk-adjusted hospital outcome is a common quality indicator in the ICU although outcome measures are perceived to be less useful than process measures (1), and critical illness influences outcome beyond hospital discharge (2). The purpose of this work was to explore the use of CRAM-30/60/90 to examine ICU performance.

METHODS. 5341 admissions during 2004 to 8 ICUs in the Swedish Intensive Care Registry (SIR) with >95% complete APACHE II risk-adjustment were included. All data were imported electronically to SIR after local and central validation. Vital status was secured from a national database. CRAM (3) by admission dates were generated per ICU.

RESULTS. Changes over time within ICUs and differences between ICUs were displayed clearly enough to trigger formative discussions in our ICU-network. The appearances of 30-, 60- and 90-day cumulative survival charts were very similar.



CONCLUSION. CRAM may be a useful method of combining monitoring of health care processes and outcome following critical illness. The choice of outcome variable must balance between providing rapid feed-back and being clinically meaningful.

REFERENCE(S). 1. Pronovost et al, J Crit Care 2003; 18: 145-55, 2. Angus et al, Intensive Care Med 2003; 29: 368-77, 3. Poloniecki, B M J 1998; 316: 1697-1700.

0103

REDUCTION IN DISCREPANCIES BETWEEN CLINICAL AND POST MORTEM DIAGNOSES OVER TEN YEARS IN AN ITU

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INTRODUCTION. Previous studies have highlighted discrepancies between clinical diagnoses and post mortem findings in the intensive care unit [1]. The aim of the study was to determine whether or not there had been a change in the frequency of such discrepancies over two consecutive five year periods (1995-2000 and 2001-2005) in a 14 bedded critical care unit.

METHODS. Records from post mortem examinations were compared with clinical records, from 1995 - 2005. Any discrepancies were classified using the Goldman system. A Goldman type I error is a missed major diagnoses that would have altered therapy and possibly survival. A Goldman type II error is a missed major diagnosis with equivocal impact on survival. Data were split into two consecutive five year periods for analysis.

RESULTS. A total of 7,202 patients were admitted to our unit over the 10 year period. Of these, 1,343 died and 88(6.6%) underwent post mortem examination. There was a reduction in Goldman type I errors from 10 (21%) in 1995-2000 to 4 (10%) in the period 2001-2005 (table 1).

TABLE 1.

Goldman type diagnostic errors. (n = number of post mortems in a 5 yr period)

	1995 - 2005 (n=48)	2001 - 2005 (n=40)
Type I error	10 (21%)	4 (10%)
Type II error	16 (33%)	23 (58%)
No error	22 (46%)	13 (32%)

CONCLUSION. This is the first analysis of changes in rates of diagnostic errors over time in an intensive care unit. The study shows a reduction in important Goldman type I diagnostic discrepancies in intensive care patients who underwent a post mortem examination in the period 2001-2005 compared with the preceding five years. There may be several reasons for this reduction. Our unit has doubled the number of consultant intensivists from two to four. In addition, patients are now managed by multidisciplinary teams. Increased use of diagnostic radiology may have played a role. We plan to increase our use of post mortem examination to further audit diagnostic performance, and to further examine the reasons for the apparent improvement in diagnostic accuracy.

REFERENCE(S). 1. Dimopoulos G, Piagnerelli M, Berre J, Salmon I, Vincent J L. Post mortem examination in the intensive care unit: still useful? *Intensive Care Med* 2004; 30(11): 2080-5.

0104

THE DUTCH QUALITY INDICATOR AND IMPROVEMENT PROJECT: RESULTS FROM A PILOT STUDY IN 18 IC DEPARTMENTS

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INTRODUCTION. The Dutch Society of Intensive Care Medicine developed a set of quality indicators (QI) to measure continuously the quality of care in an individual ICU, to evaluate quality improvement programs and to benchmark [1]. The ultimate goal is to improve the quality of care in Dutch ICU's. Quality of care is defined in several domains which are all covered by our comprehensive set of indicators. The process of QI development was described before [1]. Here we report the results of a pilot study to the feasibility of registration, the reliability and validity of the QI.

METHODS. Physicians and nurses were trained to collect uniformly all data for the 12 QI: availability of intensivists (hours per day), patient to nurse ratio (three times daily), strategy to prevent medication errors (10 items yes/no), measurement of patient and family satisfaction (yes/no), length of ICU stay, duration of ventilation, absolute number of interclinical transport, % of days with all ICU beds occupied, % of glucose measurements above 8 or below 2.2 mmol/l, standardised mortality (APACHE II), incidence of decubitus, number of unplanned extubations (per 100 ventilation days). Data were collected locally and transferred to a national database. Site visits, interviews and written question lists were used.

RESULTS. One ICU was not able to implement the data collection in daily routine. 17% of ICU's needed more than 60 min per day to collect the items, 37% 30-60 min and 46% less than 30 min per day. The pilot covered 7682 admissions and 31849 treatment days (of which 16860 ventilated). Interclinical transport was the least reliable collected item. All other indicators showed significant variability (data not shown here) to serve as a target for quality improvement programs. Multilevel and regression analyses are being developed to relate the results of different indicators and to improve insight in the validity of the set.

CONCLUSION. This set of indicators gives a quick view of the quality of care in individual ICU departments. However, computerised assistance is necessary to limit the registration workload. The set shows what the focus of future quality improvement programs should be both on local and national level.

REFERENCE(S). [1] Van der Voort P H J. 2005 Intensive Care Med 31(Suppl1):S729.

0105

DO PERIODIC AUDITS IMPROVE QUALITY OF CARE IN ICU?

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INTRODUCTION. Improving quality of care (QOC) is an important activity of all members of a critical care team. We decided to determine if periodic audits help improve the QOC in ICU.

METHODS. We started an ICU audit in September 2005 including all patients with an ICU LOS of more than 48 hrs and focussing on key indicators within two QOC components viz process and outcome. Process measures analyzed were DVT prophylaxis (DVTP), stress ulcer prophylaxis (SUP), head end elevation (HEE), EGDT in sepsis, steroid use in septic shock and glycemic control (GC). Outcome measures audited were standardized mortality ratio (SMR), unplanned extubation (UE), VAP and CRBSI rates. Statistical analysis was with chi-square test using SPSS 11.5 V.

RESULTS. There were 321 evaluable patients. Parameters below showed no statistically significant difference.

TABLE 1.

Adherence to process measures (%)

	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06
DVTP	78.8	84.1	86.8	81.4	89.1	84.1	85.7
SUP	93.9	90.9	92.5	90.7	90.9	90.9	91.8
HEE	100	97.7	100	97.7	98.2	100	100
EGDT	66.7	51.5	78	83.3	78.9	85.7	86.2
STEROIDS	91.7	90.5	90.6	94.7	93.3	90.9	95.2
GC	66.7	68.2	77.4	69.8	58.2	88.6	83.7

TABLE 2.

Adherence to outcome measures

	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06
UE(%)	3	2	4	2	4	3	2
VAP/1000VD	15.46	17.8	11.11	9.80	18.69	20.8	11.6
CBSI/1000CD	7.93	12.9	14.1	15.03	8.26	11.9	0
SMR	1.3	1.1	1.2	1.2	1.1	1.0	1.1

VD - Ventilator days, CD - Catheter days

CONCLUSION. Periodic audits showed a trend towards improving QOC. However we need to further intensify our efforts to acheive a significantly higher standard of care.

0106

EVIDENCE-BASED MEDICINE IN THE ICU: MULTICENTER RCT SHOWING DECREASED MORTALITY IN INTENSIVE CARE

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INTRODUCTION. In evidence based medicine, the randomized controlled trial (RCT) is the "gold standard" to support therapeutic decisions. In Intensive Care Medicine such studies focus on mortality as the primary outcome. However, there is a shortage of such multicenter studies.

METHODS. We conducted a systematic search for all publications of adult multicenter RCTs carried out in the ICU and focusing on mortality as a primary end-point. We searched MedLine and the Cochrane Central Register of Controlled Trials (CENTRAL) for all publications up to March 15, 2006, using the keywords: Intensive Care OR critical care OR Critically ill OR sepsis OR mechanical ventilation OR ARDS AND randomized controlled trial AND multicenter.

RESULTS. A total of 1878 articles were found in the two databases: 1094 in MedLine and 784 in CENTRAL; 688 articles were present in both. We excluded the folowing: 1. Non-multicenter studies, retrospective or subgroup analysis of another study, letters and editorials (N=281); 2. Studies not related to critical care patients (N=403); 3. Pediatric studies (N=202); 4. Studies not having mortality as primary outcome (N=236); 5. Studies with mortality as the primary outcome but less than 50 patients (N=2). A total of 66 multicenter RCTs in critical care patients with mortality as primary outcome were therefore identified. Of these, only 8 showed a positive impact on mortality: dotrecogin alfa (activated) in severe sepsis; protective ventilatory strategy in ARDS; low tidal volumes in ARDS; non-invasive ventilation in exacerbations of COPD; PC-Ventilation in ARDS; high-volume hemofiltration after out-of-hospital cardiac arrest; non-invasive strategies for management of suspected VAP; low dose steroids in severe sepsis. Five of the studies reported a negative impact on mortality: growth hormone in critically ill patients; hemoglobin solution in hemorrhagic shock; non-invasive positive-pressure ventilation for respiratory failure after extubation; TNFr in septic shock; NO synthase inhibitor in septic shock. The other 53 studies showed no effect on mortality, although this neutral group includes some studies which have had considerable impact on ICU-decision making (e.g., transfusion tresholds in ICU, albumin vs. crystalloids in resuscitation, use of pulmonary artery catheter, normal SvO_2 goal-directed therapy in critically ill patients).

CONCLUSION. This literature search highlights the difficulties in demostrating a positive impact of an intervention on the survival of critically ill patients in multicenter RCTs.

0107

IMPACT OF PROCESS OPTIMIZATION (PO) ON VENTILATION OUTCOMES IN AN INTENSIVE CARE UNIT (ICU)

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INTRODUCTION. In 2002, a number of PO measures were implemented in the 10-bed ICU of the Sana-Krankenhaus Ruegen comprising the implementation of a standardized concept for mechanical ventilation including replacement of fentanyl/midazolam (FM) by remifentanil/propofol (RP) throughout for analgosedation of ventilated patients, optimization of diagnostic procedures, expansion of renal replacement therapies, improved management of treatment courses, and standardization of medical devices. The aim of this study was to determine the impact of the PO on total case-related treatment costs (CRTC) and on mechanical ventilation outcomes.

METHODS. We retrospectively analysed and compared the routinely documented data on baseline characteristics, treatment, and outcomes of the ICU cases within 2 intervals, INT1: before PO with years 2000-2001, and INT2: after PO with years 2003-2004. The target variables were given by total CRTC in prices of 2004 and by length of stay (LOS) of mechanically ventilated cases (MVC). Differences between INT2 and INT1 were regarded significant with a p value of < 0.05.

RESULTS. A total of 2044 and 1704 cases were treated in INT2 and INT1, respectively. There were no significant differences between the intervals with respect to baseline characteristics, distribution of intensive treatment to monitoring, ventilation days, and case-related mortality. Though cost for RP were 2.8-fold of that for FM, total CRTC significantly dropped by 25% from 2435 € to 1815 €, comprising staff expenses, cost for medical need, and laboratory cost, which dropped from 1656 € to 1238 €, from 718 € to 536 €, and from 60 € to 41 €, respectively, each per case. In the subgroup of MVC >/= 4 days, there were significant differences in baseline characteristics: the 135 cases in INT2 were significantly older (median 67 vs 63 years) and more severely ill measured by APACHE II score (median 21 vs 18 per case) than the 129 cases in INT1. However, there were no significant differences in outcomes: the median sum of simplified Therapeutic Intervention Scoring System-28 points per case was 498 and 495, respectively, and the median LOS per case was 14 days each.

CONCLUSION. 1) The whole PO made the ICU more efficient. 2) The throughout use of RP embedded in a comprehensive PO strategy can result in savings of CRTC in the ICU.

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0108

IMPLEMENTATION OF A NURSE-DIRECTED SEDATION PROTOCOL WITH DAILY AWAKENING IN THE ICU: A PILOT STUDY

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INTRODUCTION. There is considerable variation in the way sedatives and analgesics are prescribed in our intensive care unit (ICU). Recently, protocol-based administration of IV sedation have been shown to reduce duration of mechanical ventilation, ICU and hospital length-of-stay, need for tracheostomy and number of neurologic tests required to evaluate persistent coma. We tested the feasibility of implementing a nurse-directed sedation protocol in our ICU.

METHODS. A recently described sedation algorithm with daily awakening was discussed and modified by a multi-disciplinary ICU group. Prior to implementation of the protocol, a formal training program consisting of didactic lectures and hands-on training (on the application of the algorithm and assessment of level of sedation utilizing the Sedation-Agitation Scale) was conducted. Compliance, protocol violations and safety were evaluated.

RESULTS. Thirty one mechanically ventilated patients requiring IV sedation were evaluated. Seventeen patients (54.8%) were sedated according to protocol. Fourteen patients (45.2%) were excluded from the protocol (7 - use of neuromuscular blocking agents, 3 - post cardiac arrest, 3 - physician preference, 1 - status epilepticus). Protocol violations occurred in 9 patients (52.9%)(6 - physician preference, 3 - incorrect titration, 2 - daily awakening omitted inadvertently). Two patients had more than one protocol violation. The most common reasons cited by physicians who preferred to deviate from protocol were patient-ventilator dyssynchrony and inability to quickly achieve required level of sedation. No adverse events eg. unplanned extubation, accidental removal of lines or acute withdrawal were observed.

CONCLUSION. This pilot study highlights the difficulties encountered in implementing evidence-based protocols in the ICU. Frequent evaluation of the protocol, in conjunction with close consultation with team members, is often needed during the implementation phase.

0109

SEVERITY-ADJUSTED OUTCOME AFTER C.P.O.E. IMPLEMENTATION

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INTRODUCTION. While benefits are usually ascribed to implementing Computerized Physician Order Entry (CPOE) systems (1), others have noted unexpected mortality (2). We examined ICU outcomes one year preceding and following transition on 1/16/05 from a legacy CPOE system (E7000, Eclipsys Corp. Boca Raton FL,) to Cerner Millenium (Kansas City, MO) CPOE in a 24-bed mixed medical-surgical ICU.

METHODS. Order sets in the legacy CPOE system were reviewed and updated. Drug allergy checking, drug-drug interaction and dose range checking were introduced with the new system. Project IMPACT data, using a 50% random sampling, was retrospectively reviewed. Mortality outcomes were adjusted using the Simplified Acute Physiology Score (SAPS-II) and the Mortality Probability Model (MPM-II). Rapoport-Teres methodology (3) was used to severity-adjust hospital length-of-stay (HLOS). Univariate testing (t and z) was used, with $p<0.05$ considered significant.

RESULTS. Hospital survival for ICU patients did not significantly change (80.2% pre; 81.1% post). Survival predictions were 69% pre and 73% post by MPM-II or SAPS-II ($p=0.025$). No significant differences in occurrence of ARDS, DVT, GI Bleeding, ARF, HITT, MI or ICU deaths were noted; VAP incidence apparently increased to 2.6% from 0.6%, but coincided with increased surveillance. Unadjusted ICU LOS (5.5 to 4.5 days) and hospital LOS (16.3 to 14.1 days) decreased ($p<0.012$), but the change was not significant when adjusted for severity of illness by Rapoport-Teres methodology.

CONCLUSION. Introduction of a CPOE system including new medication-related clinical decision support alerts, did not change ICU complications, severity-adjusted mortality or hospital LOS in an ICU with prior CPOE experience.

REFERENCE(S). (1) Mekhjian HS et al; J Am Med Inform Assoc 2002; 9:529-539. (2) Han YY et al; Pediatrics 2005 116:1506-1512. (3) Rapoport et al: Crit Care Med 1994 22: 1385-1391.

0110

A PRACTICAL APPROACH TO NURSE DRIVEN QUALITY CONTROL AND IMPLEMENTATION OF CLINICAL ROUTINES

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INTRODUCTION. Adverse events are a common feature in intensive care. Such events and failure to adapt, implement and comply with EBM based guidelines reduce the efficacy of critical care. However, proper implementation and monitoring of such guidelines has been shown to have an influence on ICU morbidity and outcome (1,2. It has also been shown that ICU outcome and incidents are related to workload and staffing patterns (3). In this paper we present a practical example on how routine clinical education activities and individual reporting can propel nurse driven monitoring of clinical procedures and incidents and how clinical performance, feed back and reporting are integrated in daily activities.

METHODS. All ICU incidents are reported in a digitalised format and processed according to the nature and seriousness of the incident. Data input comes from unit regular activities as well as from individual reporting. These activities are: CASE method driven staff education sessions were present cases are reviewed, grand rounds and M&M conferences. The incidents are registered and presented at a monthly audit and significant incidents are analysed and presented in a "time scale format" where the temporal course of the incident is illuminated. Incident/workload ratios are used to show effects of routine revisions and unit occupancy.

RESULTS. The nurse driven incident and protocol revision system are a highly efficient tool for early and prompt recognition of malfunctioning routines as well as for implementations of new guidelines and revisions of departmental routines. It is sensitive for detecting errors in unit performance and promotes understanding and compliance with unit medical procedures. The form used for implementation:CASE, Interactive learning programs; TILDA (Tool for Interactive Learning in Daily Activities) and staff meetings ensures an expedient feed back system and a high unit impact factor.

CONCLUSION. Nurse driven quality surveillance implemented by interactive feed back sessions has a high impact factor on unit performance and for early detection of malfunctioning routines.

REFERENCE(S). Garland A. Improving ICU I Chest.2005;127:2151-2164.
Garland A. Improving ICU II Chest.2005;127:2165-2179.
Lapichino G et al. Volume of activity and occupancy rate in intensive care units. Association with mortality. Intensive Care Med.2004;30:290-297.

0111

EVIDENCE-BASED DRUG CHOICE MANAGEMENT PROGRAM: IMPACT ON QUALITY OF CARE IN AN INTENSIVE CARE UNIT

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INTRODUCTION. Evidence-based medicine has been a tool to improve the quality of care of ICU patients and to achieve better outcomes. We believe protocols regarding evidence based drug choices could improve quality of care, and a Management Program is essential to assure good results of the process.

METHODS. We promoted several meetings with the medical staff from January to April 2005, discussing ten issues related to drugs choice and costs and established evidence-based protocols. From August 1st to October 7th, we daily checked the staff adherence, by medical prescriptions, to 4 protocols: deep vein thrombosis (DVT) prophylaxis, use of vasopressors on sepsis, gastrointestinal tract bleeding (GIB) prophylaxis, and red blood cells (RBC) transfusion. We then checked the drug consumption related to the protocols, as well as the mortality rates and the APACHE II score.

RESULTS. The staff adherence to protocols was: DVT prophylaxis – 92.5%; Vasopressors in sepsis - 99.2%; GIB prophylaxis – 98.5%; RBC transfusion – 100%. The enoxaparin use fell on the second semester from 1.03 to 0.82 vial/patient-day, the non- fractioned heparin rose from 0.1 to 0.27 vial/patient-day. The dopamine use rose from 0.17 to 0.58 vial/patient-day, even though there was no reduction on the noradrenalin use. The ranitidine use was unaltered (0.89 to 0.88 vial/patient-day), and the proton pump inhibitor use rose from 0.25 to 0.33 vial/patient-day. The mean APACHE II Score on the first and second semesters were 11.9 and 8.4, and the mortality rate on the ICU, similar to the risk estimated by the APACHE II, was 6.34 and 5.51%, respectively.

CONCLUSION. The strategy of training, daily follow up of the process, and checking the staff adherence to protocols was crucial to change behaviors sometimes deeply grounded in the medical culture, although poorly evidence based. Additionally, however, we observed an adherence rate reduction along the verification time. Conclusions on the drug consumption should consider the drug use non-related to the protocols in the study period. There was no significant change on the mortality between the semesters. The implementation of a quality process, based on the PDCA tools, planning the strategy of action, followed by results checking, helped us accomplish our drug choice change and reducing cost goals, without any decrease in quality of care.

REFERENCE(S). Knaus WA, et al., APACHE II: a severity of disease classification system. Crit Care Med. 1985 Oct;13(10):818-29.

0112

QUALITY OF CARE ON THE INTENSIVE CARE UNIT

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INTRODUCTION. ICU outcome has been well studied with respect to mortality. There are few standards regarding symptomatology and quality of care. The aim of this study was for patients to measure their ICU symptom severity and the quality of ICU care they received.

METHODS. A questionnaire was designed based on Boynton and Heyland. All discharged patients were included in the study if they were alert, gave verbal consent and had ICU recall 3-4 days after ICU discharge during an 8 week period. Patients were surveyed by a medical student not involved with or aware of the ICU care provided.

RESULTS. 42 patients were questioned with 25 excluded. Consequently 90% questioned were surgical patients. Pain was experienced by 76%, dreams/hallucinations by 55% and sleep disturbance by 72%. Analgesia was however considered sufficient by 98%.

TABLE 1.

	Symptom experience /10	Care provided /5
Pain	5 (5-7)	5 (5-5)
Poor sleep	5 (5-7)	n/a
Hunger	2 (2-2)	4 (4-5)
Thirst	2 (2-4.8)	4 (4-4)
Breathlessness	2 (2-4)	4 (4-4.3)

Interquartile range in brackets

CONCLUSION. Pain control and sleep quality are the main care quality issues for patients during their ICU stay although 98% also said that their analgesia was sufficient. Standards set by Heyland were met for alleviation of pain and breathlessness. Questionnaires need to be developed with standards set for quality of care which are reliable and determined by the patient.

REFERENCE(S). 1. Boynton P et al BMJ 2004;328:1372-5 2. Heyland D et al Crit Care Med 2002;30:1413-8.

0113

COMPARISON OF CLINICAL AND AUTOPSY RESULTS IN A MULTIDISCIPLINARY INTENSIVE CARE UNIT

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INTRODUCTION. The importance of autopsies both from scientific and teaching standpoints is out of a doubt, but there are some discrepancies about their value in Intensive Care (1,2). Our aim was to establish a clinical – pathologic correlation of findings in necropsies of patients admitted to our ICU.

METHODS. This is a retrospective study on necroptic studies performed since 2000 to 2004, establishing relations between autopsy findings and reason for hospital and ICU admission, the quoted reasons for death (clinical documentation) and the possible changes in diagnosis or therapy strategies that could be conditions if the necroptic information was known during patients life. This possible influence was separately analyzed by two independent physicians with a similar experience.

RESULTS. Out of 744 deaths during the period, 61 autopsies were performed (8%) with 51 complete and available reports. Forty six of these reports (90%) showed a good correlation between clinical and necroptic quoted causes of death. Postmortem findings would represent changes in treatment in 10 cases, with possible longer life. In 27 cases, no discrepancies were found between diagnosis pre and postmortem. Both experts correlation did not show significant differences (x2) except for the importance on necroptic findings for changing the clinical diagnosis.

CONCLUSION. Necroptic studies in our series do represent a poor added value with respect to clinical orientation. In our experience there is some discrepancy when comparing the quality control value of autopsies with their teaching and clinical meaning.

REFERENCE(S). 1.- A. Esteban, Intens Care Med 2003, 29:522- 525.
2.- F. Lemaire, Intens Care Med 2003, 29: 518 - 521.

0114

COMPLAINTS AND DEMANDS IN A INTENSIVE CARE UNIT

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INTRODUCTION. To analyze importance of complaints and malpractice claims in an ICU and the characteristics of the patients who present them.

METHODS. Prospective cohorts study in ICU during 1 year. Two groups of patients "A" and "B" according to made or not complaints. We recorded epidemiological characteristics length of stay, mortality, APACHE II, disability at discharge, presence adverse effects (AE). We compared both groups themselves. Comparison of averages t Student; comparison of proportions Chi2 test. $p<0.05$ statistical significance.

RESULTS. Admitted 378 patients. 146 women/270 men. Averages:age 65.11; stay:3.44 days; APACHE II 11.6. Mortality:14.2%. Disability:4.3%.121 patients presented AE;9 patients (2.38%) thought to claim (group "A"). If we divided the patients between adults and old patients (>70 years) patients of "A" group (complaints makers) are younger (77.7%), present more severity of illness (APACHE II 13.6 versus 11.5 in "B"),($p<0.01$). Patients died in "A" group had got APACHE lower than died in "B" (16.8 vs 21.6),($p<0.05$). "A" presents more AE than "B" (66.6 vs 28.25),($p<0.05$). More mortality in "A"(55.5 vs 13.26), ($p<0.05$), as well as the unfavorable evolution (66.6% vs 17.4%),($p<0.05$). At the moment at this work was writen only one of these complaints is a real demand.

CONCLUSION. 1. They are patients who present complaints about medical attention and have not presented AE./2. Small percentage of the complaints become judicial demands./3. Some times, despite of having medium APACHE, high percentaje present bad evolution. It is probable that unexpected outcomes, and other factors like the age, made patients and they families the medical assistance is a responsible for the situation./4. It should make more studies to know the reasons of patient's demands and to prevent its.

REFERENCE(S). 1. Studdert D M, Thomas E J, Brstin H R, Brett I W, Zbar B I W, Orav E J, Brennan T A. Negligent Care and behavior Malpractice claims in Utah and Colorado. Medical Care 2000;38:250-256. 2. Pronovost P, Wu AW, Dorman T, Morlock L. Building safety into ICU. Critical Journal of Care; 17(2)2002:78-85. 3. Localio A R, Lawthers A G, Brennan T A et al. Relation claims between malpractice and to adver events due to negligence. Results of the Medical Harvard Practice Study III N Engl J Med. 1991 Jul 25;325(4):245-51.

0115

STATISTICAL MODEL FOR ROUTINE BIOLOGICAL RESULTS OF ICU PATIENTS: A TOOL FOR QUALITY MANAGEMENT?

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INTRODUCTION. Daily examination of basic blood parameters like ionogram, blood sugar and hemogram is routinely performed in ICU patients. Recently, the impact on mortality of a strict blood sugar control was shown.

METHODS. We decided to study retrospectively the routine biological results of the ICU patients (between november 2004 and december 2005) for quality evaluation of the daily strategy used in our ICU for these conventional parameters and the impact of this management on the mortality in our ICU. Statistical analysis by logistic regression adjusted for clustering permited us to develop a mathematical model and was used to analyse the correlation of these biological parameters (influenced by our actual strategy) with the mortality in our ICU.

RESULTS. Biological results of 658 ICU patients were reviewed and logistic regression analysis was performed using 7351 blood samples. Consecutive blood results for Urea, Creatinine, Na, Cl, HCO3, Ca, pH, Mg, Glucose, Total Protein, Albumine and Hb were analysed and compared with the mortality in this ICU population (54/658 - 6.85%). Parameters like Creatinine, K, Cl, HCO3, Ca, Ph, Mg, Tot Prot, pH and Glucose were not significantly correlated with our mortality results; others like Na and Hb were correlated but not independenrly. Urea, albumine and ratio Urea/creatinine were independtly correlated with the mortality results in our population. The statistical analysis also permit to determin a predicting score for our ICU mortality: score = 0.01434074 uree - 1.17160065 albumine + 0.03026880 urea/creatinine - 1.574547791 with an area under the ROC curve of 0.8316.

TABLE 1.

Statistical results for significant independent blood parameters

	p	Odds ratio	95% Conf Interval
Urea	0.001	1.0097	1.003 - 1.015
Albumine	0.007	0.454451	0.256 - 0.805
Urea/creatinine	0.000	1.020584	1.010 - 1.030

CONCLUSION. This observational study suggests that a statistical follow up of routine biological results could be an interesting tool for quality evaluation of current ICU strategies. Further studies are necessary to determine if the mortality of critical patients could be influenced by this statistical follow up.

0117

CARDIAC OUTPUT MEASUREMENT USING THE FLOTRAC IN THE HEMODYNAMIC INSTABLE PATIENTS

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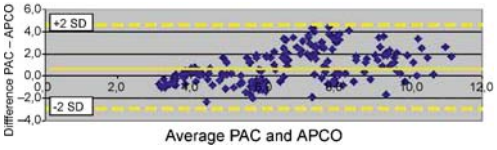
INTRODUCTION. One of the latest alternatives is Arterial Pressure based Cardiac Output (APCO) measuring. Edwards Lifesciences has introduced the FloTrac sensor which monitors cardiac output continuously using a conventional arterial line. The system does not require calibration but bases its calculations on arterial waveform characteristics together with patient's demographic data according to the method described by Langewouters. This new system claims the possibility to measure vascular resistance and compliance. Results about the validation of this new method were recently published by McGee and look very promising, especially in post cardiac surgery patients.

METHODS. Patients with hemodynamic instability who needed a Pulmonary Artery Catheter (PAC) to guide therapy were also connected to the Arterial Pressure based Cardiac Output (APCO) FloTracTM Edwards, Lifesciences, Irvine, CA, USA. Data collected from APCO was evaluated and compared with the intermitted cardiac output measurement using the PAC. Data is analysed using the Bland-Altman method.

RESULTS. In this study 11 patients are analysed. Mean age is 69 years [36 – 88]. Mean APACHE II score 23 [16-35]. Hemodynamic instability originated from severe sepsis / septic shock in 9 patients and two patients suffered from cardiogenic shock. One after cardiopulmonary resuscitation and one patient after myocardial infarction. A total of 193 cardiac output measurements have been obtained. Bland Altman plot gives a mean bias of 0.8 l/min, a standard deviation of 1.6 l / min and the limits of agreement -2.3 – 3.9 l/min.



CONCLUSION. The FloTrac measures cardiac output without the need for system calibration. FloTrac can be used in clinical practice but more research is needed to fully understand APCO and its implications.

Poster Sessions
Assessment, pitfalls and shortcomings of cardiac output 0116-0128

0116

INVASIVE AND LESS INVASIVE CARDIAC OUTPUT MONITOR IN INTENSIVE CARE

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INTRODUCTION. Several new less invasive continuous technologies have become available to monitor cardiac output (CO). It is unclear whether the less invasive devices provide a similar degree of accuracy to the more invasive pulmonary artery catheter (PAC).

METHODS. Patients undergoing PAC placement (Vigilance®, Edwards Lifesciences (CCO) for clinical reasons were also monitored with FloTrac™ (Edwards Lifesciences) and LiDCOplus™. PulseCO (LiDCO group) was calibrated at baseline using the Lithium dilution technique and then it was not recalibrated for the next 8 hours. Readings of FloTrac, PulseCO and CCO were taken hourly for 8 hours and compared against intermittent thermodilution the PAC performed in triplicate randomly throughout the respiratory cycle (ITD). Device measurements were compared using a Bland-Altman Plot.

RESULTS. 9 patients were enrolled. 76 total pairs of data were collected for all the devices. ITD CO range was high, (3 to 10 L/min) (mean 6.6 ± 1.8 L/min). Accuracy and precision (Bias ± 2SD) when compared against ITD were –0.62 ± 2.15 L/min for FloTrac, and L/min for PulseCO and 0.3 ± 1.85 L/min for CCO.

TABLE 1.

n of pairs 76, ITD mean 6.6 ± 1.8 L/min

	FloTrac	PulseCO	CCO
BIAS ± 2SD	–0.62 ± 2.15 L/min	0.1 ± 1.90 L/min	0.3 ± 1.85 L/min

CONCLUSION. All three technologies for the measurement of CO performed in a clinically acceptable range. The less invasive devices had slightly wider limits of agreement. These new tools allow the measurement of CO in settings not suitable for invasive tools.

0118

COMPARISON OF CARDIAC OUTPUT ESTIMATION BY INTERMITTENT LITHIUM DILUTION WITH PULSE POWER ANALYSIS

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INTRODUCTION. The purpose of this study was to examine the drift in cardiac output (CO) estimation between the uncalibrated continuous PulseCO™ CO estimation and the lithium dilution estimation of CO.

METHODS. Patients monitored with the LiDCO-Plus™ for therapeutic reasons were enrolled. The gold standard reference measurement for CO was the lithium dilution measurement from the LiDCO. The PulseCO was calibrated with LiDCO at baseline. Further measurements of CO were taken at 1, 2, 4, 8 and 24 hours from baseline with lithium dilution curves. PulseCO readings (not recalibrated) were recorded simultaneously at these timepoints. A percentage error of disagreement of less than 30% was taken as being clinically acceptable.

RESULTS. 14 patients were enrolled. At baseline patients showed a wide range of cardiac output (mean 8.01 l/min, SD 4.27 l/min). CO measured from the two devices correlated well (r2=0.82, p <0.01) The bias and limits of agreement were clinically acceptable (less than 30%) for the first 8 hours but then widened. Table 1. (LiCO = Lithium dilution CO, PCO = PulseCO CO).

TABLE 1.

	Mean LiCO (SD) l/min	PCO-LiCO bias ± 2SD l/min	95% Limits of ag l/min	% Error
Baseline	8.01 (4.27)			
1st hour	8.13 (3.99)	-0.28 ± 2.32	-2.6 to 2.04	28%
2nd hour	8.22 (3.72)	0.079 ± 1.85	-1.76 to 1.94	23%
4th hour	7.90 (4.28)	-0.05 ± 2.24	-2.19 to 2.29	28%
8th hour	6.48 (3.13)	0.18 ± 2.2	-2.04 to 2.4	33%
24th hour	8.66 (4.45)	-0.9 ± 7.56	-8.65 to 6.64	85%

CONCLUSION. The PulseCO™ derived CO provides a high level of accuracy with minimal drift over the first 8 hours However, after this time, there was consistently greater than 30% difference on the CO as estimated by the uncalibrated PulseCO™ compared with the lithium dilution estimate.
The PulseCO™ estimation of CO provides a reliable continuous estimation of CO over 8 hours over a wide range of cardiac output in an adult intensive care population. Patients who require CO estimation for longer periods or who have profound haemodynamic changes should have recalibration with the LiDCO™ every 8 hours.

0119

HAEMODYNAMIC MONITORING IN EUROPE: A POSTAL SURVEY

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INTRODUCTION. On behalf of the Cardiovascular Dynamics section, ESICM.
Objectives: To understand the differing practices of haemodynamic monitoring across Europe.

METHODS. A questionnaire was sent by email to members of the cardiovascular section of ESICM.

RESULTS. 200 questionnaires were sent to section members from 32 countries. 103 (51.5%) replies were received. All centres (100%) were able to monitor routine variables such as invasive arterial pressure (IAP) and central venous pressure (CVP). 98/103 (95.2%) have the ability to perform pulmonary artery catheterization, 86/103 have echocardiography readily available, 40/103 (40%) have Oesophageal Doppler monitors, 48/103 (47%) have PiCCO monitors and 19/103 (18%) have LiDCO monitors. Fluid responsiveness was reported as being assessed prior to a fluid challenge in 82/103 (80%). Variables used to assess fluid responsiveness were CVP 38/103 (37%), pulmonary artery occlusion pressure (PAOP) 14/103 (14%) and dynamic indexes such as systolic pressure variation (SPV), pulse pressure variation (PPV) and stroke volume variation (SVV) in 37/103 (36%) of centres (table 1). CVP was the most commonly used variable for the assessment of preload (36%). Other variables used for the assessment of preload included PAOP in 15/103 (14%) and volumetric measures: GEDV in 11/103 (11%), LVEDA in 5/103 (5%), EVLW in 4/103 (4%).
The individual choice of haemodynamic monitors was based on the degree of invasiveness in 24/103 (23%), the availability of more specialised variables 22/103 (21%), accuracy 6/103 (6%) as well as tradition, cost and availability.

TABLE 1.

CVP	SPV, PPV, SVV	PAOP	LVEDA	GEDV	OTHER	EVLW
37%	36%	14%	5%	5%	3%	1%

CONCLUSION. This survey has highlighted the market penetration of the new less invasive haemodynamic monitors. There remains some confusion as to the best variable for the assessment of preload and fluid responsive states.

0121

VALIDATION OF 3 DIFFERENT CONTINUOUS MINIMAL INVASIVE CARDIAC OUTPUT METHODS IN SEPTIC PATIENTS

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INTRODUCTION. Pulse contour analysis calibrated by transpulmonary thermodilution (PiCCOplus Pulsion Medical Systems, Munich, Germany) is an alternative to Swan-Ganz monitoring. Recently a new pulse contour analysis monitor, without the need for calibration became commercially available (FloTrac/Vigileo, Edwards Lifesciences, Irvine CA, USA). The aim of this study was to compare intermittent bolus thermodilution CO (TDCO) with continuous CO (CCO) obtained by 3 different methods: pulse contour analysis with FloTrac sensor (FCCO) and PiCCOplus system (PCCO) and CO obtained by indirect Fick principle with NiCO monitor (NCCO), Novametrix Medical Systems, Wallingford, USA

METHODS. Prospective study in 7 mechanically ventilated patients (5 male). Age 69.8±13.5, BMI 27.8±4.6, SAPS II 54.1±15, APACHE II 22.5±8.1, and SOFA score 7.7±3.7. Triplicate FCCO, PCCO and NCCO values were recorded within 5 min before and 5 min after TDCO was determined by 3 repeated injections of 20ml of sterile saline via a central venous line. Statistical analysis was done using Pearson correlation and Bland-Altman analysis.

RESULTS. 33 tripled data sets were obtained. TDCO values recorded during the study period ranged from 3.7 to 11.9 L/min. The Pearson correlation coefficient comparing TDCO with various CCO techniques was best for PCCO (R2= 0.79) vs FCCO (R2=0.5) vs NCCO (R2=0.57). Correlation between FCCO and NCCO showed a R2= 0.72. Bland and Altman analysis comparing TDCO with CCO revealed a mean bias ± 2SD (limits of agreement) of -0.17 ± 2 L/min (PCCO), vs -0.6±3.2 L/min (FCCO) and -0.14±3.2 (NCCO). Bland and Altman analysis comparing FCCO with NCCO showed a mean bias ± 2SD (limits of agreement) of -0.3 ± 2.6 L/min.

CONCLUSION. These preliminary results indicate that CCO in critically ill septic patients that are mechanically ventilated can be most reliably monitored by the PiCCOplus system. The limits of agreement were unacceptably high for all other comparisons. The NiCO device and the FloTrac pulse contour analysis device were unable to keep track of changing TDCO during unstable haemodynamic conditions. The FloTrac system showed a tendency to overestimate rapid changes in CO, preload or afterload when compared to the PiCCOplus system.

0122

RELATION BETWEEN THE TRICUSPID ANNULUS PLANE SYSTOLIC EXCURSION AND HEART FUNCTION IN ICU PATIENTS

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INTRODUCTION. The tricuspid annulus plane systolic excursion (TAPSE) is related to right ventricular ejection fraction in patients with heart diseases. Our aim was to investigate the link between TAPSE and cardiac function in ICU patients.

METHODS. This prospective study included 76 patients (38F/38M) who underwent Doppler echocardiography with measurements of TAPSE. Right and left heart function was quantified by the ratio of right to left ventricular end-diastolic area (RVEDA/LVEDA) and the left ventricular ejection fraction (LVEF). Tricuspid annular velocities were determined by Doppler tissue imaging (DTI). In 27 patients with invasive hemodynamic monitoring the examination was repeated after passive leg raising or after treatment (e.g., fluid challenge, dobutamine infusion).

RESULTS. At baseline, TAPSE (mean (SD) =20 (5) mm) was related to LVEF (48 (12) %, R=0.49), age (59 (17) yrs; R= - 0.42), RVEDA/LVEDA (0.55 (0.16); R= - 0.25) and to numerous echocardiographic variables. There was no relationship between TAPSE and gender, weight, height, arterial pressure and heart rate. The combined influences of LVEF and age explained 30% of TAPSE variability (multiple R2=0.30; p<0.01), with no additive value of the diastolic ventricular ratio or other variables. Following hemodynamic maneuvers, changes in TAPSE (from – 6% to + 60%) and in LVEF (-16 to + 111%) were linearly related (R2=0.75; p<0.001). The relationship between heart function and DTI velocities was weak or not significant.

CONCLUSION. In our study population, TAPSE was more related to LVEF than to RVEDA/LVEDA (which is however a rough measure of RV function). This could be explained by the contribution of the LV to RV function via the *crista supraventricularis* kinetics. Further studies are needed to confirm the interest of TAPSE to monitor cardiac function in the ICU.

0123

USEFULNESS OF B-TYPE NATRIURETIC PEPTIDE FOR WEANING – INDUCED PULMONARY EDEMA DIAGNOSIS

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INTRODUCTION. Pulmonary edema (PE) is a classical cause of acute respiratory failure during weaning from mechanical ventilation. As the treatment should be different its recognition is an important issue. Only invasive method such as pulmonary artery catheterization can distinguish between PE and other causes of weaning failure demonstrating an increase in PAOP > 18 mmHg. The B-type natriuretic petide (BNP) is an established marker of wall ventricular stress. We prospectively investigated whether the plasmatic BNP level and its change during a weaning test could reliably detect a weaning-induced PE.

METHODS. In 13 patients who failed at two consecutive weaning tests on a T-tube, a pulmonary artery catheter was inserted. In all patients, a subsequent weaning trial over a maximum 1-h period of SB using a T-piece was performed. Weaning-induced PE was diagnosed if intolerance to spontaneous breathing occurred while PAOP increased above 18 mmHg. Twenty-two weaning trials were analyzed and BNP was measured before and at the end of the weaning period.

RESULTS. Overall BNP (44 simultaneous measurements) weakly correlated with PAOP (r^2= 0.30, $p < 0.05$). From the baseline to the end of the weaning period, PAOP increased from 12 ± 7 mmHg to 21 ± 10 mmHg ($p<0.05$). In case of weaning-induced PE (n=12), PAOP increased from 15 ± 8 mmHg to 28 ± 9 mmHg ($p< 0.05$). In absence of PE, PAOP increased from 10 ± 4 mmHg to 13 ± 3 mmHg ($p< 0.05$). Weaning-change in BNP (delta-BNP) was significantly higher in the PE group (41 ± 22% vs 12 ± 21%, $p< 0.05$). The best threshold value of BNP measured before the weaning trial to predict PE occurrence, was 460 pg/ml with sensitivity (Se) of 67%, specificity (Spe) of 80%, positive predictive value (PPV) of 80% and negative predictive value (NPV) of 67%. The best threshold value of BNP measured at the end of the weaning period to predict PE occurrence, was 480 pg/ml with Se of 75%, Spe of 80%, PPV of 82% and NPV of 72%. The predictive value of BNP measured after was significantly better (area under the ROC curves) than that measured before the trial.

CONCLUSION. Although BNP may provide some degree of prediction of weaning-induced PE, our preliminary results suggest that predictive values are not satisfactory enough for BNP to be used as a single marker of a weaning-induced PE.

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0124

ARTERIAL PULSE CONTOUR SYSTEM (FLOTRAC-TM) FOR MEASUREMENT OF CARDIAC OUTPUT

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INTRODUCTION. Non-invasive assessment of continuous cardiac output (CO) may be performed by analysis of the arterial pulse contour (APCO) without in vivo calibration (Vigileo System, FloTrac™; Edwards Lifesciences, Irvine, CA, USA). The aim of the study was to assess the level of agreement between a continuous APCO and CO obtained with a pulmonary artery catheter in critically ill patients.

METHODS. We prospectively studied all consecutive patients admitted to ICU in a two-month period in whom a pulmonary artery catheter (Edwards Lifesciences) was placed for hemodynamic monitoring, by measuring simultaneously APCO with a FlotracTM-Vigileo System. CO determinations were performed each hour since pulmonary artery catheter was placed. Thermodilution CO (TCO) measurements with pulmonary artery catheter could be either continuous or intermittent. Statistical analysis was performed using Pearson's correlation test, t test and the method described by Bland–Altman. Statistical significance was considered $P < 0.05$.

RESULTS. A total of 10 patients were included, with 303 matched CO determinations. Causes of admission were septic shock (SS) (n=5) and elective postoperative cardiac surgery (PC) (n=5). Data at admission (mean, range) were: age 63 (47-87) years (SS: 60, PC: 67), body weight 74 (52-110) kg (SS: 71.2, PC: 78.5), APACHE II 15 (7-23) (SS: 18, PC: 11) and SOFA 9 (5-13) (SS: 12, PC: 6). CO at admission was: APCO 6.0 (3.8-9.6) L/min and TCO 8.4 (4.9-16). Overall difference between APCO and TCO measurements (bias ± 2SD) was -2.1 ± 4.2 L/min. However, CO determinations disagreements in SS were greater than PC (bias ± 2SD: -2.0 ± 3.6 versus -0.15 ± 1.78 L/min, respectively, P = 0.001) for PC and -2.3 ± 3.8 L/min for SS). In fact, the bias between the two CO methods correlated to TCO ($r = 0.91$, $p < 0.001$). Finally, SS patients with TCO =< 7 L/min showed highly comparable APCO values (bias ± 2SD: -0.53 ± 2.0 L/min) whereas when TCO was >7 L/min APCO understimate TCO (bias ± 2SD: -4.3 ± 2.1 L/min).

CONCLUSION. FloTrac™ system seems to be reliable for monitoring CO in the normal range in critically ill patients, but may underestimate CO in septic hyperdymanic patients. Larger population studies as well as subgroup analysis are needed to confirm these preliminary data.

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0125

ACUTE CHANGES IN BLOOD PRESSURE DO NOT ALTER THE RELIABILITY OF PULSE-CONTOUR CARDIAC OUTPUT

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INTRODUCTION. Using the PiCCO™ device, cardiac output can be measured either by transpulmonary thermodilution or by pulse-contour method. The algorithm for continuous cardiac output determination by pulse contour-analysis has been shown to be reliable such that recalibration every 6-8 hours is considered enough. However, in the case of acute changes in vascular tone, the reliability of this algorithm may be still questionable. The aim of our study was to examine whether cardiac index measured by pulse-contour method agrees with cardiac index measured by transpulmonary thermodilution in the case of marked changes in mean arterial pressure (MAP).

METHODS. patients equipped with a PiCCO™ device (Pulsion, Germany) for monitoring of circulatory failure. The pulse-contour system was initially calibrated by triplicate arterial thermodilution and no further recalibration was performed over the following 6 hours (deactivation of automatic calibration). Each time the attending physician decided to perform thermodilution measurements, the pulse-contour cardiac index value was also recorded.

RESULTS. A total of 284 pairs of measurements of cardiac index were obtained in 31 patients. The pulse-contour cardiac index correlated with the thermodilution cardiac index (r2 = 0.68). The Bland-Altman analysis showed a bias of 0.09 and a standard deviation of 0.60 L/min/m2. Ninety six times in 28 patients (mean age: 62 ± 10 yrs), changes of MAP more than 15% were observed between baseline and one of any time of measurements. At baseline, their MAP was 87 ± 19 mmHg, their cardiac index was 3.7 ± 1.1 L/min/m2. Their mean change in MAP was 28 ± 17% and in thermodilution cardiac index was 15 ± 14%. Most of these patients suffered from severe sepsis (n=19) and 16 received norepinephrine at baseline. The pulse-contour cardiac index correlated with the thermodilution cardiac index (r2 = 0.75). The Bland-Altman analysis measurements showed a bias of 0.04 L/min/m2 and a standard deviation of 0.58 L/min/m2. In 31 patients, changes of MAP lower than 15% were observed 188 times between baseline and one of any time of measurements. The pulse-contour cardiac index correlated with the thermodilution cardiac index (r2 = 0.68). The Bland-Altman analysis showed a bias of 0.15 L/min/m2 and a standard deviation of 0.61 L/min/m2.

CONCLUSION. Our study showed that: 1) over a 6-h period cardiac index measured by pulse-contour method agreed with cardiac index measured by transpulmonary thermodilution and 2) acute changes in arterial pressure did not alter this agreement.

0126

COMPARISON OF INDICATOR DILUTION VS AN ARTERIAL PRESSURE WAVEFORM CARDIAC OUTPUT (APCO) ALGORITHM

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INTRODUCTION. An arterial waveform algorithm which estimates Cardiac Output (CO) from an adapted arterial pressure transducer and a waveform analysis algorithm (Vigileo/FlowTrac, Edwards Lifescience) was compared at timed intervals over 6 hours to a validated indicator dilution (ID) method for CO measurement (1). APCO uses a pressure based algorithm and estimates stroke volume from entered patient biometrics and statistical data derived from the the arterial pressure waveform. The algorithm uses no external calibration, as the literature indicates an inbuilt compensation to allow for aortic compliance and changes in arterial tone.

METHODS. Any ICU patient with a LiDCOplus in clinical use was eligible for this study. Patients were excluded if there were contraindications either to lithium dilution, or if the boundary conditions for ID were not met. APCO was set up and allowed to stabilise over 10-15 minutes. LiDCO measurements were made at the outset and at timed intervals for 6 hours with the ID and APCO results recorded simultaneously.

RESULTS. 10 ICU patients with a variety of diagnoses were studied. (sepsis n=3, trauma n=3, cardiac arrest n=2, respiratory failure n=2 -5 males 5 females - age range 19-74 years). Mean APCO was 5.8 l/min (2.7 - 15.8 l/min) vs. mean ID 6.5 l/min (2.9 - 15.2). $R^2 = 0.46$ with a bias of 0.63 and precision +/- 4.2 l/min. There was an 81% error of agreement between the two methods.

CONCLUSION. The data showed a poor correlation between ID and APCO. The bias changed with increasing CO and had wide limits of agreement against an ID standard. Comparison with ID indicated an accuracy outside generally accepted limits of precision (+/- 30%) for interchangeability of the measurement techniques (2).
It is recognised in this comparison that the numbers of patients are small limiting the degrees of freedom for the analysis which may result in widened limits of agreement. The data is worrying however and further patients are being studied.

REFERENCE(S). 1) Linton R, Band D, O'Brien T, Jonas M Leach R. Crit Care Med; 25: 1796-1800 1997.
2) Critchley A. Critchley J. J. Clinical Monitoring and Computing 15:85-91 1999.

0127

EVALUATION OF CARDIOPULMONARY FUNCTION WITH TEI INDEX DURING INDUCTED ARDS IN NEWBORN PIGLETS

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INTRODUCTION. Acute respiratory distress syndrome (ARDS) is associated with a diffuse pulmonary inflammatory reaction with increase of pulmonary resistances. A new Doppler echocardiographic index combining systolic and diastolic time intervals (Tei Index) seems to be useful in the evaluation of right ventricular function during normal conditions and primary pulmonary hypertension (1).

METHODS. Sixteen mixed-strain newborn piglets (age 30-40 days and body weight 6-8 Kg) were anesthetized with ketamine (2.5 mg/Kg i.m) and propofol (bolus of 5-7.5 mg/Kg ev and continuous infusion of 7 mg/Kg/hr). The piglets were intubated with an endotracheal tube (4-5 mm internal diameter) and mechanically ventilated. A 4 F angiography catheter was inserted via the right jugular external vein and placed in the main pulmonary artery to measure pulmonary arterial pressure (PAP). ARDS was inducted by endotracheal administration of saline solution (100 ml). Diagnosis of ARDS was established when PaO2/FiO2 ratio was < 200. Complete two-dimensional Doppler echocardiographic examination was performed before induction of ALI (T0), and 10 (T1), 60 (T2) and 120 min after (T3). Sampled for blood gas analysis were withdrawn at same times. Data are expressed as mean±SD. Variables were compared using unpaired Student t-test.

RESULTS. Study results are summarized in Table 1.

TABLE 1.

	Basal	10’	60’	120’
PaO2/FiO2	365±124*	59±24*	119±91*	134±84
PAP(mmHg)	17±4*	30.2±6.4*	29±5*	25±3.5
Tei-index	0.38±0.14*	0.78±0.32*	1.23±0.1*	0.63±0.29

** p<0.01*

CONCLUSION. RV-Tei index increases during hypoxic condition and decreases with improvement of pulmonary function in a newborn piglet model. Tei Index seems to be a non-invasive quantitative parameter for assessing cardiopulmonary function in newborn piglets with ARDS.

REFERENCE(S). 1. Tei C, Dujantin KS, et al. J Am Soc Echocardiogr 1996; 9:838-847.

0128

IS OPTIMISATION OF SVO2 A WORTHWHILE GOAL IN DUTCH ICU PATIENTS?

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INTRODUCTION. Management of the critically ill patient includes hemodynamic optimisation. According to Rivers et al. (1, 2) this demands early goal directed therapy (EGDT), including SvO2 monitoring. The objective of our study is to compare our ICU population with the population described by Rivers (1).

METHODS. A total of 71 patients in 3 intensive care units were included. All patients arrived at the intensive care units either directly from the Emergency Department or after acute surgery with severe sepsis or septic shock. Other hospitalised patients and patients after elective surgery were excluded. To determine SvO2, central venous or mixed venous oxygen saturation were measured as early as possible after insertion of a central venous catheter or pulmonary artery catheter. Hematocrit and lactate were determined from the first obtained arterial bloodsample.

RESULTS. At admission 48 patients (68%) showed a SvO2 > 70%. Fourteen (14) patients (19%) had a SvO2 of 60-70%, 9 patients (13%) showed a SvO2 < 60% while only 2 of these were below 50%. Our population showed a significant higher SvO2 (73.1% ± 10.6 vs. 48.9% ± 12.3) and lower lactate (3.1 mmol/l ± 2.9 vs. 7.3 mmol ± 4.6) and hematocrit (29.0% ± 5.8 vs. 34.7% ± 8.5) compared to River’s population.

CONCLUSION. There is a significant difference in condition of the patients at admission between our ICU’s and the ED where the EGDT paper originates. Therefore it is questionable whether optimisation of SvO2 is a useful goal in our patients.

REFERENCE(S). 1. Rivers E, Nguyen B, Havstad S, Ressler J, Muzzin A, Knoblich B, Peterson E, Tomlanovich M. Early goal-directed therapy in the treatment of severe sepsis and septic shock. N Engl J Med 2001;345:1368-1377 2. Rivers E, Ander DS, Powell D. Central venous oxygen saturation monitoring in the critically ill patient. Curr Opin Crit Care 2001;7:204-211.

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0129

THE EFFECT OF A STRUCTURED PHYSIOTHERAPY LED REHAB PROGRAMME ON PATIENTS FOLLOWING ICU DISCHARGE

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INTRODUCTION. The severe physical and psychological effects of critical illness may take years to recover. A RCT using self directed rehabilitation manuals demonstrated improvement in physical recovery (1). The aim of this study was to evaluate the effectiveness of a therapist led, structured rehabilitation programme for patients following discharge from critical care.

METHODS. We recruited 8 ICU survivors admitted for >48h and discharged home to this prospective, before and after intervention study. Physical status was assessed using the 6 minute walk test (6MWT)(2) and the incremental shuttle walk test (ISWT) (3) prior to and following a six week course of cardiopulmonary exercise. We completed an assessment of hospital anxiety and depression at the start and end of the programme. Data were analysed using Wilcoxon Signed Ranks Test.

RESULTS. All patients who attended the post ICU rehabilitation programme showed a significant improvement in both walking tests and Depression score (see table). A median increase of 107.5m (31%) was seen for the six minute walk test and an increase of 80m (29.5%) for the incremental shuttle walk test. 6/8 subjects also demonstrated a decrease in both anxiety and depression scores on the HADS scale, 4 of which moved out of significant to normal levels.

TABLE 1.

Distances walked in metres and HAD scores Median (Interquartile range)

	6MWT m	ISWT m	Depression	Anxiety
Before	347.5 (196-464)	270 (80-410)	7 (3.5-9.75)	5 (3.25-8)
After	455 (291-540)	350 (170-550)	4 (1.25-6.75)	5 (2.5-6.75)
P	0.012	0.018	0.017	0.139

CONCLUSION. We have shown a 6 week physiotherapy led rehab programme is associated with improved physical and psychological function following critical illness.

REFERENCE(S). 1. Jones C et al Crit Care Med 2003;31:2456-2461.
2. Lipkin D P, Scriven A J, Crake T, Poole-Wilson P A. Six minute walking test for assessing exercise capacity in chronic heart failure. Br Med J. 1986;292:653–655.
3. Singh S J, Morgan M D L, Scott S, et al. Development of a shuttle walking test of disability in patients with chronic airways obstruction. Thorax 1992;47:1019-1024.

0130

WIDESPREAD RESTRICTIONS IN DAILY FUNCTIONING AFTER DISCHARGE FROM THE INTENSIVE CARE UNIT

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INTRODUCTION. Survivors from intensive care (ICU) have a reduced quality of life (QOL) after hospital discharge. Planning optimal rehabilitation follow-up care requires a thorough evaluation of functioning after discharge from the ICU. The purpose of this study was to describe restrictions in daily functioning at discharge from the ICU and after 3 months.

METHODS. In a consecutive series of ICU patients who were ventilated >48 hours, functional status was assessed within one week after ICU discharge with the Barthel Index (BI) and after 3 months with the Sickness Impact Profile 68 (SIP68) and BI. Patients were invited to a follow-up service 3 months after ICU discharge to evaluate functional status and to discuss perceived problems.

RESULTS. Of 56 patients assessed after ICU discharge, 4 died and 23 refused follow-up at 3 months. Consequently 29 patients were assessed after 3 months of whom 18 visited the follow-up service. Patients attending the follow-up service had better initial health status at ICU discharge (BI) than those not attending. One week after ICU discharge the majority of the patients had severe restrictions in performing basic daily activities (76% severe, 15% moderate and 9% slight dependency (BI)). After 3 months hardly any restrictions in basic daily activities were found, however in all patients, daily functioning was impaired (Median domain scores of the SIP68, range 0 to 100 with higher scores indicating poorer functioning: ‘somatic autonomy’ 0, ‘mobility control’ 42, ‘social behavior’ 50, ‘mobility range’ 30, ‘emotional stability’ 17, ‘psychological autonomy and communication’ 9). The majority of the patients reported problems related to dependency in daily activities, mobility, muscle weakness, memory and concentration, emotional instability, loss of taste and weight loss. None had returned to their job.

CONCLUSION. At discharge from the ICU, patients were dependent for basic ADL activities and three months later, daily functioning was still restricted. Considering that the follow-up service was attended only by a selection of the ICU population with a relative good health status, we conclude that it is urgent to carefully plan rehabilitation follow-up, in all patients with a prolonged ICU stay. Rehabilitation treatment should at least include support with respect to physical, psychological, and social functioning, and nutritional problems.

0131

TESTING FOR AEROBIC CAPACITY BEFORE AND AFTER BARIATRIC SURGERY

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INTRODUCTION. The 6-min walk test (6'WT) and the treadmill ergometric test are simple and validated measurements of functional capacity that predict survival in patients with severe obesity and also cardiovascular diseases. This study aimed to compare these procedures in obese patients undergoing bariatric surgery.

METHODS. Population (32 morbidly obese patients, 93.8% female, age 40.9+/-9.6 years, body mass index 51.3 -/+ 8.4 kg/m2) was analysed preoperative and 10-12 months after bariatric surgery (gastric bypasss). In the 6'WT patients were instructed to walk from end-to-end of a previously measured corridor, covering as much distance as possible in the allotted period of 6 min. They were allowed to stop and rest if desired, resuming walking as soon as they felt able to do so. In the fatigue rather than time-limited treadmill exercise (modified Bruce test) total distance, Borg scale of perceived exhaustion, and physical as well as cardiovascular variables were recorded.

RESULTS. All patients performed the required exercise without troubles. Preoperative and postoperative findings for treadmill protocol were: distance 401.8-/+ 139.1 vs 690.5 /+76.2 m and time 5.4+/-1.4 and 8.8+/-1.0 min ($p<0.0001$). Corresponding distance for 6'WT were 670.2+/-80.1 vs 820.3+/-92.4 m ($p<0.0001$).

CONCLUSION. 1) The 6'WT reproduced the general pattern of the treadmill test with similar differences, and both were successfully completed; 2) The 6'WT was safe, inexpensive and could be conducted without specialized equipment; 3) This test is recommended for functional assessment of patients with severe obesity.

REFERENCE(S). Faintuch J et al. Pulmonary function and aerobic capacity in asymptomatic bariatric candidates with very severe morbid obesity. Clinics 2004;59:181-6; Salvadori A et al. Work capacity and cardiopulmonary adaptation of the obese subject during exercice testing. Chest 1992;101:674-9; Ohrström M et al. Energy expenditure during treadmill walking before and after vertical banded gastroplasty: a one-year follow-up study in 11 obese women. Eur J Surg 2001;167:845-50; Hulens M et al. Predictors of 6-minute walk test results in lean, obese and morbidly obese women. Scand J Med Sci Sports 2003;13:98-105.

0132

MEASUREMENT OF CARDIOPULMONARY RECOVERY AFTER BARIATRIC INTERVENTION

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INTRODUCTION. Maximal oxygen consumption (VO2 max) is a valuable diagnostic and prognostic tool in obesity and cardiocirculatory diseases but studies with morbidly obese populations are uncommon. In a prospective protocol VO2max was investigated, aiming to define the effect of major weight loss on physiological response.

METHODS. Participants were obese women (n = 65, age 40.4 $\pm$ 8.4 years; body mass index/BMI 49.4 $\pm$ 5.4 kg/m2) candidates for anti-obesity gastric bypass. VO2max was estimated by measuring the heart rate response to reference levels of submaximal work on a computerized treadmill (modified Bruce protocol). Preoperative ergometric test was compared to early (4-6 months) and late (10-12 months) post-operatory follow-up. Patients were clinically stable and free from acute disease.

RESULTS. Tolerance to the test was adequate and no complications occurred. BMI diminished from 49.4 $\pm$ 5.4 to 36.8 $\pm$ 3.7 and 30.4 $\pm$ 4.4 kg/m2 in the three observations, respectively ($p<0.05$). VO2max increased in the same proportion: 25.4 -/+ 9.3, 29.8-/+ 8.1 and 36.7-/+ 8.3 ml/ min. Progressive normalization ($p<0.05$) could be shown for the two postoperative periods in comparison with pre-surgical findings, which were substandard, despite the fact that no physical rehabilitation program was employed in this series.

CONCLUSION. 1) VO2max significantly benefitted from weight reduction, in parallel with greater exercise tolerance on the ergometric test; 2) Preoperative cardiorespiratory performance was inadequate and substantially recovered in the late postoperative period; 3) The ergometric test was safe and can be recommended for non-critical morbidly obese subjects;

REFERENCE(S). Serés L et al. Cardiopulmonary function and exercise capacity in patients with morbid obesity. Rev Esp Cardiol 2003; 56:594-600; Faintuch J et al. Pulmonary function and aerobic capacity in asymptomatic bariatric candidates with very severe morbid obesity. Clinics 2004; 59:181-6; Salvadori A et al. Work capacity and cardiopulmonary adaptation of the obese subject during exercice testing. Chest 1992; 101:674-9; Ohrström M et al. Energy expenditure during treadmill walking before and after vertical banded gastroplasty: a one-year follow-up study in 11 obese women. Eur J Surg 2001;167: 845-50.

0133

CHALLENGES IN INTERPROFESSIONAL EDUCATION

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INTRODUCTION. Interprofessional Education (IPE) aims to enhance motivation with others by securing a common knowledge base and resolve misunderstandings. IPE aims to overcome prejudices and negative stereotyping and acquires collaborative competences. IPE facilitates positive interaction that, through a chain of events, should ultimately improve patient care [1]. Adult learning theory and evidence from successful interprofessional education is used to support interventions to enhance successful working and overcome barriers. This paper aims to identify the challenges with IPE and to discuss them in relation to the implementation of the MSc in Critical Care at Cardiff University.

METHODS. An extensive review of the literature was undertaken and comparisons were made to the MSc in Critical Care at Cardiff University.

RESULTS. There are obstacles to IPE such as attitudes, educational, financial and organisational obstacles but, at Cardiff University, we have embraced the challenges of IPE to ensure that critically ill patients are managed through interprofessional initiatives that are based on specialist knowledge, rigorous research and advanced understanding of the concepts involved in their care. This is delivered through the MSc in Critical Care, a distance learning, international, interprofessional course which, at the time of its inception, was unique and, as recognised by Parsell et al (1998), it encourages self directed, critical thinking, life long learners who are able to function as a team memeber [2].

CONCLUSION. At Cardiff University we strive to address the challenges presented by interprofessional education and the students of our MSc evaluate positively the opportunity to learn alongside and from other professionals and other disciplines. We will continue to address the challenges and develop our interprofessional MSc in Critical Care to facilitate improvements patient care.

REFERENCE(S). 1. Barr H, Hammick M, Koppel I, Reeves S. British Educational Research Journal, Vol. 25, No. 4, Post-Compulsory Education (Sep., 1999), pp. 533-544.
2. Parsell G, Spalding R, Bligh J. Shared Goals, shared learning; evaluation of a multiprofessional course for undergraduate students. Med Edu. (1998)32: 304-311.

0134

COULD A TRIAGE COURSE IMPROVE THE CAPABILITY TO CATEGORIZE CORRECTLY EMERGENCY PATIENTS?

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INTRODUCTION. We evaluated if a triage course improve the capability of the triage nurse to categorize correctly patients and its impact on the waiting time for physician examination.

METHODS. This is an observational study of 360 consecutive patients admitted from Jan.to Dec2005. All medical records were examined by 4 nurses and reviewed by 2 physicians. We excluded patients with life-threatening conditions. We collected:nurse triage category, time of initial evaluation by a triage nurse and by a physician, physicians diagnosis, demographic and clinical characteristics. Quality indicators of triage efficiency were:the urgency category agreement among nurses and investigators; documentation of triage form (presenting problem, history and vital signs, initial triage category and assessment area allocated); compatibility of triage nurses urgency category and the waiting time to physician examination. We compared the previous quality indicators before and after a 2 weeks course on triage. All the triage nurses attended the course. The triage urgency category (UC) were: urgency 1=immediate response; urg. 2 assessment within 20 min; urg.3 within 60 min; urg.4 within 120 min. T or chi square test were used to compare 2 groups.

RESULTS. 180 patients were included in the before-course (period 1) and 180 in the after-course (period2) group, mean age 48.7 and 56 yrs($p=0.007$). The 2 groups had similar demographic and clinical characteristics ($p>0.05$). In the after-coruse group there were more patients in urg.cat.(UC)3(68.3% vs 61.1%; $p>0.05$). After the course there were more cases of full agreement among the UC assigned by nurses and investigators (81.7%vs 76.7%; $p>0.05$) but there were fewer triage forms with a complete documentation:98.3%vs 98.8%; $p>0.05$. In period 1, we found that 70% of patients in UC 2 were examined by a physician within 20 min., instead in period 2 all patients (100%) in UC2 were examined by a physician within 20 min.($p<0.01$). Almost all (98%) the patients in categories 1,3,4 were examined within the expected time, in both periods. There was significant difference between the average waiting time for physician examination in UC2 before and after the course:33.2 min vs18.5min ($p<0.05$).

CONCLUSION. Our triage course seems to improve the capability of the triage nurse to categorize correctly emergency patients but it isn't able to improve the documentation quality indicators. Moreover the course had a strong impact on the waiting time for physician examination mainly in category 2 patients. Study limitations are:few patients and statistical power of results.

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0135

WHICH FACTORS ARE ASSOCIATED TO MISTRIAGE IN EMERGENCY PATIENTS?

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INTRODUCTION. We compared a group of patients with right triage to one with mistriage to study the causes of mistriage and their impact on the waiting time for physician examination.

METHODS. This is an observ. retrosp. study of 414 pat. admitted to our ED from Dec.2005 to Jan 2006. All records were examined by 4 nurses and reviewed by 2 physicians (ph). We excluded pat. with life-threatening conditions and collected:nurse triage category, time of initial evaluation by a triage nurse and by a ph., physician's diagnosis, demographic and clinical characteristics, the means of transport used, duty time, nurse experience in triage, ED crowding. We considered mistriage a triage with disagreement on the urgency category (UC) among examined nurses and investigators or with incomplete documentation: presenting problem, history, vital signs, initial triage category, assessment area allocated, retriage category. The triage UC were:urgency 1=immediate response; urg.2,3,4 assessment within 20,60,120 min. T or chi square test were used to compare 2 groups. We calculated the odds ratio (OR) and the logistic regression coefficient (r).

RESULTS. 307 pat. were included in the right triage group and 107 in the mistriage group, mean age 55.8 and 53.3 yrs (p=0.5). In the mistriage group 64% of pat. had an incomplete documentation and 36% had an under-triage. In the under triage group 10% of pat.in UC4 were assigned by investigators in UC3; 82% in UC3 were assigned in UC2; 8% in UC2 were assigned in UC1. In the mistriage group there were more women (57% vs 42.3%; p=0.03), more UC3 (72% vs 62%; p<0.05), more foreigners (22.4% vs 8%, p<0.05), more self admitted pat.(81.3% vs 58.6% p<0.01). Women (OR=1.8; r=0.31), foreigners (OR=3.26; r=0.39), self admitted patients (OR=3.07; r=0.35) were at risk of mistriage. In the under-triage group few patients (22%) in UC3 (right UC2) were examined by a physician within 20 min.(expected time for right UC). Moreover in this group the average waiting for physician examination in UC3 (right UC2) and in UC2 (right UC1) was longer than expected time for real UC:73.7min. vs 13.7 min.

CONCLUSION. Women, foreigners, self admitted pat. or with triage UC3 are at risk of mistriage. Nurse experience in triage, duty time and ED crowding don't seem to influence the performance of triage. Incomplete documentation is the main cause of mistriage. The under-triage has a very bad impact on the waiting time for physician examination.

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0136

RECRUITMENT AND RETENTION OF CRITICAL CARE NURSES – A SURVEY

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INTRODUCTION. The United Kingdom's Department of Health (DOH) recognises that the shortage of human resources within the National Health Service (NHS) is its biggest constraint [1]. There is still little evidence to support and inform managers in the recruitment and retention of critical care nurses. The aim of this paper is to critically analyse and evaluate factors which influence the recruitment and retention of critical care nurses.

METHODS. The literature was reviewed to identify current recruitment and retention strategies. This formed the foundation for the questionnaire used to perform the primary research. 176 qualified and non-qualified nurses across 2 sites were surveyed. Questionnaires were returned in sealed, unidentifiable envelopes and analysed by a computerised program. A combination of quantitative and qualitative methods of analysing the data collected was used. The recruitment and retention strategy of the directorate was identified and compared with the literature review and the evidence from the primary research.

RESULTS. A response rate of 69% (n=122) was achieved. The study found that factors considered to be important for recruiting staff were not necessarily the same factors needed to retain staff. For example, whilst education was identified by 66% of respondents (n=81) as an attracting factor when they joined the critical care unit, just 44% (n=54) said that it was an essential to them at the time of the study. 74% (n=90) of the nurses stated that communication and job satisfaction were essential criteria for retention. These were not identified as attracting factors. Although equitable pay was said to be essential in retention by 72 nurses (59%), only 4 nurses identified it as a top priority, and it is interesting to note that 18% of nurses (n=22) identified the enhanced overtime rates of the unit as an factor that attracted them to the unit. Promotional opportunities were only considered essential by 29 nurses, but again it is interesting to note that 46% of respondents had received a promotion during this employment. 46% of nurses had admitting to seeking alternative employment within the previous six months.

CONCLUSION. This directorate complies with the findings of the literature in the recruitment of staff by offering incentives such as educational opportunities, enhanced overtime rates and self-rostering, which are major attracting factors. However, these do not guarantee the retention of staff. The staff identified issues such as communication, support and job satisfaction to be the most important factors. These are not highlighted in the directorate's recruitment and retention strategy and is recommended. Further research in the field of rention is recommended.

REFERENCE(S). 1. Department of Health. (2004). The Recruitment and Retention of Staff in Critical Care. London: HMSO.

0137

AN OBSERVATIONAL STUDY OF PREPARATION AND ADMINISTRATION OF INTRAVENOUS DRUGS IN 8 UK ICU'S

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INTRODUCTION. Critical Care Units prepare and administer tens of thousands of Intravenous Medications to patients every year. This process can pose serious risks to patients if the correct protocols are not observed, resulting in potential harm, and also increased organisational resource 1). Recognition of these risks has encouraged the UK Department of Health to identify I. V. Medication errors as an area that requires action to reduce patient harm (2).
The Study was conducted across 8 Critical Care units in the Greater Manchester Critical Care Network.

METHODS. A structured observational technique was used to assess the preparation and administration of IV drugs (3). Observers were recruited and trained to help with the study. Practice was audited against the NHS Scotland Clinical resource and audit group's 'Good practice statement (4).

RESULTS. A total of 1288 preparation and administration episodes of IV drugs were observed. With respect to drug preparation areas where practice fell below the audit standards included aseptic technique and checking drugs and patients with colleagues. With respect to drug administration areas where practice could be improved included problems with aseptic technique, and administering drugs that had been prepared by the previous shift.

CONCLUSION. In summary, a number of problems with the preparation and administration of drugs at the patients' bedside in critical care units have been identified. Work is now underway to disseminate information, standardise polices and provide competency based education to improve practice.

REFERENCE(S). 1 Ferner R.E. Whittington R.M. coroners' cases of death due to errors in prescribing or giving medicines or to adverse drug reactions- Birmingham 1986-1991. Journal of the Royal Society of Medicine.1994; 87; 145-148.
2 Department of health. Building a safer NHS for patients. Improving safe medication practice. UK Department of health. London 2004.
3 Dean, B. and N. Barber (2001). "Validity and reliability of observational methods for studying medication administration errors." American Journal Of Health-System Pharmacy 58: 54-59.
4 Clinical resource and audit group. Good practice statement for the preparation of injections in near-patient areas, including clinical and home environments. 2002. NHS Scotland. Stationary office Edinburgh. UK.

Grant acknowledgement. Greater Manchester Supra District Audit

0138

TESTING THE MEDICATION CALCULATION SKILLS: A CRITICAL SKILL FOR THE ICU NURSE

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INTRODUCTION. Medication administration is one of the most responsible tasks of the ICU nurse. Poor medication calculation skills of ICU nurses are a serious risk for medication errors. Medication calculation skills of ICU nurses should be tested routinely and regularly. The aim of this study was to investigate the medication calculation skills of ICU nurses at one multidisciplinary Finnish ICU for adults (24 beds, approx 2000 patients/year, 90 nurses).

METHODS. An Excel-based medication calculation test containing 27 medication calculations was developed and implemented. So far 47 nurses have been tested and more results will be reported in April 2006. The calculations contained practical clinical examples and they were systematized from easy to difficult. The time limitation (20 minutes) for the test was used to represent the normal time pressure and workload in nursing practice. The calculations of the test had also a mathematical dimension. According to that 14 questions should be able to solve within 20 minutes time limitation. Immediate feedback and test results (paper version) were printed by the Excel application after the test.

RESULTS. The maximum of correct answers in 20 minutes time were 26 calculations and minimum 0 (unanswered). The average sum of the correct answers was 13 calculations within the test time limitation. Most errors were made with decimal points, conversions and dosage calculations.

CONCLUSION. Competent and safe medication administration needs regular testing. The study showed that ICU nurses need more practical exercises and time to revise their calculation skills. In our unit future directions should also focus on testing the pharmacological skills of ICU nurses.

0139

QUALITY IMPROVEMENT: EVALUATION OF BASIC KNOWLEDGE OF MEDICAL EQUIPMENT USED ON THE ICU

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INTRODUCTION. For each part of ICU equipment, the information provided includes an explanation of how it works, when and for how long it is generally used, and possible complications. The primary aim of our study was to evaluate the basic knowledge of frequently used medical equipment.

METHODS. By means of an anonymous questionnaire, all medical workers on our 4 different ICU's in our hospital were asked to answer the following:
1. Assume an oxygen cylinder with a content of 5 litres. The pressure is 100 bar. Your patient is receiving 10 ltrs/min.oxygen. How long will this oxygen supply last?
2. Choose the syringe pumps which is used on your ICU (Asena or IVAC). They are fully charged. How long will the battery of the syringe pump last?
The medical workers were not informed in advance about this questionnaire.

RESULTS. 58 medical workers completed the questionnaire. The results show that 45% answered question 1 correctly. Question 2 was answered correctly by 7% of the participants.

TABLE 1.

	Question 1 Correct	Question 2 Correct
Critical Care nurses (25)	9 (36%)	0
Staff Nurses (10)	6 (60%)	0
Student (4)	4 (100%)	1 (25%)
Junior (5)	2 (40%)	0
Fellow (6)	2 (33%)	0
intensivist (8)	3 (37.5%)	3 (37.5%)
total n = 58	26 (45%)	4 (7%)

CONCLUSION. Education is mainly directed at complicated equipment. The adequate functioning of basic equipment is taken for granted. Although this might be justified almost always, basic knowledge of this equipment should be improved just to be certain in exceptional situations.

0140

IMPLEMENTATION OF NURSE-DRIVEN HAEMODYNAMIC MONITORING USING PICCO

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INTRODUCTION. Pulse Contour cardiac output (PiCCO) is a less invasive method of continuous haemodynamic monitoring [1]. As with any equipment, familiarity, education, perceived usefulness and safety are important issues. Since nurses are constantly at the patient bedside, we reasoned that a nurse-driven approach for calibration and monitoring may be advantageous in terms of providing better consistency and quality of measurements, and act as an early warning system for intensive care unit (ICU) physicians.

METHODS. Over a 6-month period we educated ICU nurses in the use of PiCCO. We identified "core" personnel (3 nurses) who acted as reference persons with backup from 4 ICU physicians. The core personnel underwent a training program consisting of 1) a 60-minute lecture 2) computer based educational module 3) computer based competency test 4) practical simulation 5) bedside demonstration. Training was extended to all ICU nurses, consisting of a 45-minute theoretical and practical session, then supervised bedside training. Six months later, we issued a questionnaire to all nurses to evaluate the perceived value of education, ability to use PiCCO technically correctly, ability to identify haemodynamic changes and act upon them, and perceived technical difficulties.

RESULTS. 41 (of 52) nurses completed the program. We have monitored over 100 patients in our ICU (10 ventilated beds, 900 admissions/year) with one adverse event (bleeding at site of insertion requiring surgery).

% nurses agreeing to the following, after completing the program:	
Increased knowledge of haemodynamics	68%
Allowed earlier identification of problems and change in care	63%
Obtained necessary skills to carry out technically correct measurements	85%
Generally problem-free monitoring	73%

CONCLUSION. The nurse-driven PICCO program was implemented sucessfully. Most nurses felt that they had increased their knowledge of haemodynamics and obtained the necessary technical skills to carry out measurements correctly. Patient care was thought to have improved by earlier identification haemodynamic problems, resulting in changes in medical management. For our ICU, the program was an excellent way for increasing nurse awareness and the perceived quality/consistency of haemodynamic monitoring.

REFERENCE(S). 1. Sakka S G et al. Comparison of pulmonary artery and arterial thermodilution CO in critically ill patients. Int Care Med 1999; 25:843-6.

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0141

NURSES' KNOWLEDGE OF BASIC INTENSIVE CARE PRINCIPLES IN DIFFERENT HOSPITAL WORK ENVIRONMENTS

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INTRODUCTION. Patients requiring treatments previously only undertaken in critical care units are now being nursed in other ward areas. The objective of our study was to investigate the adequacy of ward-based nurses' knowledge and skills regarding acute care and rehabilitation of critical patients.

METHODS. Knowledge of basic aspects of critical care was assessed among a group of 462 nurses at the five General hospitals in Western Macedonia. A three-sections (demographic characteristics, acute care and rehabilitation) multiple choice original questionnaire was distributed to the nursing staff of each hospital to be voluntarily and anonymously filled in and returned at once. Nurses were requested to answer 8 questions of acute care related to equipment, drugs and techniques of CPR and 8 questions of rehabilitation related to tracheal suctioning, tracheostomy, lines and catheters placed in the ICU.

RESULTS. 207 nurses answered (44.79% of the total), 30 males and 167 females, having 11.25±7.64 years of previous practice and 10.52±2.79 average total score (maximum total score 16). 35.7% of them were working in a surgical department and 64.3% in a medical one. Factors related to a higher score of correct answers were a three-year education, the male sex and the number of attended nursing congresses. The questions with the higher and lower percentage of correct answers concerned tracheal suctioning, the use of self-inflating bag-valve mask apparatus (>80%) and the use of defibrillator (45.7%). 93.3% of the responders requested further training in intensive and emergency nursing. Main results are shown in the table.*P<0.001

TABLE 1.

	ICU, n=16	ER/Anestes/gy, n=47	Wards, n=144	Total, n=207
Total score	13.56±3.22*	10.72±2.22	10.11±2.71	10.52±2.79
Acute care score	6.50±1.46*	5.31±1.30	4.77±1.47	5.02±1.51
Rehabilitation score	7.06±2.01*	5.40±1.42	5.38±1.83	5.51±1.81

CONCLUSION. The results of this study suggest that the knowledge and practice of participants caring for critically ill patients on the wards must be improved. Providing continual critical care education and training opportunities such as nurses' rotation in the ICU, are the suggested ways to improve care and outcome for this highly dependent patient group.

0142

CREATING A LEARNING CULTURE TO PROMOTE INDEPENDENT PRACTICE IN CRITICAL CARE NURSING STAFF

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INTRODUCTION. Effective workplace cultures are known to be organisations which attract and retain staff by supporting individuals to develop skills needed for their practice (Aiken et al 1994). Current education strategies value competency development and reflective inquiry which are achieved by learning in and from practice (Flanagan et al 2000). Within our intensive care unit weaning protocols have been used. Feedback from nursing staff highlighted a subjective lack of knowledge relating to respiratory physiology and mechanical ventilation. They also wanted to develop skills to allow confident recognition of airway and respiratory problems and interpretation of information necessary for decision making. This information formed the basis of a programme of work aimed at promoting independent practice within a group of nursing staff.

METHODS. A study event was held with consultant medical staff, clinical educators and senior nurses. Eight junior nurses attended the day. Critical care nursing experience within this group ranged from 0 to 3 years. The expectations of each staff group regarding desired outcome and further support required to achieve this were identified. These expectations were evaluated after 6 months using individual interviews.

RESULTS. Notes from the interviews were themed with the purpose of identifying the important components of a learning culture within our critical care unit. The themes from each interview were amalgamated and the following identified by each staff group as being essential for a learning environment.

TABLE 1.

Consultants	Interested staff. Asking Questions.	Time. Team work.
Clinical Educators	Sustained approach. Realistic expectation	Time. Motivated staff.
Senior Nursing Staff	Mentorship. Good staff relations.	Role modelling. Opportunity to discuss.
Junior Nursing Staff	Learning with practical focus. Mentorship	Role modelling. Being asked questions.

CONCLUSION. Whilst formal and informal education is essential for enabling critical care staff to learn, the development of a learning culture requires other processes such as good relationships, mentorship and role modelling. Common to all groups of staff were the requirement for self-motivation and a culture of critical inquiry. Future education of staff to promote independent practice should incorporate these themes.

REFERENCE(S). Aiken L, Smith H & Lake E (1994) Medical Care 32(8)771 – 787.
Flanagan J, Baldwin S & Clarke D (2000) Journal of Clinical Nursing (9)360 – 368.

Poster Sessions
Acute respiratory failure: Miscellaneous
0143-0154

0143

A MURINE MODEL OF UNILATERAL ACID-INDUCED LUNG INJURY

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INTRODUCTION. Data concerning acid aspiration induced lung injury are mainly focused on the acute effects. Our aim was to develop a murine model of acid aspiration allowing animals' spontaneous breathing and long term survival. We also tested the efficacy of surfactant therapy in this model

METHODS. During mechanical ventilation hydrochloric acid (pH 1.5; 1.5 ml/Kg) was selectively instilled into the right lung of anesthetized CD-1 mice via an intratracheal angiocatheter. Mice were divided in 3 groups studied at 12 (12H, n=6), 24 (24H, n=23) hours and 2 weeks (2W, n=22). At each time, left ventricular blood was sampled and PV curve obtained. The lungs were removed for histological procedures and Wet to Dry (W/D) ratio determination. A CT scan was obtained in four 12H mice. In a different group of mice (12 HS, n=4) we evaluated the effect at 12 hours of early (10 minutes after injury) surfactant (2 ml/Kg) instillation.

RESULTS. 2 weeks survival was 73%. PaO_2 decreased at 12H and 24H and, to a lesser extent at 2 weeks. Histological injury was limited to the right lung and was more evident at 12H and 24 H than at 2W, the latter showing a small fibrotic scar and less inflammatory cells. Lung compliance, reduced in the first 24 hours was still below control values at 2W. The W/D ratio was increased in the first 24 hours but returned to normal at 2W. CT at 12H showed areas of consolidation in the right lung, associated to hyperinflation in the left lung. Both CT and histology showed a lower injury extension in 12HS compared to 12H, associated to improved gas exchange.

TABLE 1.

	Controls	12H	24H	2W	12HS
PaO2(mmHg)	109±6.1	79±17.73*	74±11.77*	98±8.44^	97±16.9
W/D Ratio	5.10±0.19		5.93±0.51*	5.22±0.34	

**vs controls:p<0.01;^p=0.053*

CONCLUSION. We characterized a murine model of acid aspiration, suitable for studying, both at short and long term, the evolution and/or possible therapies, like the administration of surfactant.

0144

WHOLE LUNG LAVAGE IN PULMONAR ALVEOLAR PROTEINOSIS: A 16 YEARS EXPERIENCE

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INTRODUCTION. We describe the whole lung lavage (WLL) technique adopted in our centre and report our series of patients with Pulmonary Alveolar Proteinosis (PAP) undergone this procedure.

METHODS. Between 1990 and 2006, 32 patients (25 females, 40±13 years) underwent WLL; 8 pts needed multiple lavages: overall WLLs were 46. Under general anesthesia, pts are ventilated through a double-lumen tracheal tube; invasive pressures, temperature, weight, respiratory mechanics, gas exchanges and electrolytes are monitorized. WLL is performed in lateral position: we ventilate the dependent lung and lavage the nondependent one with tidal volumes of warmed normal saline. Electrolytes continuously lost in a dialytic-like way are replaced. To improve the removal of intralveolar material we use chest wall clapping. Procedure ends when the fluid drained becomes clear.

RESULTS. Mean lenght of WLL was 4.9±1.4 h, volume of lavage fluid 48±10 l. ICU stay ranged 36-72 h. At the beginning of the procedure PaO2/FiO2 (P/F) was 229±83 mmHg (PEEP 4±2 cmH2O); P/F decreased during one lung ventilation to 89 ± 63 (PEEP 4±2) and 117±95 (PEEP 8±3) when lavaging the 1° and 2° lung; at the end of WLL (PEEP 8±2) P/F was 248±117. During the procedure pts developed moderate hypercapnia (PaCO2 47±7 mmHg; p<0.001 vs basal value), base deficit (BE -2.4±3 mEq/l; p<0.01) and acidemia (pH 7.32±0.01; p<0.001). The day after WLL Creatine Kinase (88±76 vs 59±39 U/l; p<0.01) and Lactic Dehydrogenase (654±232 vs 593±208 U/l; p<0.005) slightly increased. Complications: 1 bronchial lesion and several not clinically significant cases of electrolytes abnormalities, fluid overload and hypothermia; no cases of massive flooding of the dependent lung.

CONCLUSION. WLL is a very complicated and potentially harmful procedure requiring careful monitoring and expert operators to minimize complications. The severe hypoxemia may make not feasible the one lung ventilation in these pts. We face the problem optimizing ventilation/perfusion ratio by lateral positioning and ventilation of the dependent lung. Lateral decubitus also increases effectiveness of chest wall clapping. In our pts the gas exchange improvement, not evident soon after WLL, became significant 15 days later, persisting in most cases at long term follow up (1).

REFERENCE(S). 1 Beccaria M et al. Long term durable benefit after WLL in PAP. Eur Respir J 2004; 23(4): 526-31.

0145

BIOTRAUMA WITH PRESSURE AND VOLUMES MODES IN NORMAL LUNG

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INTRODUCTION. High peak inspiratory volumes and pressures and high mean airway pressures are predisposing factors for lung injury (Biotrauma). These are usually associated with volume controlled ventilation (VCV). Pressure controlled ventilation (PCV) may be beneficial due its advantages on respiratory mechanics. Studies comparing the effects of two modes in ARDS were inconclusive, could be due to confounding variables. We hypothesise release and temporal trend manifestation of the airway inflammatory mediators in patients with normal lungs reflecting biotrauma resulting from two different modes of ventilation.

METHODS. After IRB approval and informed consent,15 adult surgical patients were randomised into two groups to receive PCV (G1, n=7) or VCV (G2, n=8). ARDSNET protocol followed for ventilation in either mode for 24 hours, using total intravenous anaesthesia. IL6, IL8 and TNFalpha were measured at 4 periods ie at 0, 6, 12 and 24 hours in the BAL specimens using ELISA method. Statistical analysis was performed using non-parametric repeated measures ANOVA (Friedmans test). Posthoc analysis was done for multiple pairwise comparisons.

RESULTS. Depicted in Table 1.

TABLE 1.

	G1 IL6 pg/ml	G1 IL8 pg/ml	G1 TNF pg/ml	G2 IL6 pg/ml	G2 IL8 pg/ml	G2 TNF pg/ml
0 Hr Median	13	1260	32	27	620	50
0 Hr IQR	(6.4-60)	(620-1260)	(32-166)	(8.3-81.5)	(575-1765)	(32-64)
6 Hr Median	16	1300	32	35.5	1600	40
6 Hr IQR	(9-68)	(800-1600)	(16-604)	(18-63.5)	(665-2825)	(16-566)
12Hr Median	100	1450	16	93	1430	16 **
12Hr IQR	(44-150)	(560-5000)	(16-135)	(24-145.5)	(745-2575)	(16-52)
24Hr Median	62	560	16	142	620	16 *
24Hr IQR	(30-100)	(320-2000)	(16-232)	(55-230)	(560-1860)	(16-28)
p Value	0.134 (NS)	0.698 (NS)	0.623 (NS)	0.126 (NS)	0.510 (NS)	0.007 (S)

CONCLUSION. Mechanical ventilation of normal lungs results in biotrauma. There is a trend towards increase in IL6 and signiicant reduction in TNFalpha levels at 12 and 24 hour period noted during volume ventilation. It warrants further investigation in a larger sample to validate these findings

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0146

EFFECTS OF INHALED NITRIC OXIDE ON GAS EXCHANGE DURING PARTIAL VENTILATOR SUPPORT

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INTRODUCTION. Preservation of spontaneous breathing activity and inhaled nitric oxide (iNO) have both been recommended to overcome severe hypoxemia in patients with ARDS. The aim of this study was to determine effects of iNO on ventilation-perfusion (VA/Q) distribution during different modes of partial ventilator support (PVS) in experimental acute lung injury (ALI).

METHODS. 24 pigs with ALI were randomised to four groups ventilated with assist-control (A/C), volume assured pressure support (VAPS), pressure support (PS) or biphasic positive airway pressure (BIPAP). In each group, controlled mechanical ventilation (CMV) and PVS were performed for one hour each followed by 15 minutes of 10 ppm iNO. VA/Q distributions were determined after CMV and PVS with and without iNO.

RESULTS. In all groups, iNO increased perfusion to lung areas with normal VA/Q distribution thereby reducing shunt during CMV and PVS (see table). In contrast, significant improvements of VA/Q distribution due to PVS were only determined for PS and BIPAP. However, even in these groups improvements of VA/Q distributions due to combined PVS+iNO did not reach statistical significance when compared to CMV+iNO.

TABLE 1.

	Mode	CMV	CMV+iNO	PVS	PVS+iNO
Shunt [%]	A/C	49 ± 5	29 ± 14*	43 ± 13	30 ± 13*
	VAPS	46 ± 11	30 ± 11*	41 ± 12	28 ± 10*
	PS	48 ± 14	31 ± 14*	35 ± 17#	27 ± 14*
	BIPAP	48 ± 6	24 ± 9*	33 ± 9#	19 ± 6*
Normal VA/Q [%]	A/C	50 ± 5	70 ± 14*	55 ± 14	68 ± 14*
	VAPS	53 ± 10	70 ± 11*	58 ± 12	71 ± 9*
	PS	52 ± 14	69 ± 14*	64 ± 17#	72 ± 14*
	BIPAP	52 ± 7	76 ± 9*	65 ± 10#	79 ± 5*

** p<0.05 for CMV+iNO vs. CMV and PVS+iNO vs. PVS; # p<0.05 for PVS vs. CMV*

CONCLUSION. VA/Q distribution in ALI can be improved by iNO or spontaneous breathing with PS or BIPAP. Combined iNO and PS or iNO and BIPAP had no additional beneficial effects on gas exchange in this study, possibly due to a reduced amount of intrapulmonary shunt.

0147

DETERMINANTS OF TIDAL VOLUMES (VT) WITH ADAPTIVE SUPPORT VENTILATION (ASV)

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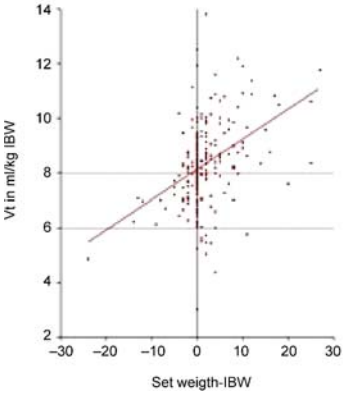
INTRODUCTION. ASV is a microprocessor-controlled mechanical ventilation mode that independent of the patients' activity maintains a preset minute ventilation as a function of patients' ideal body weight (IBW). Tidal volume (VT) is chosen by the ventilator. We determined which factors influence VT with ASV, such as institute, patients' height and weight, level of positive end-expiratory pressure, gender and the difference between set weight (set-W) and (IBW).

METHODS. We prospectively collected data of 270 consecutive post-cardiac surgery patients in 3 Dutch IC units

RESULTS. Mean VT was 8.3.± 1.6 ml/kg IBW. In 43.3% the correct W was used; in 16.5%, 40.2% set-W was too low or too high respectively. A wrongly set-W was the only factor that influenced VT ($P < 0.05$), as shown in the graph.



CONCLUSION. Incorrectly set W in ASV results in undesirable large VT.

0148

PANCREATITIS - ASSOCIATED PROTEIN: DOES IT REFLECT ACUTE LUNG INJURY IN THE SEVERELY ILL?

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INTRODUCTION. Pancreatitis-associated Protein (PaP) was first described as being expressed during acute pancreatitis. A variety of publications suggest that PaP expression is not only induced during pancreatitis. Looking onto the expression of PaP in severely ill patients of a surgical/neurosurgical intensive care unit (ICU), we focus here on plasma levels of PaP in relation to the degree and duration of respiratory failure.

METHODS. 185 consecutive patients of a surgical ICU were reviewed. Inclusion criteria were an assumed ICU stay of at least 6 days. Exclusion criteria were refused consent, previous pancreatic disease, operations of the pancreas, alcohol abuse, pregnancy, age of less than 16 years. Plasma levels of PaP were examined on a daily base. Murray (lung injury) and APACHE II (severity of disease classification) scores were calculated. Patients were divided according to amount and duration of ventilator support. Groups were compared according to their maximum plasmatic PaP levels and their initial PaP level (maximum within the first three days on ICU). Mean values were calculated and groups compared by t-test.

RESULTS. A total of 87 patients were included (34 women, 53 men, mean age 45 years, mean time on ICU 17 days, 22 died, mean APS 6.8, 48 trauma patients, 39 non-traumatic). Low maximum PaP levels were found in patients with 5 or less days of ventilation during their ICU stay (mean 468 ng/ml, n=12). Mean maximum PaP rose up to 885 ng/ml (n=29) in patients being ventilated 6 to 10 day during their ICU stay, and up to 2515 ng/ml (n=43) when being ventilated for more than 10 days. These differences for short and long ventilation periods were significant (p=0.00002 for <=5 vs >5 days of ventilation and p=0.0003 for <=10 vs >10). No statistically significant difference was found for initial PaP levels in severely ill patients in relation to total days of ventilation. Mean initial PaP levels were 116/192/450 ng/ml for total ventilator time of <=5/5-10/>10 days of ventilation.

CONCLUSION. Significantly higher plasmatic PaP levels were seen in patients with longer duration of ventilation. Our data do not support any predictive value of early plasmatic PaP measurement on the degree of respiratory failure in intensive care patients.

0149

THE EFFECTS OF CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) AFTER ABDOMINAL SURGERY. A META-ANALYSIS

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INTRODUCTION. Postoperative pulmonary complications (PPCs) are the most important determinants of acute respiratory failure (ARF) in postoperative abdominal patients with an increased risk of prolonged ICU stay due to mechanical ventilation requirements. In the present study we evaluated the efficacy of the early use of continuous positive airway pressure (CPAP) to prevent pulmonary complications, atelectasis, pneumonia, and endotracheal intubation in patients recovering from abdominal surgery.

METHODS. MEDLINE, EMBASE and COCHRANE database, were searched to identify relevant randomized controlled clinical trials examining the use of CPAP versus standard therapy in patients undergoing abdominal surgery. Outcomes were extracted from these articles, and a meta-analysis was performed.

RESULTS. 9 randomized controlled trials reached standard of quality and were included in the analysis. Overall, CPAP significantly reduced PPCs by 41%, atelectasis by 37%, and pneumonia by 67% in comparison to standard treatment (O2 treatment by face mask). Heterogeneity was negligible. CPAP showed a significant decrease of endotracheal intubation rate (RR 0.15;95% CI of 0.034 to 0.66).

TABLE 1.

	PPCs	Pneumonia	Atelectasis
Controls (nº)	339	265	104
CPAP (nº)	334	259	99
Controls events (nº)	59	24	53
CPAP events (nº)	29	7	29
Overall (RR) (95%CI)	0.59 (0.40 to 0.86)	0.33 (0.14 to 0.75)	0.63 (0.47 to 0.84)

CONCLUSION. This systematic review of RCTs of early CPAP treatment in postoperative abdominal patients suggests that CPAP decreases PPCs in general, atelectasis, and pneumonia.

0150

PULMONARY DISORDERS DURING PREGNANCY AND IN THE PERIPARTUM: CAUSES, COURSES AND OUTCOME

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INTRODUCTION. Many physiologic changes affect respiratory system and all organ during pregnancy. The respiratory system undergoes changes and is subject to additional functional and anatomic stresses. Pathophysiologic processes may result in significant ventilatory compromise, adversely affecting maternal and foetal oxygenation (1).

METHODS. We conducted a prospective study over 5 years (July 2000 to June 2005) involving 116 women with pulmonary disorders in pregnancy (PDIP). These patients were selected among 389 obstetrical patients admitted in our Intensive Care Unit. The diagnosis of pulmonary disorder was made on the basis of clinical data, arterial blood gas, and/or a pulmonary artery monitoring wedge pressure of at least 18 mmHg, findings that were confirmed by chest X-ray or CT-angiography.

RESULTS. PDIP incidence in our series was 29.8%. Thirty seven percent of our patient were primigestous, 41% were primiparous, and 58% were multiparous. Matrenal age average was 32 years (19 to 44). Eighty percent of women underwent caesarean section; spontaneous delivery was observed in 17% and 32% were instrumentally delivered.
Pre-existing medical consists of cardiovascular diseases (n=14; 12%), thromboembolic events (n=2; 1.7%), asthma (n=3; 2.5%), hypothyroidism (n=1; 0.8%) and diabetes (n=1; 0.8%).
PDIP was attributes to eclampsia (55%), to obstetrical sepsis (19%) and to haemorrhage (26%). Eighty nine percent of patients required mechanical ventilation. Global maternal mortality was 14%. Causes of death was septic shock (n=5), intracerebral haemorrhage (n=3), cardiogenic shock (n=3) and pulmonary embolism (n=1) and inhalation syndrome (n=5).

CONCLUSION. PDIP is a serious complication. Patient at risk should be delivered in appropriate conditions. Close collaboration between obstetrics and ICU department may improve prognosis of such patients.

REFERENCE(S).
1. Graves CR. Acute pulmonary complications during pregnancy. Clin Obstet Gynecol. 2002 Jun; 45(2):369-76.

0151

ARTERIAL OXYGENATION EQUILIBRATION TIME FOLLOWING ALTERATION OF FIO2 IN INTUBATED ICU PATIENTS

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INTRODUCTION. Arterial blood gas analysis (ABGs) remains the gold standard for estimating oxygenation status. Clinicians are concerned about the optimal time period to be allowed before obtaining a blood sample following a change in oxygenation settings. The exact timing for ABGs measuring in ICU patients (pts) with oxygenation impairment has not yet been well documented. The purpose was to determine the time required for the arterial oxygen tension (PaO2) to reach equilibrium after a 0.3 change in fractional inspired oxygen (FiO2), in mechanically ventilated (MV) ICU pts.

METHODS. We studied 20 adult MV pts (10 men, 10 women) admitted in a 7-bed multidisciplinary university ICU, using serial ABGs measurements. The pts were on ACMV and divided in 2 groups according to the PaO2/FiO2 ratio (1>200=10 pts, 2<200=10 pts). Their oxygenation and hemodynamic status was stable on the day of the study. The initial FiO2 was selected according to the pt needs for an adequate PaO2. Following two baseline PaO2 measurements at the initial FiO2 at 5 min intervals, to confirmed respiratory stability; the FiO2 was increased by 0.3 for 30 min and then decreased by 0.3 returning to the initial value, without any other change in respiratory or hemodynamic parameters. Sequential ABGs measurements were performed in 3,6,9,12,15,20,25 & 30 min in both periods. The mean PaO2 values of the PaO2 measured at the 20, 25 & 30th min after a step change in FiO2 in both periods were accepted as representative of the equilibrium values for PaO2. The mean time required for partial pressure of arterial oxygen equilibration during mechanical ventilation after a step change in fractional inspired oxygen concentration. oxygenation equilibration time, defined as the time required reaching the final equilibrated PaO2 (1+/-0.1), was calculated. All variables were tested for normality (K-S test). Student's t-test & Mann-Whitney U test were performed where appropriate, and P<.05 was considered statistically significant. Data are expressed as mean+/-SD.

RESULTS. The mean equilibration time for rises in PaO2 was 6.89+/-4.64 min for all pts, 6.9+/-4.25 min for the pts with PaO2/FiO2<200 & 6.88+/-5.30 min for the pts with PaO2/FiO2>200. The mean equilibration time for falls in PaO2 was 4.58+/-2.32 min for all pts, 4.8+/-2.53 min for the pts with PaO2/FiO2<200 & 4.33+/-2.18 min for the pts with PaO2/FiO2>200. There was no significant difference between the rise and fall periods for the two parameters in both groups (p>0.05).

CONCLUSION. We conclude that after a 0.3 alteration of FiO2, a 6.89+/-4.6 and 4.58+/-2.32 min equilibration time period is adequate for the increase or decrease in PaO2 respectively to occur, in stable MV ICU pts.

REFERENCE(S). Sasse S A, et all. Am J Respir Crit Care Med 1995;152(1):148-52
Cacar N, et all. Intensive Care Med 2001;27(4):655-9.

0152

IS HYPERGLYCAEMIA ASSOCIATED WITH POOR OUTCOME FROM MECHANICAL VENTILATION

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INTRODUCTION. Hyperglycaemia is associated with poor outcomes from pneumonia, myocardial infarction, stroke and acute respiratory failure in chronic obstructive pulmonary diasease (1, 2). A study was undertaken to determine the relationship between mechanical ventilation, presence of diabetes, mortality and duration of mechanical ventilation.

METHODS. Data were retrieved from medical records for patients admitted in 2005 to medical intensive care unit with acute respiratory failure and mechanically ventilated (92 patients). The patients were grouped according to presence of diabetic hyperglycaemia (25 patients, 27%), survival, duration of mechanical ventilation. Blood glucose level was determined on admission. Student t test was used to assess differences between groups.

RESULTS. 67 patients (73%) were normoglycaemic nondiabetics. 44 (66%) survive mechanical ventilation. Their mean duration of mechanical ventilation was 9.9 days. Nonsurvivors (23 pts, 34%) were mechanically ventilated for 11.6 days (p NS). 25 patients (27%) were known diabetics. Survivals (16 pts, 64%) have an average blood glucose level of 9.3 mmol/l and were mechanically ventilated 5.2 days. Nonsurvivors (9 pts, 36%) have an average blood glucose level 13, 5 mmol/l (p 0.13) and were mechanically ventilated for 8.5 days (p 0.05).

CONCLUSION. The presence of diabetic hyperglycaemia is not associated with increased mortality in mechanically ventilated patients. In isolated group of diabetic patients increasing hyperglycaemia increases mortality. A prospective study is required to determine whether control of blood glucose can improve survival of diabetic patients with acute respiratory failure.

REFERENCE(S). 1. Baker E H et al. Hyperglycaemia is associated with poor outcomes in patients admitted to hospital with acute exacerbations of chronic obstructive puulmonary disease. Thorax 2006; 61: 284 – 289.
2. Finney S J, Evans T W. Tight glycaemic control in acute exacerbations of COPD. Thorax 2006; 61: 275 – 276.

0153

PERCUTANEOUS CHEST TUBE INSERTION: IS THE "SAFE TRIANGLE" SAFE FOR THE LUNG?

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INTRODUCTION. Percutaneous chest tube insertion is frequently performed in critically ill patients. A lateral site of insertion, in the "safe triangle", is recommended in patients lying supine to limit the risk of vessel injury and to avoid unsightly scar. Using this route, however, the chest tube might frequently enter the pleural space above the upper level of a pleural effusion and/or below the inferior limit of a pneumothorax, increasing the risk of chest tube malposition.

METHODS. During an 18-month period, the charts of all patients admitted in the surgical intensive care unit with one or several percutaneously inserted chest tubes visible on thoracic CT scan (TCT) were reviewed. Among them, only patients who had had a TCT in the 24 hours preceding tube insertion were analyzed for the present study. By comparing the two TCT, it was possible to measure the distance existing between parietal and visceral pleural layers at the level of the intercostal space through which the chest tube was inserted. The local ethic committee (CCPPRB of CHU la Pitié Salpétrière) approved the protocol that did not require informed consent.

RESULTS. 39 chest tubes (20 right and 19 left) inserted in 30 patients (age 44 ± 17 years, SAPS II = 38 ± 17) for pleural effusion or hemothorax (61%), pneumothorax (21%), or both (18%) were reviewed. The mean drained volume of pleural effusion was 588 mL (± 418 mL). The distance between parietal and visceral pleura at the insertion site of the chest tube was superior to 10 mm in 5 cases, less than 10 mm in 10 cases, and pleural space was virtual in 24 cases (61%). Among the 24 tubes inserted in a virtual pleural space, 7 were intraparenchymal whereas the 15 tubes inserted in a fluid- or air-filled pleural space were all correctly positioned (p = 0.03, exact Fisher test).

CONCLUSION. Physicians should keep in mind that when inserting percutaneously a chest tube by the lateral route, they may enter the thorax through a virtual pleural space, a situation that predisposes to intraparenchymal placement of the chest tube.

REFERENCE(S). Laws D, BTS guidelines for the insertion of a chest drain, Thorax. 2003; 58(suppl II): i53-i59, Tang ATM, An evidence based approach to drainage of the pleural cavity: evaluation of best practice, J of Eval Clin Practice. 2002; 8(3): 333-340.

0154

BRONCHOSCOPIC SUCTIONING MAY RESULT IN LUNG COLLAPSE

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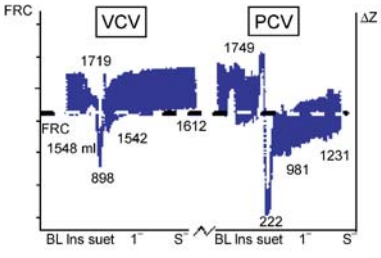
INTRODUCTION. Closed system suctioning, using large catheters in narrow endotracheal tubes may cause lung collapse [1]. Suctioning through a bronchoscope inserted through a tight seal connector may have similar effects. Our aim was to evaluate suction flow through a bronchoscope and monitor changes in functional residual capacity (FRC) during suctioning.

METHODS. Suction flow at vacuum levels of –20 to -80 kPa was measured. In 3 ICU patients, a 16 Fr bronchoscope was inserted during volume and pressure control ventilation (VCV, PCV). FRC was monitored with electric impedance tomography calibrated by a nitrogen washout method. Tracheal pressure (Ptrach) was monitored via a 1.1 mm polyethylene catheter via the ETT lumen.

RESULTS. Suction flow through the bronchoscope was 17, 11, 8, and 5 l/min at vacuum levels of -80, -60, -40 and –20 kPa. During insertion FRC increased with 171-585 ml and decreased with 148-1326 ml during suctioning. In PCV Ptrach decreased to subatmospheric levels, -24 – 0 cmH2O (range). After removal of the bronchoscope, FRC returned to baseline in VCV but not in PCV. See graph.



CONCLUSION. Suction flow through the bronchoscope at the vacuum levels used is above minute ventilation in most ALI patients. During suctioning, the ventilator was unable to deliver enough volume in both VCV or PCV to maintain FRC. In PCV tracheal pressure decreased below atmospheric pressure.

REFERENCE(S). 1. Stenqvist O et al. Acta Anaesthesiol Scand 2001, 45(2):167-172.

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Special issues in systemic inflammation
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0155

DOES PROPOFOL AFFECT THE SERUM LEVELS OF APOLIPOPROTEIN A-I AFTER SURGERY? PRELIMINARY RESULTS

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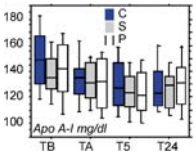
INTRODUCTION. Apolipoprotein A-I (Apo A-I), the major protein component of HDL, decreases during the acute phase of inflammation. In vitro, Apo A-I specifically inhibits the contact-mediated activation of monocytes by stimulated T cells, decreasing the production of inflammatory mediators. Propofol (Prop) widely used as an anesthetic agent, dissolved in a lipid emulsion, is highly lipophilic. In vitro, Prop seems to modulate the inflammation. The aim of this study was to evaluate whether Prop modulates in vivo the concentration of Apo A-I after a surgical stress. The secondary objective was to investigate whether it is Prop, or its solvent that is responsible for the action on Apo A-I.

METHODS. Triple blind RCT in patients undergoing laparoscopic hernia repair comparing 3 different anesthesias: Group P: induction and maintenance with Prop, Group S: without Prop but with its solvent, Group C: without Prop or solvent. We assessed Apo A-I before (TB), after (TA) induction of anesthesia, 5 (T5) and 24 (T24) hours after the surgical stress.

RESULTS. 79 patients were included (P=25, S=27, C=27). Patients characteristics, SIRS, the durations of anesthesia and surgery were similar in the 3 groups. Apo A-I changed over time (p< 0.001) in the 3 groups (figure). The difference between Apo A-I at TB and T24 was smaller in P and S compared to C [median (IQR): P: 13(6-20); S: 9(4-18); C: 20(11-27), p=0.03](fig).



CONCLUSION. Prop and its solvent seem to modify the Apo A-I during the first 24 hours after the surgical stress. The mechanism by which Prop or its solvent modulate inflammation should be further investigated.

0156

EXHALED CARBON MONOXIDE CONCENTRATION IN PATIENTS WITH HYPERBILIRUBINEMIA

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INTRODUCTION. Carbon monoxide (CO) and bilirubin are produced by heme catabolism due to induction of heme oxygenase-1 by inflammation. Since increased endogenous CO production has been reported in patients with severe sepsis (1), this study was undertaken to determine the correlation between exhaled CO and plasma bilirubin concentration in patients with hyperbilirubinemia.

METHODS. Sixteen adult patients with hyperbilirubinemia (total plasma bilirubin level greater than 2mg/dL) including 3 without systemic inflammatory response syndrome (SIRS), 9 with SIRS, and 4 with sepsis and eight control patients without hyperbilirubinemia without SIRS (4 patients) or with SIRS (4 patients) were studied. Exhaled CO concentrations in end-expiratory air samples collected into a plastic bag were measured using a CO analyzer (Carbolyzer mBA-2000, Taiyo, Osaka, Japan) with a sensitivity of 0.1 ppm. Measurements of exhaled CO, arterial carboxyhemoglobin (CO-Hb) using a blood gas analyzer (ABL700-series, Radiometer, Copenhagen, Denmark) and of total plasma bilirubin levels were performed several times for each patient. Data analyses were performed with Student's unpaired t-test or Spearman's rank correlation test.

RESULTS. In 7 healthy volunteers, exhaled CO level was 2.2±0.4 ppm, which was significantly (P<0.01) less than that in the control group (2.9±0.9 ppm). Exhaled CO and CO-Hb levels were significantly (P<0.01) greater in patients with hyperbilirubinemia than in the control group (5.1±1.9 versus 2.9±0.9 ppm, 1.7±1.1 versus 0.8±0.5%, respectively). A moderate correlation was found between exhaled CO and bilirubin concentration for the 13 patients with hyperbilirubinemia and SIRS/sepsis (rs=0.496, P<0.05), although no correlation was found between the two for the 16 patients with hyperbilirubinemia. For the 13 patients with hyperbilirubinemia and SIRS/sepsis, a good correlation was found between percent change in exhaled CO concentration and that in bilirubin level (rs=0.780, P<0.01).

CONCLUSION. Increase in exhaled CO concentration may be an important indicator of overproduction of bilirubin due to inflammation in patients with hyperbilirubinemia and SIRS/sepsis.

REFERENCE(S). (1) Zegdi R, et al. Intensive Care Med. 2002; 28:793-6.

0157

SERUM LEVELS OF PCT AND CRP IN PATIENTS UNDERGOING LIVER TRANSPLANTATION AND RESECTION

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INTRODUCTION. The aim of our study was to compare PCT and CRP serum levels in patients post orthotopic liver transplantations (OLTx) with and without the administration of anti-thymocyte antibodies (ATG Fresenius) and without any complications.

METHODS. Serum samples from patients after OLTx (21 recipients with and 7 recipients without ATG therapy) were evaluated. PCT and CRP serum concentrations were measured in OLTx recipients before induction of anesthesia, at hours 4 and 8 following graft reperfusion, and daily until post-operative day 4. PCT was also determinated in 12 patients undergoing liver resection.

RESULTS. PCT serum levels were slightly elevated (up to 14 ng/ml) in several patients after OLTx without ATG therapy. PCT was strongly induced in patients after OLTx with ATG administration (up to 249 ng/ml). The mean value of maximum PCT concentration was on first post-operative day 4.5±1.6 ng/ml in patients after OLTx without ATG therapy and 59.0±12.6 ng/ml in patients with ATG therapy (p<0.001). In addition, both groups are compared with 12 patients undergoing liver resection, whose mean serum PCT levels did not exceed 1.4±0.3 ng/ml. CRP serum levels in group of patients after OLTx with ATG therapy markedly increase four hours after graft reperfusion (22.6±3.2 mg/l), the highest level was post-operative day 1 (83.7±10.4 mg/l) followed by a decrease over the next days. In the group after OLTx without ATG therapy, there was a significant increase of serum CRP levels in post-operative day 1 (80.2±13.6 mg/l) followed by a decrease. In patients after liver resection the CRP level was highest on the second post-operative day (55.3± 12.0 mg/l) with decrease until post-operative day 4.

CONCLUSION. Polyclonal antibody administration to patients with OLTx is associated with a very marked increase in serum PCT levels, with peak values on post-operative day 1. However, this is without a clinical correlation in the form of a severe inflammatory response. The possible PCT release following ATG therapy should be taken into account when using this inflammatory parameter in transplant patients. The results of the study indicate that not only infectious inflammation is a stimulus for procalcitonin synthesis.

0158

TYPE OF SURGERY INFLUENCES SERUM SOLUBLE FAS (SFAS) IN PATIENTS UNDERGOING CARDIAC SURGERY

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INTRODUCTION. The Fas-Fas ligand system is recognized as a major pathway for the induction of programmed cell death (apoptosis) (1). Cardiopulmonary bypass (CPB) causes systemic inflammation and suppression of the immune response. Termination of inflammatory response is effected through apoptosis. However, the role of apoptotic protein sFAS during cardiac surgery remains obscure (2). The aim of this study was to compare the influence of cardiac surgery with or without CPB on protein sFas and thus a possible influence on postoperative immunosuppression.

METHODS. After approval by the local ethics committee and written informed consent from the individuals, 83 patients with a diagnosis of single or double vessel coronary disease undergoing coronary artery bypass grafting (CABG) were enrolled in the study (mean age 66 [35-85]). Of the patients, 47 underwent CABG with CPB (on-pump group), and the remaining 36 without CPB (off-pump group). Blood samples were drawn before surgery (T1), at the end of CPB or after finishing coronary revascularization on the beating heart (T2) and 12 hours postoperatively (T3). Serum concentration of sFas was measured by a sandwich enzyme-linked immunosorbant assay kit.

RESULTS. There was no statistical difference between groups with regard to age, gender and SAPS II score. The sFas levels before surgery were comparable in both groups (on-pump group vs. off-pump group, means ± standard deviation: 3.1±0.9 vs. 3.6±1.4 ng/ml). At T2 sFas levels were significantly lower in both groups as compared to T1 (on-pump: 2.7±0.9; p<0.05, off-pump: 3.1±1.2; p<0.05), without significant difference between groups. Nevertheless, the mean drop of sFas level was higher in the off-pump group. The mean values almost returned to baseline at 12 h after surgery in on-pump patients (2.8±1.3). In off-pump patients the lower sFas levels persisted 12 h after surgery (3.0±1.5, p<0.05).

CONCLUSION. Cardiac surgery causes a significant transient drop of sFas serum concentrations. In vitro sFas inactivates the Fas ligand and acts as an inhibitor of apoptosis. Lower serum concentrations of sFas might cause increased apoptosis of immune cells and thus the immunosuppression after cardiac surgery.

REFERENCE(S). 1. Oberholzer C, Oberholzer A, Clare-Salzler M, Moldawer L L. FASEB J 2001, 15:879-892 2. Kawahito K, Misawa Y, Fuse K. Artif Org 2000, 24(8):628-631.

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0159

CONTINUOUS HEMOFILTRATION IN HYPERTHERMIC SEPTIC SHOCK PATIENTS

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INTRODUCTION. Severe hyperthermia commonly accompanies septic shock. High body temperature in absence of infection activates the inflammatory response, and is associated with a high mortality. Three years ago, our hypothesis that sustained fever is harmful in septic shock, led us to the development of a protocol aiming at decreasing hyperthermia (> 39.5˚C) by means of hemofiltration when the patients did not respond to antipyretics. We present a report of temperature and hemodynamic changes and outcome of 19 consecutive hyperthermic septic shock patients with multiorgan system failure and compare them with a historical similar group of patients in whom hyperthermia was not treated with hemofiltration.

METHODS. Depending on renal function, patients were treated with continuous low-flow hemofiltration (n=8) or hemodiafiltration, (n=11). In all cases a PRISMATM (Gambro, USA) with a AN69 polyacrylonitrile filter (Hospal, France) was used. Core temperature was registered every hour. A hemodynamic index (HI) was defined (mean arterial pressure/noradrenaline dose) and used during the first 24 hours to describe the patients' hemodynamic profile by means of its percent variation starting 6 hours prior to instituting the hemofiltration.

RESULTS. No differences regarding age (p = 0.33), APACHE II (p = 0.73), SOFA score (p = 0.8) or HI at the moment of the diagnosis of hyperthermic septic shock (p = 0.9) were observed between both groups. All patients had multiorgan system failure involving, at least, the cardiovascular and respiratory systems. The patients' temperature decreased linearly from 39.8 ± 0.5˚C prior to hemofiltration to 37± 1.2˚C after 24h of treatment (p<0.001). The HI decreased significantly from –6 h to the onset of hemofiltration (p=0.002) and increased significantly after 24 h (p = 0.008). 28-day mortality was 32% (6/19) as compared to 100%(11/11) in the historical group (p<0.001).

CONCLUSION. Continuous low-flow hemofiltration decreased body temperature and vasopressor requirements in hyperthermic septic shock patients. The mortality was unexpectedly low.

REFERENCE(S). Marik P E. Fever in the ICU. Chest 2000; 117:855-869.
Bouchama A, Knochel J P. Heat stroke. N Engl J Med 2002; 346:1978-1988.

0160

LOW MORTALITY WITH DELAYED SURGERY FOR SEVERE ACUTE PANCREATITIS (SAP)-ROLE OF ICU

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INTRODUCTION. A new approach to SAP, which entails specialist centre referral, wide bore percutaneous drainage of infected necrosis and delayed (mean 41 days) surgery, is associated with a low mortality (5.7%) [1]. This study analyses the level of Intensive Care input required to effect this approach.

METHODS. Retrospective chart and ICU database review of all patients admitted from January 1999-March 2005 with SAP.

RESULTS. Of the 35 patients described, 21 (60%) required ICU admission. Two other patients were admitted acutely to ICU and died < 48hrs before specialist surgical referral. All patients followed the described delayed surgical approach complemented by critical care interventions. Results are expressed as mean values and (range). The Imrie score on admission was 3 (1-5). The length of stay in ICU was 53 (3-143) days, and in hospital was 98 (24-300) days. Nineteen patients were mechanically ventilated for 24 days (1-108), five requiring percutaneous tracheostomy. Vasoactive therapy (noradrenaline+/-dobutamine) was indicated in 19 patients (90.4%) and CVVHDF was instituted in 7 patients (33%). Seven (1-17) CT scans were performed per patient, with 3 (0-7) CT guided drains inserted per patient. Eight (2-21) different organisms were grown from 14 (3-38) sites per patient. Eleven patients required parenteral nutrition.
Mortality was 2/21 (9.5%) in the ICU surgical group; 4/23 (17.4%) in the overall ICU group.

TABLE 1.

Peak and pre-operative APACHE II and SOFA scores

	Peak	Pre-op
APACHE II score	15 (9 to 28)	8 (1 to 17)
SOFA score	6.5 (2 to 12)	3 (0 to 8)

CONCLUSION. The intensity of critical care support was high but associated with a significant fall in illness severity scores and a very favourable outcome. This suggests that ICU is central to the multidisciplinary approach in patients with SAP.

REFERENCE(S). 1. Delayed surgical intervention in acute severe pancreatitis improves patient outcome and reduces complications. Pancreatology 2003; 3: 209 (40). Conneely JB et al.

0161

SUSTAINDED HEAT STROKE INCREASES MORTALITY AND NEUROLOGIC SEQUELAE

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INTRODUCTION. Heat stroke is a life-threatening illness defined by an elevated core body temperature above 40˚C with central nervous system dysfunction which often results in neurological disabilities due to cellular destruction at extreme temperatures. We studied organ failure in relationship to duration of heat stroke [DHS] (time to hospital admission plus time to return at normal body temperature) to test the hypothesis that sustained HS is associated with increased morbid/mortality.

METHODS. During August 2003 sixty-six adult patients with heat stroke in absence of other etiologies explaining the hyperthermia were admitted to 14 ICU in Europe for organ support and included in a multicentric retrospective study. For each patients DHS, severity scores, organ failure (SOFA) including cardiac failure assessed as serum troponin and endocrine failure assessed as ACTH test, Glasgow Outcome Score (GOS) at leaving from hospital and mortality were recorded. Patients were divided into two groups according to the median (12hrs) and early death:A for patients with DHS < 12 and B: patients with DHS > 12 and dead in hyperthermia.

RESULTS. Sixty-six patients with HS in absence of other etiologies explaining the hyperthermia took part at the study. Thirty-one died (47%) in ICU, 43 (65%) at hospital. SAPS II and SOFA score were associated with DHS. Troponin and cortisol were not different in the two groups while incidence of death (9 vs. 34, p<0.001), sepsis (4 vs.10, p=0.05) and neurologic disabilities (p<0.0001) was lower in sustained HS than in non-sustained HS group.

TABLE 1.

	Total	Group A	Group B	p value
SAPS II, mean	65	60	68	0.04
Neurol sequelae (GOS)	34	6	28	< 0.0001
Dead	43	9	34	< 0.0001
Sepsis	14	4	10	0.05

CONCLUSION. The 2003 heat wave resulted in an elevation of the hospital and ICU deaths rates especially in France. Despite adequate cooling and supportive therapies, mortality of patients admitted to ICU for HS remained elevated. DHS was associated with death, incidence of sepsis and neurological dysfunction, but not with cardiac and adrenal failure. Early management of HS reduce (12 hrs in our study) incidence of mortality and neurologic sequelae.

0162

PERITONITIS IN OBESE AND NON OBESE PATIENTS ADMITTED AT INTENSIVE CARE UNIT (ICU)

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INTRODUCTION. Obesity has been pointed out as an independent risk factor for morbity and mortality at ICU.

METHODS. Retrospective review of peritonitis cases admitted at ICU. Patients were divided into two groups regarding BMI: 1) super obese (SO) with patient on BMI above 35 kg/m2 and 2) non obese (NO) those with BMI under 35 kg/m2.

RESULTS. 14 Patients were admitted with peritonitis (all of them admitted post surgery) from January 1st to December 31st 2005. The mean BMI on SO group was 50.55 kg/m2 ± 7.25 and on NO group was 25.33 kg/ m2 ± 5.02 (p< 0.001). Eight patients (57.14%) were admitted after complications due to gastroplasty reduction surgery and 42.85% (six patients) with peritonitis associated to other diagnosis. Females prevailed in both groups (71.43% in SO and 83.44% in NO). The mean age in SO group was 37.14 ± 10.20 yo and 67.0 ± 21.78 yo in NO group (p=0.01). The APACHE II index in the SO group was 8.57 ± 5.87 and in the NO group was 10.4 ± 5.22 (p = 0.613). Respiratory failure with invasive mechanical ventilation was present in all patients on NO group and in 62.5% of the SO group (5 in 8 cases). All of the cases on SO who required mechanical ventilation were tracheostomized, while 33.33% on NO group (2 in 6 cases) demanded it. All patients on NO group developed cardiovascular instability requiring vasoactive drugs, while on SO group 62.5% used it (5 in 8 patients). All patients on SO group received parenteral nutrition. Mean ICU time was 26.71 ± 12.89 days for SO group and 16.83 ± 8.28 for the NO group (p=0.07). There has been one death both in the SO group (14.28%) and in the NO group (16.66%).

CONCLUSION. Despite known risk associated to obesity, no differences on outcome was found in this small sample. These findings must point out caring of critical obese patient could be as successful as for a non obese one.

REFERENCE(S). Levi D. Critical care of the obese and bariatric surgical patient. Crit Care Clin. 2003 Jan;19(1):11-32.

0163

THE EFFECT OF CANCER ON OUTCOME FROM FAECAL PERITONITIS

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INTRODUCTION. Faecal peritonitis carries a high mortality. Anecdotally we had noticed that some patients with co-incident malignancy appeared to have a lower mortality. We decided to investigate whether this could be verified in our intensive care population.

METHODS. We carried out a retroprospective study analysing all patients who had been admitted to our intensive care unit (ICU) following surgery for faecal peritonitis. We compared those patients with known malignancy with those without. Mortality in the two groups was compared using Chi-square testing.

RESULTS. Sixty two patients were admitted to the ICU over 2 years. Eleven of these had underlying malignancy. Demographics are shown in the table.

TABLE 1.

	Malignancy group	Non-malignancy group
APACHE II Range (mean, median)	8-22(16.5, 18.5)	9-35 (16.9, 16)
Mortality prediction Range (mean, median)	14.3-60.2 (40.8, 43.5)	9.7-93 (37.9, 35)
Ventilation (days) Range (mean, median)	1-32 (8.3, 2)	0-42 (10.6, 7)
Circulatory support (days) Range (mean, median)	0-19 (5.7, 3)	0-32 (6.3, 5)
Renal support (days) Range (mean, medain)	2-5 (3.5, 3.5)	1-21 (7.2, 4)
ICU length of stay (days) Range (mean, medain)	1.3-50.1 (12.3, 5.2)	0.3-48.3 (13.3, 10.1)
Mortality (%)	2 (18%)	20 (39%)

CONCLUSION. The ICU mortality for the non-malignant group was over twice that for the malignant group, although statistically this was non-significant. We feel that there is enough difference between the two groups to warrant further investigation and we plan to carry out a prospective study to look more closely at these patients.

0164

EXAMINATION OF POSTOPERATIVE MORTALITY IN TUMOUR PATIENTS AFTER OESOPHAGECTOMY

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INTRODUCTION. Oesophagectomy in patients with cancer has high mortality. It can be due to extensive surgical intervention, serious malnutrition or chemoneoadjuvant therapy. We examined the relation of postoperative inflammatory response and mortality in patients who underwent oesophagectomy.

METHODS. We examined 35 patients in a retrospective clinical study. Patients in the first group (group 1, n=30) survived, patients in the second group (group 2, n=5) died after the intervention. We measured the level of C-reactive protein (CRP), procalcitonin (PCT), tumour necrosis factor-alpha (TNF-α), interleukin-6 (IL-6), interleukin-8 (IL-8) before (t_0), immediately after (t_1), on the first, second (t_2, t_3) and seventh day (t_7) following the operation. Organ dysfunction was evaluated using the scoring system of Marshall et al. Statistical analysis was made with SPSS and Mann-Whitney U-test. Data are shown as mean and standard deviation.

RESULTS. Significantly higher IL-6 levels were measured on the first, second and seventh day after the operation in group 2 (t_2: 160.4 ± 85.3 vs. 486.6 ± 316.3 ng mL^{-1}, p=0.039, t_3: 108.7 ± 55.6 vs. 221.3 ± 33.5 ng mL^{-1}, p=0.04, t_7: 99.7 ± 131.4 vs. 212.3 ± 82.7 ng mL^{-1}, p=0.027). No statistically significant differences were found among the other inflammatory parameters. Examining organ dysfunction, the Horowitz-index was significantly lower in group 2 on the fourth day (t_4: 209.5 ± 92.5 vs. 106.5 ± 2.1 p=0.04).

CONCLUSION. Among the examined inflammatory parameters, the level of IL-6 was significantly higher in group 2 on the first, second and seventh postoperative days. This was the only parameter which might be a predictive factor of mortality in oesophagectomy patients.

REFERENCE(S). Bollschweiler E et al: Preoperative risk analysis in patients with adenocarcinoma or squamous cell carcinoma of the oesophagus *British Journal of Surgery* 87: 1106-1110, 2000.

0165

EFFECTS OF PREOPERATIVE CHEMORADIOTHERAPY IN CANCER PATIENTS UNDERGOING OESOPHAGECTOMY

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INTRODUCTION. Few studies have dealt with the postoperative effects of chemoradiotherapy on patients with oesophageal tumour. We studied the effect of preoperative chemoradiotherapy on the postoperative inflammatory response and mortality in patients undergoing oesophagectomy.

METHODS. A retrospective clinical trial was carried out involving 57 patients after oesophagectomy. We divided the patients into two different groups. In group A (n=17), patients received chemoradiotherapy prior to surgery. In group B (n=38), chemoradiotherapy was not applied. Physiological parameters documented preoperatively (t0), immediately after surgery (t1) and two days following surgery (t2, t3) were collected. Parameters included total plasma protein, C-reactive protein, prealbumin, albumin, procalcitonin, tumour necrosis factor-alpha (TNF-α), interleukin (IL-6, IL-8), alpha -1 glycoprotein and fibrinogen levels. Multiple Organ Dysfunction Scores (MODS) by Marshall et al were also retrieved. Statistical analysis was carried out using statistical program for social sciences (SPSS), Mann-Whitney U test and Chi-square test. A statistical significance of $p<0.05$ was considered and data were expressed as mean ± standard deviation.

RESULTS. Group A presented significantly higher total plasma protein levels than Group B (t0: 67.7±5.7 vs. 58.8±7.6 g/l, respectively, p=0.023; t2: 52.2±6.5 g/l vs. 45.3±3.6 g/l, respectively, p=0.032). There were no intergroup significant differences in MODS and other biochemical parameters. Hospital mortality did not show statistically significant differences either.

CONCLUSION. According to our measurements, chemoradiotherapy does not affect postoperative inflammatory response, MODS and mortality.

REFERENCE(S). Hagry O et al: Effects of preoperative chemoradiotherapy on postsurgical morbidity and mortality in cT3-4 +/- cM1lymph cancer of the oesophagus and gastro-oesophageal junction. Eur J Cardiothorac Surg. 2003 24:179-86.

0166

COMPARISON OF INFLAMMATORY RESPONSE AFTER OESOPHAGECTOMY AND EXTENSIVE ABDOMINAL SURGERY

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INTRODUCTION. Thoracotomy, laparotomy, collar mediastinotomy in oesophageal cancer patients are associated with high operative stress. It can be due to extensive tissue damage, long duration of surgery or severe blood loss. We compared the postoperative inflammatory response of oesophagectomy associated with high mortality and morbidity to other extensive abdominal operations.

METHODS. 48 patients were examined in a prospective clinical study. Patients in the first group underwent oesophagectomy (group 1, n=22), in the second group had other extensive abdominal procedures (group 2, n=26). We measured the level of C-reactive protein (CRP), procalcitonin (PCT), tumour necrosis factor-alpha (TNF-α), fibrinogen, albumin, prealbumin, transferrin, interleukin-8 (IL-8) and alpha-1 glycoprotein before (t_0), immediately after (t_1) and on the first and second (t_2, t_3) day following the operation. Statistical analysis was made with SPSS and Mann-Whitney U-test. Data are shown as median and standard deviation.

RESULTS. Postoperative mortality in group 1 and group 2 were 13.6% and 1.5%, respectively. Significantly higher PCT levels were measured after surgery and on the first postoperative day in group 1 (t_1: 1.67 ± 1.78 vs. 0.69 ± 1.2 ng mL^{-1}, p=0.027, t_2: 1.48 ± 1.3 vs. 0.57 ± 1.16 ng mL^{-1}, p=0.045). Albumin levels were significantly higher preoperatively and lower on the first postoperative day in group 1. Albumin levels showed decreasing tendency in both groups (t_0: 36.2 ± 4.19 vs. 33.3 ± 3.75 mg L^{-1} p=0.022, t_2: 26.5 ± 4.52 vs. 29.8 ± 4.46 mg $^{-1}$ p=0.022). No statistically significant differences were found among the other biochemical parameters.

CONCLUSION. Superior inflammatory response due to major operative stress and longer duration of the surgery could not be shown by evaluating the levels of the examined biochemical parameters. No parameter was found to be a predictive factor of mortality.

REFERENCE(S). Tashiro T, Yamamori H, Takagi K et al: Changes in immune function following surgery for esophageal carcinoma. Nutrition 15: 760-766, 1999.

0167

RED CELL PACK USE AND MORTALITY RATE IN BRAZILIAN SEPTIC PATIENTS – SEPSIS BRAZIL STUDY

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INTRODUCTION. Anemia in the seting of critical illness is quite prevalent, with 37 – 44% of patients receiving at least one blood transfusion during their intensive care unit (ICU) stay [1,2]. In one representative study [3], 85% of patients with an ICU length of stay greater than 1 week received at least one blood transfusion. In more than two thirds of these cases blood transfusion was not associated with acute blood loss. The study objective is to compare packed red blood cell (RBC) transfusion in septic patients and mortality rate in septic patients.

METHODS. We conducted a prospective cohort study in 65 hospitals of all regions of Brazil. The patients who were admitted or who developed sepsis during september 2003 were enrolled. They were followed until the 28th day. Sepsis diagnosis was made in accordance to the criteria proposed by ACCP/SCCM in 1992. We evaluated demographic features, APACHE II, SOFA score, mortality, sources of infections, microbiology and interventions. We also recorded underlying diseases and lengh of stay. We accepted $p<0.05$ as significance level and used $\chi 2$ test for statistical analysis.

RESULTS. 3128 patients were identified and 526 (16.8%) filled the criteria of sepsis, severe sepsis or septic shock. 233 patients (44.7%) received RBC transfusion and 288 did not (55.3%). Five patients were excluded (3 lost follow-up and 2 lack RBC transfusion registry). One hundred eighteen patients (50.6%) of the transfused group were dead in the 28th day; 115 (49.4%) were alive. One hundred twenty five patients (43.4%) of the non-transfused group were dead in the 28th day; 163 (56.6%) were alive. The mean APACHE II score in both groups was 20 + 8, (expected mortality rate of 40%). The mean age was 61.6 + 18.8 years in the tranfused group and 61.7 + 18.7 in the non-transfused group. We found no statistical difference between the two groups (p=0.09).

CONCLUSION. RBC transfusion made no difference in 28th day mortality.

REFERENCE(S). 1. Vincent J L, Baron J-F, Reinhart K, Gattinoni L, Thijs L, Webb A, Meier-Hellmann A, Nollet G, Peres-Bota D:Anemia and blood transfusion in critically ill patients. JAMA 2002,288:1499-1507.2. Corwin H L, Gettinger A, Pearl R G, Fink M P, Levy M M, Abraham E, MacIntyre N R, Shabot M, Duh M-S, Shapiro M J:The CRIT study:Anemia and blood transfusion in the critically ill:current clinical practice in the United States. Crit Care Med 2004,32:39-52.3. Corwin H L, Parsonnet K C, Gettinger A:RBC transfusion in the ICU. Is there a reason? Chest 1995,108:767-771.

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0169

TRIGGERING RECEPTOR EXPRESSED ON MYELOID CELLS – 1 (TREM-1) IS INCREASED IN HOSPITALISED PATIENTS WITH BACTERIAL RESPIRATORY TRACT INFECTION

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INTRODUCTION. TREM-1 is a recently described receptor expressed on neutrophils and monocytes. TREM-1 expression is stimulated after contact with bacterial and fungal cell products. Increased levels of the soluble form (sTREM-1) have been described in serum and bronchoalveolar lavage fluid (BALF) from patients with ventilator associated pneumonia. TREM-1 expression might also be a marker of bacterial respiratory tract infection in less severely ill patients.

METHODS. Forty patients admitted in a medical ward with pulmonary disease were enrolled in this study. Blood was drawn on the day of admission. TREM-1 neutrophil and monocyte expression were measured by flow cytometry (Epics XL-HCL, Beckman Coulter) after erythrocyte lysis and labelling with PE-conjugated anti-TREM-1 monoclonal antibodies. In addition clinical and laboratory data including temperature, blood gases, full blood count, CRP, sputum gram stain and culture, blood cultures and imaging data were collected. Clinical data were evaluated by two physicians blinded regarding TREM-1 expression and bacterial infection was diagnosed in the presence of a combination of fever, productive cough, sputum neutrophils, positive sputum culture, absence of a non-infectious condition fully explaining the patient's symptoms and a favourable response to antimicrobial treatment. TREM-1 expression was compared between the groups with and without bacterial infection by the Mann-Whitney test. Receiver operator characteristic (ROC) curve was drawn.

RESULTS. The mean age (range) of the patients was 66 years (22 – 88). Nineteen were diagnosed with bacterial respiratory tract infection and 21 with non-bacterial pulmonary disease. Median neutrophil TREM-1 percentage expression (+/- SE) was 9.34 +/- 6.22 in patients without bacterial infection and 78.26 +/- 7.11 in patients with bacterial infection ($p<0.001$). Repsective values of monocyte expression were 22.58+/-2.41 and 49.02 +/- 5.81(p 0.08). The area under the curve of the ROC was 0.85 ($p<0.001$). For a cut-off value of 59% the sensitivity, specificity and likelihood ratio of a positive test was 0.79, 0.83 and 4.73 respectively.

CONCLUSION. Neutrophil TREM-1 expression is a reliable marker of bacterial infection in patients with respiratory tract infections even if not in a critical condition and can be helpful in decisions regarding antimicrobial treatment or further diagnostic management.

0168

ERYTHROCYTE ALTERATIONS DURING STORAGE OF LEUKOCYTE-DEPLETED RED BLOOD CELLS

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INTRODUCTION. Blood storage has been reported to induce time-dependent changes in red blood cell (RBC) properties (shape, rheology and biochemistry), the so-called RBC storage lesion (1). Leukodepletion is used universally but the effects of this process on the RBC storage lesion have not been well studied. We investigated the time course of RBC storage lesion in human leukocyte-depleted RBC concentrates.

METHODS. Human leukocyte-depleted RBCs collected from seven healthy volunteers were stored in SAGM solution for 42 days. The hemogram was measured on days 1,3,7,14,21,28,35 and 42 of storage. RBC shape was estimated by a flow cytometry technique, using the measure of the second coefficient of dissymmetry of Pearson (PCD) With a value of zero, the PCD represents a perfect spherical shape (2). We measured intraerythrocytic 2,3-diphosphoglycerate (2,3-DPG) by colorimetric determination (Sigma Diagnostic®) and medium concentrations of total sialic acid (SA, Roche ®), the main carbohydrate of the RBC membrane. The results are expressed as mean ± SD and one way analysis of variance for repeated measurements (ANOVA) with Bonferoni post-hoc adjustments was used. Correlation was assessed by the Spearman test. A p value < 0.05 was considered as statistically significant.

RESULTS. RBCs were more spherical already after one week of blood storage (PCD: -0.60 ± 0.19 at day 7 vs -0.87 ± 0.06 at day 1, $p < 0.001$). After 2 weeks, the RBC count, hematocrit, hemoglobin levels and mean corpuscular hemoglobin concentration had all decreased. After 3 weeks, 2,3-DPG was undetectable. At day 35, total SA concentrations had increased and were correlated with the PCD suggesting RBC sphericity ($r^2 = 0.81$, $p < 0.001$).

CONCLUSION. Human leukocyte-depleted RBCs rapidly become morespherical during storage. A decreased 2,3-DPG content and a greater total SA concentrations in the medium suggest major biochemical changes during storage. Since the majority of transfused RBCs are stored for more than 2 weeks, these observations may have important clinical implications.

REFERENCE(S). (1). Chin-Yee I. et al. Transfus. Sci. 1997;18:447(2). Piagnerelli M. et al. Crit. Care Med. 2003;31:2156

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0170

DYNAMICS OF C-REACTIVE PROTEIN IN CRITICALLY ILL PATIENTS WITH NOSOCOMIAL BLOODSTREAM INFECTIONS

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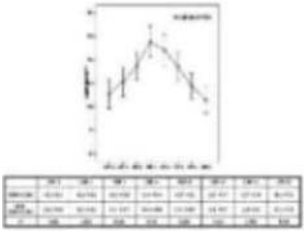
INTRODUCTION. Data about patterns of CRP in ICU patients with nosocomial BSI are sparse. We studied the dynamics of daily CRP levels to identify those patients with either good or worse outcome.

METHODS. A historical cohort study of all patients with a nosocomial BSI admitted to the ICU between 1 January 2003 to 31 December 2004. Comparison of CRP levels from two days prior to microbiological documented BSI (CRP-2) till five days after onset of BSI (CRP+5).

RESULTS. Over the study period, 155 patients were documented with a bacteraemia during their stay in the ICU. Mean age was 52.8±17.9 yrs. Fifteen days, 30 days, ICU, and hospital mortality rates were 17.4%, 26.5%, 29.7%, and 42.6%, respectively. Mean serum CRP concentrations from day -2 till day +5 were not significantly different in survivors (n=89) compared to non-survivors (n=66) (see Fig. 1). Although CRP levels are already high, 2 days prior to BSI, a smooth increase is seen from day -2 till day +1 (11.5±8.5 vs 16.4±9.1, P=0.38), from which on CRP levels will decrease till day +5 after onset of BSI. This distribution is, however, identical between both groups.



CONCLUSION. CRP has no value in predicting mortality in critically ill patients with nosocomial BSI.

0171

THE VALUE OF SYSTEMATIC COLONIZATION SURVEILLANCE IN ICU- A RETROSPECTIVE STUDY

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INTRODUCTION. Systematic colonization surveillance in the ICU permits monitoring of microbial transmission, early detection of epidemics and guidance for empiric antimicrobial treatment. We retrospectively studied the colonization dynamics of multi-drug resistant (MDR) pathogens in our ICU and analyzed the ability of colonization to predict microbial etiology of subsequent infections.

METHODS. The study was performed in a new 5-bed general ICU for 28 months. Infection control policy included weekly surveillance cultures of bronchial and stool samples. Colonization dynamics were studied in patients with at least two consequent surveillance cultures (ie 2 weeks in ICU). All cases of ventilator-associated pneumonias (VAP) and bloodstream infections (BSI) were recorded and relationship between infectious etiology and most recent colonization was analyzed, based on species, antimicrobial susceptibility and molecular typing by REP-PCR of selected isolates.

RESULTS. A. Colonization dynamics analysis: Of 66 patients, 23 (35%) were colonized by at least one MDR pathogen on admission. For the rest, the most common colonizing microorganism was A.baumannii (78%), in an almost endemic presence. MDR P.aeruginosa (57%) and K.pneumoniae (46%) behaved epidemically, usually following admission of an already colonized patient. Colonization occured early with A.baumannii (median, 11 and 12 days, for RT and GT), later for P.aeruginosa (20 and 11.5 days) and even later for K.pneumoniae (19.5 and 24 days). B. Colonization-infection concordance analysis: Among 266 patients, 21 VAP and 74 BSI cases (41 catheter-related) were recorded. Pathogens isolated from VAP cases correlated with bronchial or stool colonizers in 83%, with prior RT colonization being most important. In both primary BSI and CR-BSI cases, Gram-negative pathogens were recent colonizers in 73% and 81%, respectively, associated with both GT and RT. REP-PCR techniques confirmed pathogen and colonizer concordance in all cases tested. Systematic colonization surveillance permitted 90% adequacy in VAP and 80% in primary bacteremia empiric antimicrobial treatment.

CONCLUSION. RT and GT colonization is strongly related to microbial etiology of subsequent infection and systematic surveillance could be helpful in implementing adequate antimicrobial therapy in the ICU.

0172

CORRELATION BETWEEN TWO FORMS OF PROCALCITONIN MEASURED IN ICU PATIENTS

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INTRODUCTION. Elevation of serum procalcitonin (PCT) has been proposed as a marker of disease severity associated with sistemic infection. There are two methods: quantitative (PCTL) and semiquantitative (PCTQ). We intend to evaluate the correlation between the two methods.

METHODS. We evaluate 222 blood samples from 83 patients with SIRS or sepsis in the ICU. PCTQ levels wee availed in four levels and compared with PCTL levels.

RESULTS. The analysis found a positive correlation between PCTQ and PCTL for levels > 2ng/dl and > 10 ng/dl. The sensitivity and specificity were 50% and 91% respectively.

CONCLUSION. The preliminary analysis suggests that PCTQ can be used to measure PCT level in values above 2ng/dl. Levels below that need more samples to provide more information.

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0173

OPTIMALIZATION OF ANTIBIOTIC USE GUIDED BY PROCALCITONIN IN PATIENTS UNDERWENT OPEN HEART SURGERY

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INTRODUCTION. Procalcitonin (PCT) is thyroid gland prohormone, and its serum concentration is elevated in bacterial infections. The prognostic value of elevated serum levels of PCT in patients early after cardiac surgery on cardiopulmonary bypass (CPB) remains unclear. In RCT study, we investigated whether PCT is useful as prognostic marker in cardiac surgery, with respect to mortality, complications and infections, and whether procalcitonin-guidance could reduce antibiotic use in patients subjected to the open heart surgery.

METHODS. 205 patients subjected to surgical CABG, valve replacement or combined CABG + valve operations were randomly assigned for procalcitonin-guided treatment (procalcitonin group; n=102) or standard care (control group; n=103) from 02/05 till 08/05. On the basis of serum PCT concentrations, use of antibiotics was encouraged ($\geq$ 0.5 ng/mL) or discouraged. Reevaluation was possible after 6-24-48 hours in both groups. Primary endpoint was use of antibiotics and analysis was by intention to treat. Operation data, laboratory data and clinical outcome: mortality, infections, severe complications were observed.

RESULTS. In the PCT-group, the ICU stay was 5.74$\pm$11.49 days and in control group 6.97$\pm$11.61 (p=0.0447). Hospital stay was 12.08$\pm$11.28 v 12.93$\pm$10.73 (p>0.05) days, respectively. Clinical and laboratory outcome was similar in both groups and favorable in 188 (92.6%). Mortality ratio was 7/95 in experimental and 8/95 (p=0.8038) in control group. We have found that complications occurred in 40/62 v 41/62 (p=0.4837) while infections appeared in 5/97 v 22/81 (0.0082) cases. The relative risk of antibiotic exposure was in control group compared with the PCT-group 3,81 (95% CI 2.03-7.17; p<0.00001). Substantial difference we observed in treatment of urinary infections between PCT and control group: 1/101 v 9/94 (p=0.0330). Considering the type of cardiac surgery the antibiotic use was significantly reduced in all diagnostic subgroups.

CONCLUSION. We have found that PCT-guided antibiotic treatment is safe and can significantly reduce the cost of postoperative care. Additionally, the antibiotic use during immediate postoperative course should be timely controlled and limited on documented bacterial infections.

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0174

BRONCHOALVEOLAR LAVAGE IN CRITICALLY ILL PATIENTS WITH SUSPECTED PNEUMONIA

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INTRODUCTION. Pneumonia in patients in intensive care units (ICU) is a common infection that results in high morbidity and mortality.

METHODS. OBJECTIVE: To describe etiology agents, the antibiotic use and the clinical outcome of pneumonia patients who require mechanical ventilation.
96 consecutive mechanically ventilated patients with suspected pneumonia and BAL recruited between november 2003 and march 2006 were registered. ICU length of stay, time on mechanical ventilation, mortality, isolated bacteria, and antimicrobial susceptibility were collected.

RESULTS. A total of 96 cases of suspected pneumonia were recruited, including 12 (13%) cases of community associated pneumonia (CAP), 26 (27%) cases of early-onset ventilator-associated pneumonia (VAP < 5 days),43 (44.8%) cases of late-onset ventilator-associated pneumonia (VAP $\geq$ 5 days) and 15(15.6%) cases of inmunocompromissed patients. More of the patients (77.1%) received antibiotics before performing BAL.
BAL was positive (> 10000 ufc/ml) in 41.7% of patients: 16.7%, 63%, 39.5% and 33.3% of CAP, early-onset VAP, late-onset VAP and inmunocompromissed patients respectively.
ICU length of stay was significantly longer for patients with CAP and late-onset VAP than for early-onset VAP patients.
Mortality was 33.3%, 25.9%, 23.3% and 73.3% to CAP, early-onset VAP, late-onset VAP and inmunocompromissed patients respectively.
CAP and early onset VAP were mostly caused by antibiotic sensitive bacteria, while late-onset VAP were caused more frequently by multiple pathogens with an inadequate prior antibiotic treatment.

CONCLUSION. 1.- The low incidence of positive BAL in the CAP group underwrites the use of BAL only for particularly severe, selected cases.
2.- Although there was difference in the isolated bacteria and antibiotic susceptibility among different kind of pneumonia, mortality was the same, except for inmunocompromissed patients.
3.- Inadequate prior antibiotic therapy was more frequent in the late-onset VAP group.

0175

VALUE OF POST-INTUBATION TRACHEAL ASPIRATION FOR THE DIAGNOSIS OF NOSOCOMIAL PNEUMONIA

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INTRODUCTION. Nosocomial pneumonia (NP) is a common issue in the intensive care unit (ICU). An early and accurate diagnosis of NP is of utmost importance because of its potential impact on patients' outcome. The diagnosis of ventilator-associated pneumonia (VAP) relies on protected specimen brush (PSB), bronchoalveolar lavage (BAL), and plugged telescoping catheter (PTC) with quantitative cultures. In the particular setting of NP occurring in non-mechanically ventilated patients, there is no consensus regarding the best diagnostic strategy. When mechanical ventilation (MV) becomes mandatory because of NP-related respiratory distress, tracheal aspiration (TA) performed immediately after intubation of the trachea could be thought of as a simple, fast and cheap way to identify the microorganisms involved and achieve early adequate antibiotic therapy. The aim of the present study was to compare the diagnostic accuracy of post-intubation TA (PITA) to that of PSB, BAL or PTC in patients requiring MV for suspected NP.

METHODS. All consecutive patients with prior hospital stay >= 48 hours who required invasive MV for NP suspicion were prospectively enrolled. Immediately after intubation of the trachea, tracheal aspirates (PITA) were obtained by sterile suction. Within 2 hours, pulmonary samples were obtained either by PSB, BAL, or blinded PTC referred to hereafter as "reference methods" (RM). The thresholds for positive cultures were 10.3 cfu/ml for PTC and PSB, 10.4 cfu/ml for BAL, and 10.5 cfu/ml for PITA. The definite diagnosis of NP was based on a composite item of clinical, radiological and bacteriological (ie, blood or pleural fluid cultures) patterns. The agreement between PITA and RM was assessed by the kappa statistic. Sensitivity, specificity, positive likelihood ratio, and negative likelihood ratio of PITA and RM were calculated according to standard formulae, taking the definite diagnosis of NP as the reference.

RESULTS. Sixty-nine patients were included over a one-year period. The clinical suspicion of NP was confirmed in 44 cases (63.8%). The kappa statistic was 0.71. The sensitivity, specificity, positive likelihood ratio, and negative likelihood ratio were 77%, 84%, 4.80, and 0.27 for PITA, and 75%, 88%, 6.25, and 0.28 for RM, respectively.

CONCLUSION. PITA may be a reliable alternative to bronchoscopic samplings and blinded PTC in the particular setting of NP in newly mechanically ventilated patients.

0176

INFLAMMATION MARKERS AND CPIS IN SUSPECTED VENTILATOR ACQUIRED PNEUMONIA (VAP)

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INTRODUCTION. Ventilator-acquired pneumonia (VAP) bears a high morbi-mortality and is a complex diagnosis due to lack of accuracy of chest X-Ray and common infection markers. The clinnical pulmonary infection score (CPIS) has been proposed as an adjuntive tool for the management of VAP. The aim of the study was to assess the relation between CPIS, inflammatory response and bacterial isolates in suspected VAP.

METHODS. We included 32 ICU patients ventilated for more than 48h with new pulmonary infiltrates and suspected VAP and 12 ventilated controls without infiltrates. CPIS and systemic and local inflammatory response was assessed in plasma and BAL fluid at inclusion and after 3 days (TNF-alpha and soluble receptors, IL1b, IL6, IL8, IL10, CRP and procalcitonine). A standard microbiological work-up was carried out.

RESULTS. 17 patients had CPIS<6 (64+14yr; APSII:21+4) and 15 (53+14yr; APSII:20+7) had CPIS>6. CRP in serum was increased in patients with CPIS>6 compared with those with CPIS£6 and controls (11.2 vs 4.8: p=0.042). IL6 in BAL was aso higher in CPIS>6 (2783 vs 181: p=0.017). Senitivity and specificity of CPIS for microbiologically confirmed pneumonia was low (SE:50%; SP:48%). PCR was the only inflammatory marker associated with confirmed pneumonia (p=0.007). ICU mortality, days on the ventilator or length of ICU and hospital stay was not different between those patients with CPIS > 6 and CPIS £ 6. Days on mechanical ventilation, length of ICU stay and hospital stay did not differ between groups.

CONCLUSION. Ventilated patients with suspected VAP and CPIS>6 have an increased serum PCR and BAL IL6 compared to those with low likelihood of pneumonia and controls.

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0177

PROCALCITONIN AS A BIOLOGICAL MARKER OF VENTILATOR-ASSOCIATED PNEUMONIA

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INTRODUCTION. Ventilator-associated pneumonia (VAP) is the second leading type of nosocomial infection and is associated with high mortality. However, VAP diagnosis remain a difficult challenge. Procalcitonin is a biological marker of infection and it could have a role in VAP diagnosis.

METHODS. We conducted a prospective study of 44 patients receiving mechanical ventilation and without the coexistence of other infection than VAP. PCT and PCR were measured periodically in serum and bronchoalveolar lavage fluid. VAP was suspected if the patient fullfiled clinical criteria or CPIS was ≥5. VAP was diagnosed when a significant growth of quantitative cultures of bronchoalveolar lavage fluid was achieved. Systemic response was assesed by the presence of SIRS. Severity and organ failure were assesed by APACHE II, APS and SOFA scores.

RESULTS. VAP was suspected in 21 patients but only confirmed in 9 cases. Serum PCT was significantly increased in the VAP group. The best cutoff value was 2.99 ng/ml; sensitivity 77.8%, specificity 97.1%. The area under the receiver-operating-characteristic curve when PCT was used to differenciate the presence of VAP was 0.87. PCT was superior to serum PCR as a diagnostic tool for VAP. Alveolar PCT and PCR were similar in all groups. Serum PCT showed a poor correlation with the presence or not of SIRS and the results of APACHE II, APS and SOFA scores.

CONCLUSION. Serum, but not alveolar, PCT seems to be a helpful parameter for the diagnosis of VAP independently of the existence of SIRS or the severity of systemic repercussion.

0178

VALUE OF SEQUENTIAL MINI-BAL VERSUS ENDOTRAQUEAL ASPIRATION IN THE DIAGNOSIS OF VENTILATOR-ASSOCIATED PNEUMONIA

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INTRODUCTION. Controversy persists on which diagnostic respiratory samples should be used in the diagnosis of Ventilator-Associated pneumonia (VAP). We aimed to: 1) evaluate the utility of sequential quantitative cultures of respiratory samples obtained by blind mini-bronchoalveolar lavage (m-BAL) compared with endotracheal aspiration (EA) in the diagnosis of VAP and 2) to evaluate its safety.

METHODS. Prospective, observational study. We included patients under Mechanical Ventilation (MV) more than 48h. Serial respiratory samples for quantitative culture were obtained by m-BAL and EA, at 48-72 h of MV (baseline) and sequentially every 3-5 days (controls), while persisted ventilated. Protected distal aspiration was performed by a double Combicath catheter using 3 aliquots of 20 ml. Quantitative cultures ≥ 104 cfu/ml for m-BAL and ≥ 105 cfu/ml for EA were considered positives. Concordance between m-BAL and EA, with regard to the positivity of the samples, was assessed by Kappa coefficient.

RESULTS. 21 patients were included and 68 couples of samples (m-BAL / EA) obtained. Mean age 61±11 years; 14 (67%) males; APACHE II at admission 21 ± 8. Median of ICU stay was 20 days with 12 days of MV. 8 patients developed VAP (38%) and 7 (33%) died. Factors related to the development of VAP at the univariate analysis were: age; duration of ICU stay and MV; hypotension and levels of C-reactive protein. M-BAL showed more number of positive results at controls 1 and 3, otherwise the degree of concordance was higher at baseline and control 2 (Table). Microbiological isolations were similar with both techniques. We had a low rate of complications with 6 episodes of transient desaturation.

TABLE 1.

	Baseline	Control 1	Control 2	Control 3	Control 4	Control 5
Samples: n	21	21	12	8	4	2
EA - /m-BAL+	2 (9%)	5 (24%)	0	3 (37%)	2 (50%)	0
Concordant	19 (90%)	15 (71%)	11 (91%)	5 (63%)	2 (50%)	2 (100%)
k coefficient	0.74	0.12	0.75	0.25	no statics	no statics

CONCLUSION. 1) m-BAL and EA showed similar results, but m-BAL presented more positives microbiological isolations at controls 1st and 3rd (6th y 12th day of MV). We could not find any difference with regard to their value in the diagnosis of VAP, however these are preliminary results with low number of cases. 2) m-BAL is a safety procedure.

0179

DIRECTED DIAGNOSIS TECHNIQUES FOR ETIOLOGIC IDENTIFICATION OF SEVERE COMMUNITY-ACDQUIRED PNEUMONIA

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INTRODUCTION. Severe community-acquired pneumonia (CAP) is associated with an important morbidity and if the antibiotic treatment is inadequate increases mortality. The purpose of our study was to analyze patients with severe community-acquired pneumonia, identify the etiologic agent with systematic and directed diagnosis techniques and to compare our results with a multicenter study [1].

METHODS. Prospective study including all patients with CAP admitted to the Intensive Care Unit between March-2002 and December-2005. Data collected included demography, risk factors, radiograph, diagnostic techniques, etiology, antibiotics and mortality. Etiologic diagnosis was performed with tracheal aspirate, bronchoalveolar mini-lavage fluid, blood samples, culture for Legionella, urinary antigens, and a new diagnostic technique: Polymerase Chain Reaction (PCR) for Legionella [2].

RESULTS. We studied 140 patients. Mean age (±SD) was 56.8±15.4 years and SAPS II was 39.5±17.3. More frequent risk factors were smoking (57.1%), alcohol abuse (35%), COPD (43.6%) and cardiomyopathy (22.7%). Etiological diagnosis in our study was established in 72.9% of the patients, as compared with the 52.2% found in the multicenter study. More frequent pathogens were S. pneumoniae (30%) and Legionella (22.9%). In our study the isolation of Legionella was higher than in the multicenter study (22.7% versus 7.7%). Mortality rate was 27.1%. Elderly patients and higher severity score at ICU admission were associated with a significant increase in mortality ($p<0.001$). Other risk factors affecting overall mortality were: cardiomyopathy, mechanical ventilation, rapid radiographic spread, renal failure, positive blood culture, shock and ARDS ($p<0.05$).

CONCLUSION. 1) Systematic research of causal agents in patients with severe CAP is important to get an etiologic diagnosis of CAP and favour an adequate antibiotic treatment; 2) New advances in diagnostic techniques, such as PCR sequencing, increase etiological diagnosis of Legionella, still underestimated.

REFERENCE(S). 1. Bodi M, et al. Antibiotic prescription for community-acquired pneumonia in the intensive care unit: impact of adherence to Infectious Diseases Society of America guidelines on survival. Clinical Infectious Diseases 2005; 41:1709-16; 2. Cloud J L, et al. Detection of Legionella species in respiratory specimens using PCR with sequencing confirmation. Journal of Clinical Microbiology 2000; 38:1709-1712.

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0180

PERFORMANCE OF MEDS SCORE AND 2001 ATS CRITERIA FOR COMMUNITY-ACQUIRED PNEUMONIA REQUIRING ICU CARE

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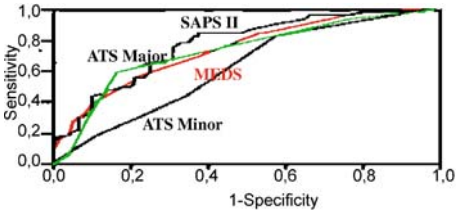
INTRODUCTION. The MEDS score is validated in the emergency room (ER) pts suspect of infection. The 2001 ATS criteria define severe CAP and criteria for ICU admission. We compared their accuracy for predicting mortality among a cohort of severe CAP requiring ICU.

METHODS. All pts admitted from the ER with severe CAP during a 30 months period were prospectively enrolled. Calculation of the MEDS score, the number of minor (Cminor) and major (Cmajor) 2001 ATS criteria, the SAPSII score. ROC curve analysis and Odds Ratios (OR) were used to evaluate the scores' accuracy.

RESULTS. For the 141pts:median and interquartile of MEDS score, Cminor and Cmajor 10 (8-13),3 (2-4) and 2 (1-3). Median values for age and SAPSII were:69.2 yrs (52.7-79.7) and 53 (36-73.5). Hospital mortality rate:36.1%. Both models discriminate well between survivors and nonsurvivors (MEDS:9.7±3.4 vs13±4; Cminor:2.6±1.4 vs 3.2±1.2; Cmajor:1.5±1.3 vs 2.6 ±1.3; SAPSII:47.8±19.9 vs 69± 23.5; p <.01). The area under the ROC curve for MEDS score was:0.735 (95%CI,0.65-0.82), for Cmajor: 0.726 (95%CI,0.637-0.814), and for SAPSII: 0.767 (95%CI,0.687-0.847). CAP with a MEDS score >10 in the ED had fourfold risk of dying (OR:4.7, 95%CI,1.99-11.12).



CONCLUSION. The operational performance of the MEDS score and that of Cmajor 2001 ATS criteria are similar for predicting mortality in CAP requiring ICU. A MEDS score>10 seems to be discriminant.

0181

A VENTILATOR-ASSOCIATED PNEUMONIA RISK SCORE – CONSTRUCTION ET VALIDATION

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INTRODUCTION. Ventilator-associated pneumonia (VAP) is frequent and associated with a significant morbidity and mortality. It could serve as an outcome measurement of quality of care in ICUs. However, it could a benchmark tool only if case-mix issues are taken into account.
Aim: To build and validate a ventilator-associated risk score as a tool to measure performance in ICUs.

METHODS. 1856 patients ventilated for more than 48 h of the OUTCOMEREA database were included. 1233 were randomly allocated to a training dataset and the remaining 623 patients to a validation dataset. Patient-based and ICU-based variables associated with the VAP occurrence, as well as the duration of mechanical ventilation (MV) were introduced in a multivariate logistic model. Calibration of the final model was assessed in both training and validation dataset using Hosmer Lemeshow chi-square test and ROC curves.

RESULTS. 18 variables were tested. Duration of MV, was divided in 4 classes. At the last step of the multivariate model, risk factors for VAP were male sex (OR 95%IC =2.10 [1.42; 3.12]), diabetes (1.69 [1.07; 2.67]), use in the first 48 hours of ICU stay of: arterial catheter (1.61 [1.09; 2.37]), absence of parenteral nutrition (1.89 [1.24; 2.87]), absence of large spectrum antimicrobials (2.25 [1.56; 3.25]), accidental extubation (5.22 [1.34; 20.25]), duration of MV: 5 à 7 days (17.55 [4.01; 76.85]), 7 à 15 days (53.01 [12.74; 220.56]), more than 15 days (225.6 [54.3; 936.7]). One ICU-based variable was significant: the mean % of antibiotic free days (OR : 0.05 [0.007; 0.38]). Fit (Chi2=7.48, df=8 et p=0.49) and discrimination (AUC ROC=0.866) were good on the training set. Discrimination remained good (AUC-ROC:0.783) in the validation set. The observed incidence density by ICU was between 9.7 and 26.1 /1000 VM days but the ratio between predicted and observed incidence density was not different from 1 in all but 1 ICU.

CONCLUSION. If VAP is used as an outcome measure, the VAP risk score might be a more acurate benchmark tool. An external validation of the score is needed.

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0182

DIAGNOSTIC ACCURACY OF CPIS IN PATIENTS WITH VENTILATOR-ASSOCIATED PNEUMONIA

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INTRODUCTION. The ventilator-associated pneumonia (VAP) is an important infection in ICU. The early diagnosis improves the chance of survival with the correct treatment in the adequate time. The aim of this study was to analyze the diagnostic accuracy of clinical pulmonary infection score (CPIS) in patients with VAP.

METHODS. We evaluated 30 clinical suspicion of VAP during 5 months, in 25 patients admitted in a general ICU. When the senior physicians of the ICU had the VAP's suspicion, CPIS was calculated at day zero and day 3. All these suspicions had bronchoscopic bronchoalveolar lavage (BAL). We considered a CPIS $\geq$ 6 like a positive indicator of VAP in both evaluations in days 0 and 3, while a positive BAL was considered when we met at least one bacterial species $\geq$ 104 cfu/ml from BAL fluid.

RESULTS. In the 30 clinical suspicions, we had 25 positive BAL. In this group, we had 17 positive CPIS, while in the 5 negative BAL we had only one. The construction of a 2 x 2 table with columns to positive and negative BAL, and rows to positive CPIS present and absent, gave us a sensitivity of 0.68 and a specificity of 0.80. The positive likelihood ratio of a positive CPIS was 3.4, while the negative likelihood ratio was 0.4.

TABLE 1.
Correlation of CPIS and BAL

	Positive BAL	Negative BAL
Positive CPIS	17	1
Negative CPIS	8	4

CONCLUSION. Clinical suspicion of VAP with positive BAL are 3.4 times more likely to have CPIS $\geq$ 6 in days zero and 3, than those with negative BAL, giving a good accuracy to this tool in the diagnostic process of VAP.

REFERENCE(S). Luyt C E et al. Value of the clinical pulmonary infection score for the identification and management of ventilator-associated pneumonia. Intensive Care Med 2004; 30: 844 – 852.
Chastre J, Fagon J Y. Ventilator-associated pneumonia. Am J Respir Crit Care Med 2002; 165: 867 – 903.

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0183

LOGISTIC REGRESSION ANALYSIS OF OUT-OF-HOSPITAL CARDIAC ARREST TO PREVENT THE FUTILE CPR EFFORT

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INTRODUCTION. It is hard to say that an appropriate CPR is always given for the emergency patients. When a patient passes away in Japan, members of his family are supposed to be with him, so even in the case of out-of-hospital cardiac arrest (OHCA) without witness, medical staffs are obliged to keep CPR until the family arrives, which would take more than 2 hours and causes the extra cost of medical service. The rule to discontinue ACLS is required and past OHCA cases were studied with statistical method.

METHODS. ACLS were performed routinely to all 129 patients in 2004 according to the AHA guideline. In this study the case with more than two hours recovered heart beat is considered successfully resuscitated, which were 44 patients, and the other 85 were unsuccessful. To predict the possibility of CPR, the logistic regression analysis was employed for the following simple data: sex, age, the supposed interval of cardiac arrest, the supposed cause and some emergency laboratory tests (totally 34 items).

RESULTS. To select the variables to be included in the logistic regression model, all the variables were examined using the Chi squared and t tests. Eight variables – body temperature (T), blood platelet (PLT), PT, PH, Log[NH3], Log[K], Log[LDH], and Log[PaO2] – were significantly related to the successful resuscitation ($P < 0.05$), in which Log denotes log transformation of the variables to produce Normality. Multiple logistic regression analysis with the backward stepwise approach yielded a model containing 4 significant variables, T, PLT, Log[NH3], and Log[PaO2]. The regression model to predict p, the probability of the successful resuscitation, is below and gave correct prediction of 80.6%.
L = logit (p) = 26.770 - 0.820T + 0.158PLT – 0.832Log[NH3] + 0.925Log[PaO2].

CONCLUSION. The accuracy of this model to predict the short-term outcome of OHCA which includes 4 variables, T, PLT, Log[NH3], and Log[PaO2] was 80% and could be clinically available. Blood ammonia level is considered a stopwatch to measure the interval of cardiac arrest because it is known to be proportional to the period of the circulatory collapse. The platelet is related to the coagulation function and could reflect the change by systemic damage. Using this model, the probability of successful CPR will be estimated and it will avoid the futile CPR effort.

0184

DETECTION OF DONORS USING A NEURO-INTENSIVE CARE PATIENTS' FOLLOW-UP PROTOCOL

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INTRODUCTION. In the year 2001, a follow-up protocol for neuro-intensive care patients was designed. The objective was to analyse their detection and outcome between 2001-2005, to define the donor profile, discover the time utilised in the process and suggest possible improvements.

METHODS. Prospective study of all patients admitted with GSC£ 8 in any critical unit of this 1200 beds University hospital. A patient archive was designed with: demographic and medical data, and times. Definitions:"first time":admittance-detection,"second time":detection-outcome; sub-divided in:diagnosis of brain death (BD), cardiac arrest, discharge in vegetative state (PVS) or in neurological improvement. SPSS.

RESULTS. 528 patients from all the intensive areas of the hospital were included. The mean age was 47(min.6months/max.87years). Characteristics of the sample are shown in table 1.15% of patients were rejected due to medical contraindications:35% because of neoplastic pathology, glioblastoma, prostate and lung are the most common. Infectious pathologies 19%, CVH/BVH 24%, VIH 4% and risk factors 11%. The results of times is displayed in table 2. Actual donors:mean age 45y, GCS=3:40%,3-6:43%The times are reduced to 1.45+/-2.2d and 3.8+/-5.5d.

TABLE 1.

GCS distribution and pathologies on admittance and aoutcome

	GCS=3	GCS>3<6	GCS>6<9
admitance	155(26%)	234 (44%)	136 (30%)
pathologies admittance: medical pathology	84	159	85
traumatical pathology	70	75	51
outcome: BD	37	89	79
cardiac arrest	42	85	60
PVS	8	10	4
discharge	89	96	29

TABLE 2.

times analysis

	Sample (n=528)	BD (n=205)	Cardiac-arrest (n=186)	PVS (n=22)	Discharged (n=217)
First time admitt-detection	1.99 +/- 5.4d	1.5+/-2.2*	2.64+/-8.2	3.9+/-9	1.5+/-2.1
Second time detect-outcome	11.5 +/-16.5d	3.46+/-8.7*	6.08 +/- 10.6	24.8+/- 18	19.7+/- 20

CONCLUSION. Our "typical donor" is a 45-year-old male, with a HIC and initial GCS 6, detected in the first 24-36h and whose donation takes place within the following 72h.

0185

HEMODYNAMIC MONITORING (PICCO SYSTEM) AND TROPONIN I IN SEVERE SUBARACHNOID HAEMORRHAGE

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INTRODUCTION. The single indicator transpulmonary thermodilution technique (PiCCO system) provides an assessment of cardiac output, cardiac contractile function (cardiac function index) and pulmonary oedema (extravascular lung water). We studied the frequency of these estimates using the PiCCO system in SAH patients. We also determined if elevated cardiac troponin I (cTnI) adversely affects these estimates of cardiopulmonary function.

METHODS. Twenty-eight patients with aneurysmal subarachnoid haemorrhage (SAH) with a poor clinical condition or large amounts of extravasated blood. We assessed reduced mean cardiac output (CI < 3 l/min/ m2), mean cardiac contractile function (CFI< 4.0 l/min) and elevated mean extravascular lung water (EVLWI > 10 ml/kg) every eight hours in the first 5 days after SAH.

RESULTS. A reduced cardiac output during at least one day, was seen in 6 (21%) patients, a depressed cardiac contractile function and an elevated extravascular lung water both in 10 (36%) patients. An elevated cTnI tended to increase the risk for reduced cardiac output (OR 6; 95%CI: 0.5 – 310) and was statistically significant related to decreased cardiac contractile function (OR 18; 95%CI:1.6 – 850).

CONCLUSION. Cardiopulmonary complications were frequently observed in patients with severe SAH. An elevated cTnI appeared to be a good marker for the occurrence of a decreased cardiac contractile function. Transpulmonary thermodilution technique seems to be a useful tool for monitoring SAH patients who are at risk of cardiopulmonary abnormalities, especially those with elevated cTnI on admission.

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0186

POLYURIA IN PATIENTS ADMITTED TO NEUROINTENSIVE CARE UNIT

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INTRODUCTION. Polyuria is very frequent in the neurointensive care unit. It can be caused by osmotic diuresis or water diuresis in central diabetes insipidus, both of which could lead to serum sodium dysbalance such as hyponatraemia or hypernatraemia. The aim of our study was to analyse diuresis over 4000 ml in patients admitted to the neurointensive care unit.

METHODS. We retrospectively evaluated 789 days of polyuria in 318 patients (mean age 68, from 17 to 82 years, 179 male, 139 female) out of 1605 patients hospitalised in the neurointensive care unit over a period of three years. There were 289 patients with diseases of the central nervous system (CNS), (cerebral 266 and extracecebral 23) and 29 patients with spinal diseases. 243 patients underwent operations. 168 patients received osmotic agents, 15 patients received diuretic agents and 16 patients were given a combination of osmotic and diuretic agents.

RESULTS. The mean value of all 789 polyuria was 4535 ml (from 4050 to 10400 ml). They lasted from 1 to 15 days (mean 2.5 ± 2.4 days). The mean value of the highest diuresis of each patient was 5192 ml. There were no significant differences in these diuresis either in patients with CNS or with spinal diseases (p=0.229); neither were there differences between those with cerebral and extracerebral diseases (p=0.933). No effect was found between patients who had operations and those who did not (p=0.969). Significant differences were found in diuresis in patients with cerebral complications (p=0.001), who also had significantly longer periods of diuresis (p<001). There were 680 days of polyuria in 261 patients (82%) without serum sodium dysbalance and 109 days of polyuria in 57 patients (18%) with serum sodium dysbalance. No significant differences were found in the mean values of diuresis between patients with and without serum sodium dysbalance (p=0.189).

CONCLUSION. The results of our study show that polyuria in neurointensive care unit is usually unaccompanied by serum sodium dysbalance for most patients. Due to the frequency of osmotherapy, the majority of polyuria were caused by osmotic diuresis.

0187

THE CHARACTER OF THE GASTROINTESTINAL PATHOLOGY IN NEUROSURGICAL PATIENTS

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INTRODUCTION. The aim of this study was to reveal the main types of the gastrointestinal disturbances that accompany CNS lesions. The study of relation between the type of GI pathology and the topography of CNS lesion was carried out.

METHODS. We have analyzed 180 neurosurgical cases in retrospect. The history of the gastrointestinal pathology within one year prior neurosurgery was the exclusion criteria.
The CNS pathology distribution: 68 pts with traumatic brain injury (TBI), 27 pts with fossa posterior tumors, 52 pts with tumors of chiasmal region, 33 pts with tumors of hemispheres and basal ganglia region.

RESULTS. The following main types of GI pathology were marked out.
1. Ulcerative lesions.
2. Erosions.
3. Case "1" and/or "2" accompanied by bleeding. It was verified that in case of the focal lesions of the diencephalon, brainstem and craniospinal regions the usual disposition of the erosion and ulcer is the pylorus and the bulb of the duodenum. The focal lesions of the hemispheres and basal ganglia regions commonly led to the evolution of the GI pathology in stomach curvatures. The 31% of patients with TBI had diffusive erosions of the mucous layer of the upper GI tract.

CONCLUSION. 1. The main types of the GI pathology in neurosurgical pts are the erosions and ulcers.
2. The location of the GI pathology is usually determined by the topography of the CNS lesion.

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0188

ACUTE VEGETATIVE STATE: ICU DATA

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INTRODUCTION. Vegetative state (VS) is generally considered as a late poor neurological condition. However vegetative state is a disorder of consciousness that can be acute and reversible. The aim of the present study was to provide a description of VS at the acute stage and to examine the outcome of these patients.

METHODS. We analysed data collected prospectively on all consecutive admissions over a 5 years period in a 26 beds intensive care units (ICU) at the Liege university hospital. During that period of time the best Glasgow Coma Score (GCS) was recorded daily. We defined patient with a GCS < 15 during the first 24-hour of ICU stay as having an impaired consciousness on admission. Among these patients VS was defined as: eye opening (spontaneously, to load voice or on noxious stimulation), no verbal response or incomprehensible sounds or groaning or not assessable/ventilated and no motor response or stereotyped response or normal flexion. We looked at ICU outcome and hospital survival separating traumatic from non-traumatic brain injuries.

RESULTS. Over the 5 years period, 5908 patients were admitted to the ICU. Among them 631 (11%) suffered from impaired consciousness on admission. During their ICU stay, 56% (n= 356) of ICU patients with impaired consciousness were or transit VS. Of the 356 VS patients 99 (28%) patients died in the ICU, 55 (15%) remained VS on discharge and 200 (56%) patients left the ICU in a conscious state. Among these 200 conscious patients, 118 were oriented and could obey command (59% of good outcome), 68 (34%) patients were confused or had inappropriate words and 14 (7%) only localised pain. Of the 356 VS patients there were 129 (36%) traumatic (TBI) and 227 (64%) non-traumatic (NTBI) brain injuries. On ICU discharge 90 (70%) of the TBI patients as compared to 82 (36%) of the NTBI patients were conscious (p<0.001). Hospital mortality was 19 (15%) in TBI and 110 (48%) in NTBI (p<0.0001).

CONCLUSION. Acute VS is far from being a rare diagnosis in the ICU. The prognosis of patients who were or transit through vegetative depends greatly on the nature of the brain injury. However even in non-traumatic brain injury, an important proportion of patients experienced favourable outcome. Therefore, great caution should be taken before considering end of life limitation in these patients.

0189

USING AN INTRAVASCULAR COOLING DEVICE TO REVERSE REFRACTORY BURN-ASSOCIATED HYPOTHERMIA

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INTRODUCTION. Hypothermia is a common occurrence in burn patients, especially when anaesthetized and mechanically ventilated. Unfortunately, the available therapeutic approaches for burn-associated hypothermia are limited, and extensive surface burns often limit the use of classic external and internal warming techniques. The use of novel intravascular cooling devices in order to warm hypothermic burn patients has not been evaluated.

METHODS. We used an intravascular catheter designed to lower the body temperature (Cool Line, Alsius Corporation, Irvine, CA, USA) in order to achieve the opposite: to warm a hypothermic burn victim. We treated a 28-year-old man who suffered a full-thickness skin burn involving 45% of his body surface area. He was sedated, mechanically ventilated, and admitted to the Intensive Care Unit due to co-existing inhalation burn. During admission he had moderate hypothermia with a rectal temperature of 30.8˚C, was hypotensive, had low urine output, and exhibited excessive bradycardia alternating with flairs of atrial fibrilation.

RESULTS. Despite active external re-warming using air-conditioning, a heating blanket, and warm crystalloid infusions, the patient remained hypothermic and in cardiovascular instability. We then employed the endovascular cooling device to combat hypothermia and maintain normothermia. This system circulates temperature-controlled sterile saline through two small balloons mounted on the distal end of the catheter. The patient's blood is gently warmed as it is passed over the balloons. The system had been set to a target temperature of 36.5˚C. The catheter-controlled re-warmig process took six hours, after which time the patient's core body temperature reached and was maintained at 36.5˚C. With normothermia, the patient's cardiac rhythm, urine output, and arterial blood pressure returned to normal.

CONCLUSION. Burn patients are extremely prone to hypothermia associated with hemodynamic instability and impaired perfusion. Intravascular warming can be considered as a possible alternative to classic methods of external or internal re-warming.

0190

THE EARLY VARIATION IN ACTIN-FREE GC-GLOBULIN IS ASSOCIATED WITH SEVERITY OF INJURY AFTER TRAUMA

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INTRODUCTION. Gc-globulin is a multifunctional plasma protein involved in the extracellular actin scavenger system responsible for the removal of circulating actin released from necrotic cells. No study so far, has described the time course of actin-free Gc-globulin concentrations in the first 24 h after injury. We hypothesized that low levels of actin-free Gc-glubulin were associated with severity of the injury.

METHODS. Two hundred consecutive adult trauma patients admitted a Level 1 trauma centre were included in this prospective study. All patients had plasma samples taken on admission and after 6, 12, and 24 h. The level of actin-free Gc-globulin was measured using the Gc-globulin (Actin-free) ELISA kit (AntibodyShop A/S, Gentofte, Denmark). Data were analyzed using ANOVA (mixed effect model, repeated measures) and the Bonferroni test. The local Ethics Committee approved the study.

RESULTS. Eighty patients (40%) had major injury (Injury Severity Score (ISS) > 15) with a significantly higher 30-day mortality than in patients with minor injury (ISS<=15) (27 (33.8%) vs. 1 (0.8%); p<0.0001, Fisher's exact test). The plasma concentration of Actin-free Gc-globulin was significantly lower in patients with major injury, table 1. This difference was present at all time points.

TABLE 1.
Actin-free Gc-globulin (mg/L) in trauma, ANOVA analysis, p<0.0001. (Mean (SE))

	ISS>15 (Major) (n=80)	ISS<=15 (Minor) (n=120)	P-value (Bonferroni)
Admission	208.0 (9.7)	259.4 (7.1)	0.0006
6 h	181.0 (9.5)	245.5 (7.0)	0.0006
12 h	182.6 (9.4)	239.1 (7.0)	0.0006
24 h	193.9 (9.2)	247.7 (11.0)	0.0024

CONCLUSION. Plasma concentration of actin-free Gc-globulin is reduced in trauma patients with major injury throughout the first 24 hours. The greatest difference in actin-free Gc-globulin between patients with minor and major injury is seen 6 h after admission. This finding supports the theory that measurement of actin-free Gc-globulin is a prognostic marker already on admission, and that it may be a useful marker in trauma assessment.

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0191

ELECTRIC CARDIOVERSION AND SEDATION: DO WE NEED ONLY SEDATIVE DRUGS?

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INTRODUCTION. Atrial fibrillation (AF) remains a common arrhythmia. Electrical cardioversion is commonly employed in its management. External cardioversion is a short but painful procedure with stimulus intensity analogous of a surgical incision. Adequate depths of sedation are important to prevent recall of an unpleasant experience and to attenuate the catecholamines surge of the stress response. We describe the use of different sedatives drugs, their side effects, and the presence of awareness and the quality of awakening of the anaesthesia.

METHODS. With approval of the ethics committee and written informed consent, 50 patients ASA II–III physical status, age 37-75 who were scheduled to undergo electrical cardioversion were enrolled twenty five per group in the study. Demographic data were comparable in both groups. Cardioversion was performed during a morning session on the CCU. Group 1 received initially 2.5 mg midazolam (MID) and 50 mcg fentanyl (FED) were given intravenously, there was a two minute wait before a further 1 mg MID and 50 mcg FED bolus were given and repeated at 1–2 minute intervals till the total dose of MID reached 5 mg. Group 2 received initially as a premedication 50 mg ranitidine, 10 mg metoclopramide, 4 mg ondansetron and then 2.5 mg MID, 50 mcg FED, there was a two minute wait before a further 50 mcg FED and 50 mg of propofol were given. The patients were considered effectively sedated when they appeared sleepy and no longer continued a conversation and there was no response to soft verbal commands and mild tactile stimuli, then the shock was performed.

RESULTS. Fisher's exact test was used for statistical analysis. P<0.05 was considered statistically significant. No patient required intubation in both groups. Patients needed respiratory support for a little while, were in group 1 one patient and for group 2 six patients needed respiratory support. Both groups received an adequate sedation. There was no difference between the groups regarding awareness and respiratory depression on the other hand there was statistically significant difference regarding nausea (P<0.05). The p-value for any of the events between the 2 groups is 0.538.

TABLE 1.

	Group 1	Group 2	P-values
Shocks remembered	4/25	0/25	0.11
Shocks unpleasant	1/25	0.25	1
Apnoea-respiratory problems	1/25	6/25	0.98
Nausea/vomiting	5/25	0/25	0.05

TABLE 2. Complications of cardioversion

	Group 1 (%)	Group 2 (%)
Shocks remembered	16	0
Shocks unpleasant	4	0
Apnoea-respiratory problems	4	24
Nausea/vomiting	20	0

CONCLUSION. We think that the use of medication such as H2receptors, 5HT3 are useful and also the sedation with the adjuvant of a classic sedative as propofol is a safe alternative and limits the side effects (as nausea) of the opioids.

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0192

RETENTION OF CARDIOPULMONARY RESUSCITATION KNOWLEDGE BY NURSES AND PHYSICIANS AFTER TRAINING

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INTRODUCTION. Victims of cardiac arrest need immediate cardiopulmonary resuscitation (CPR). The teaching of CPR is an important part of a continuing medical education program. In 1997, our 1400-bed tertiary teaching hospital introduced a 8-hr CPR plus automated external defibrillation training (BLSD course), targeted at nurses, physicians, healthcare students, and other allied healthcare professionals. A number of studies shows that learned CPR skills deteriorate over time even among nurses (N) and physicians (P). The purpose of this study was to investigate the retention of theoretical knowledge of CPR in our hospital trained N&P.

METHODS. Between January 2000 and June 2004, 122 BLSD courses with 1894 participants were evaluated. During this period, 996 N&P employed in our hospital have successfully completed the course and were included in the study. A total of 460 N(76%) and P(24%) were each fully interviewed with regards to their knowledge of CPR. 536 N&P were missed to the survey due to several causes (transfer to other hospitals, retirement, illness, pregnancy). The period of time since last trained in BLSD ranged from 6-48 months. Data were collected by a structured interview during a phone call.

RESULTS. More than 50% N&P who had been updated in BLSD up to 18 months prior to the interview were not able to answer correctly half the questions asked. Moreover, more than 50% N&P who had been updated in BLSD up to 12 months referred to feel no longer confident with practical CPR skills. No differences in CPR knowledge retention between N&P were found. On the contrary, a significant difference (p<.001) was shown between N&P employed in critical care areas or in ambulance staff and in not monitored wards. No difference related to gender was observed. Interestingly, 44% N&P referred to be directly involved in almost one in-hospital delivery of CPR following BLSD course participation. Moreover, 61% N&P undertook all four steps of the "chain of survival" (activation of the emergency medical team, CPR plus defibrillation, and advanced life support).

CONCLUSION. Data collected clearly show a time-dependent course in resuscitation content decay. Moreover, these data confirm that in-hospital cardiac arrest can occur anywhere. The results of this study underline the need for an in-hospital planned retraining program, as well as additional studies of the optimal timeframe for BLSD refresher course to facilitate N&P retention of CPR knowledge over time.

0193

LOW DOSE KETAMINE IN TREATING SHIVERING IN THE ICU

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INTRODUCTION. In a previous study, the author had evaluated the efficacy of low-dose ketamine (0.25mg/kg) in the treatment of intra-operative shivering associated with sub-arachnoid blockade. In the following study the author sought to evaluate the efficacy of low-dose (0.25mg/kg) ketamine in the treatment of post-operative (upto 72 hours) shivering in neurosurgical patients in a neuro intensive care unit.
Shivering would have deliterious effects in this setting & ketamine being a NMDA antagonist, would proably have neuro-protective effects.

METHODS. 60 post-operative neurosurgical patients having undergone craniotomy with a postoperative GCS > 10 were enrolled. All patients who shivered, during a 72 hour postoperative period received either low dose ketamine or pethidine (25 mg/60 kg) in a randomised fashion. Febrile episodes were treated with tepid sponging (< 100 F)& I/M paracetamol 500mg(>100 F). The time taken to cessation of shivering was noted in each group. Also, the respiratory rate, pulse, temperature, NIBP & SpO2 ware monitored in each group.

RESULTS. 61% of post-surgical patients had shivering. Low-dose ketamine completely abolished shhivering in.

CONCLUSION. Low dose ketamine is an effective choice for treating post-operative shhiveringg compared to pethidine. It also causes less respiratory depression & sedation compared to pethidine. Ketamine being a NMDA receptor antagonist could also have possble neuro-protective effects. No complications were noted in this study with the use of low dose ketamine.

0194

IMPACT OF HYPOTHALAMIC REGULATION ON HAEMODYNAMIC IN SEVERE SEPSIS

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INTRODUCTION. It is known that the outcome of sepsis depends on haemodynamic (H) stability, and we always try to support the hyperdynamic type of circulation especially in acute period. This study we planed to determine the role of central regulation (CR) of H on outcome in severe sepsis.

METHODS. 42 patients with severe sepsis were studied in ICU. Most of them had different signs of encephalopathy and were sedated. In our previous works we showed the influence of different regions of brain activity on variability of EEG amplitude and main haemodynamic parameters (HP). So, all patients with sepsis were examined by complex method of synchronic registration of EEG amplitude (AEEG) and HP, such as stroke volume (SV), cardiac output (CO), cardiac index (CI), heart rate (HR), blood pressure (BP), and pulsatory amplitude of peripheral vessels (PAPV). Besides we evaluate the variability (V) of all parameters in band 0-0.5 Hz and its four ranges - UVLF (0 – 0.05 Hz – metabolic influences), VLF (0, 05 – 0.075 Hz – hormonal activity), LF (0.075 – 0.15 Hz – baroregulation), HF (0.15 – 0.5 Hz – parasympathetic or volume regulation). The rise of V in AEEG and HP we estimated as the result of adaptive brain activity, the fall of V in all ranges – as the result of impairment of CR.

RESULTS. All patients were divided in two groups: A (CI >2.5) and B (CI < 2.5). In group A the patients had the high SV (75±5.4), CO (7.6±0.6) and BP (130.4±6.3); In group B these parameters were much lower: SV (27.6±2.5), CO (2.7±0.2), BP (113±5.5). In group B the amplitude of EEG was also lower (4.7±1.4), then in group A (8.3±0.5). The V in group A was high in UVLF and VLF for AEEG, PAPV and in LF, HF for SV, CO, BP, HR. More often it is the result of adaptive reaction and hypothalamic activity. In group B the V was very low in all ranges of AEEG and HP.

CONCLUSION. In patients with severe sepsis the adaptive hypothalamic activity supports the needful level of volume circulation. The fall of V of AEEG and HP may be used as a marker of poor prognosis.

0195

INTENSIVE CARE MANAGEMENT OF TRAUMATIC BRAIN INJURIED PATIENTS IN CATALONIAN REFERENCE ICUS

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INTRODUCTION. The Neurocritical Task Force of the Catalan Society of Intensive Care Medicine (SOCMIC) has a main objective to promote neurocritical research and discussion. With this aim, it was designed a research study to explore the clinical and management characteristics of TBI patients during their stay at the reference ICU, and review their clinical results. Additionally, these characteristics were contrasted with current clinical guidelines recommendations, and adherence to guidelines was evaluated.

METHODS. A prospective 1-year study was carried out, collecting epidemiological, clinical management and results data of 370 TBI patients that were admitted to 7 Catalan ICUs.

RESULTS. Male patients were predominant (3:1), with a mean age of 40. The severity profile (measured by GCS score) identified 53% severe, 27% moderate and 20% mild TBI patients. According to Marshall radiological classification of intracranial injury, type II diffuse injury (39%) was more prevalent. 49% of cases presented tHSA. Utilization of neuromonitoring devices was PIC 52% (69% in severe TBI), SjO2 27% (37% in severe TBI), TCD 50% (64% in severe TBI), cerebral perfusion pressure 59% in severe TBI. During the first 15 days of stay, a mean of 2 CT scan per patient were made. Therapeutic measures were also reviewed, and manitol appeared as the main osmotic measure for intracranial hypertension control. Corticosteroids were used in 15% of severe TBI patients. More than 25% of cases received vasoactive drugs support, predominantly noradrenaline. 25% of patients received prophylactic anticonvulsants. Barbiturates were prescribed in <10% of patients. Hyperventilation was used in 80% of patients. A neurosurgical intervention was practised in 24% of patients (21% in severe, 29% in moderate and 22% in mild TBI patients). The most prevalent secondary insult during ICU length of stay was fever and hypotension, specially in severe patients. Global mortality rate was 22% (32% in severe, 13% in moderate and 7% in mild TBI patients). Independent variables associated with a greater mortality were: female, >60 years old, admission GCS, anisocoria and bilateral mydriasis, encephalic type III/IV injury, evacuated or non-evacuated mass, Fisher type-III tHSA, and mean LOS <4 days or 5-12 days.

CONCLUSION. Clinical results profile and prognostic factors obtained were in accordance with current medical literature results. Although monitorization levels were greater than levels observed in published inquiries, there is little deviation from published clinical guidelines in the management of TBI patients in catalan ICUs.

Grant acknowledgement. Authors present this research in behalf of the Neurocritical Task Force of the SOCMIC.

0196

ANTITHROMBIN III SERUM LEVELS IN CEREBRAL ISCHEMIA

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INTRODUCTION. Stroke patients undergo alterations of the thrombotic and fibrinolytic systems with formation of thrombin antithrombin III complex (TAT) and consume of antithrombin III (ATIII). To evaluate the difference between focal and global ischemia we examined sequential changes in ATIII, TAT and coagulatory markers in ICU patients.

METHODS. 28 patients were included in this observational study (15 ischemic stroke-focal stroke-; 13 survivors after cardiac arrest–global stroke-). The plasma level of TAT, D-dimer, fibrin degradation products (FDP) and percent activity of ATIII were measured at the 1st and the 5th day after the stroke onset.

RESULTS. In all patients TAT was significantly elevated at all time points, and this elevated levels were associated with increased D-dimer and FDP levels. ATIII was not decreased in ischemic patients on the 1st and the 5th day after the stroke onset.

TABLE 1.

	ATIII (70-120%)	TAT (2–4 ng/ml)	D-dimer (<0.5 ng/ml)	FDP (<10 ng/ml)
Focal Stroke	91.5	17.6	10.8	52.5
Global Stroke	81.4	11.5	3.7	25

results at admission.

TABLE 2.

	ATIII (70-120%)	TAT (2-4 ng/ml)	D-dimer (<0.5 ng/ml)	FDP (<10 ng/ml)
Focal Stroke	92	11.5	10.1	15
Global Stroke	85.4	10.0	2.1	10

results at 5th day.

CONCLUSION. AT III is the most important physiological inhibitor of blood coagulation as it interferes with the clotting process at various levels; it might play an active role in the pathogenesis and in the evolution of cerebral ischemia. The present study demostrated the same alterations in thrombotic and fibrinolytic markers in each subtype of stroke.

REFERENCE(S). Piazza O. Gravino E, Annunziato L, Gily B. EJA, 2005, 22(5) S34

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0197

RENAL FAILURE OUTCOMES IN SEPTIC, LIVER TRANSPLANT AND PARACETAMOL OVERDOSE PATIENTS IN A UK ICU

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INTRODUCTION. Renal failure in the ICU is common but long term dialysis dependency is rare (1). One proposed mechanism is tubular failure through mitochondrial damage (2). Calcineurin inhibition (CI) has been shown to ameliorate mitochondrial structural damage caused by acute sepsis in an animal model (3) but is also associated with renal failure long term. We reviewed our rates of renal replacement therapy (RRT) following ICU discharge in 3 groups (sepsis, liver transplant [Tx] and paracetamol overdose [POD]) over a 20 month period. Liver Tx patients all received immunosuppression with CI. To our knowledge, rates of RRT following liver Tx have not been reported.

METHODS. We identified patients admitted to our ICU who survived to hospital discharge from Dec 03 to Aug 05. This was cross-correlated with the renal department database to identify those currently haemodialysed (HD) or on CAPD and the liver department database for Tx and POD patients. Previous renal impairment was defined as serum creatinine >.126mmol/L (the ULN in our hospital) within 6 months before admission.

RESULTS. 295 required RRT during their stay; 130 survived to hospital discharge. We excluded patients already receiving HD. There were no results for 9 patients. The study group size was 77; 46 were admitted with sepsis, 21 received Tx and 10 were treated for POD. In the septic group only 1 patient with previously normal renal function required RRT, compared with 4 septic patients with previous renal impairment. In the Tx group, 10 patients required temporary renal support following ICU discharge. However, of the 13 with pre-existing renal impairment, only 1 patient remains on RRT. None of the 8 with normal renal function required RRT. None of the POD group required RRT. Rates of recovery were similar in all groups (p=0.38, Fisher's exact). The median time to recovery was 8 days for the septic group and 15 days for the liver Tx group (p=0.07, t-test).

TABLE 1.

	Total No.	RRT with Crea<126	RRT with Crea>126	Renal recovery(median, days)
Septic	46	1 (2.17%)	4 (8.70%)	8
Liver	21	0	1 (4.76%)	15
POD	10	0	0	12

RRT requirement according to diagnosis (p=0.38, Fisher's Exact)

TABLE 2.

	Total No.	RRT	No RRT
Crea<126	22	1 (4.5%)	21 (95.5%)
Crea>126	46	5 (10.9%)	41 (89.1%)

Overall rates of recovery according to renal function (p=0.69, Chi squared)

CONCLUSION. Liver Tx RRT is uncommon. Rates are lower than sepsis in our study. We describe similar RRT requirements following sepsis to previous reports (1). We found no correlation between the use of CI and progression to RRT (p=0.38), although the time to renal recovery was longer. There was no association between previous renal impairment and RRT need (p=0.69), although numbers are small. This study serves as pilot data for future work.

REFERENCE(S). 1) Noble J S et al. Anaesthesia 2001 Feb;56(2):124-9 2) Schrier R W, Wang W. New Engl J Med. 2004 Jul 8;351(2):159-69 3) Crouser E D et al. Crit Care Med. 2002 Dec;30(12):2722-8.

0198

MORTALITY AND LENGTH OF HOSPITAL STAY IN PATIENTS THAT DEVELOP ACUTE RENAL FAILURE IN INTENSIVE CARE

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INTRODUCTION. Acute renal failure in critically ill patients carries a high mortality (40 - 70%) [1], traditionally attributed to severity of the underlying illness. However it has been suggested acute renal failure (ARF) *per se* carries an independent risk of dying, perhaps due to additional renal effects other than those of blood purification [1-3]. We conducted a prospective observational study to assess the impact of recovery of renal function on overall disease progression in our patient population.

METHODS. All patients admitted during a 15 month period to our mixed medical and surgical Intensive Care Unit (ICU) were analysed. Patients who developed ARF underwent haemodiafiltration with the Hospal Prisma System using AN69 membranes. Recovery of renal function was defined as those free from renal replacement therapy (RRT) on discharge from ICU. Those with pre-existing end stage renal failure were excluded. Mortality and length of hospital stay were compared between patients who recovered renal function and those who, on discharge from ICU, still required RRT.

RESULTS. Between August 2004 and November 2005 649 patients were admitted. 516 did not require RRT and 66 (13%) of these died. 133 (20%) developed ARF (median APACHE II score 25; mean age 64) requiring haemodiafiltration and 68 (51%) died in ICU. Of the 65 surviving patients with ARF, 56 (86%) recovered renal function, 11 (20%) of which died in hospital. Only 9 (14%) patients did not recover renal function, but 5 (56%) of these died. Mortality was significantly lower in patients who recovered renal function than in those who remained RRT dependent (Chi squared test, $p < 0.05$). There were no significant differences in median length of stay between these 2 groups (21 vs. 18 days, respectively).

CONCLUSION. In this population of high risk patients, a relatively small proportion developed ARF and these had a high mortality when compared with those who did not. In those that survived their ICU stay, most patients recovered renal function and these had a lower mortality than those still needing RRT beyond ICU. Our results suggest persistent renal failure, whilst not affecting length of stay, is associated with increased risk of death, and supports the concept of ARF as an independent predictor of mortality.

REFERENCE(S). 1) Metnitz P.G.H. et al. Critical Care Med. 2002;30:2051-2058. 2) Levy E.M. et al. JAMA. 1996;275(19):1489-1494. 3) Chertow G.M. et al. Am J Med.1998;104:343-348.

0199

ROLE OF N-ACETYLCYSTEINE IN PREVENTING RADIO CONTRAST-INDUCED NEPHROPATHY IN CRITICALLY ILL PATIENTS

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INTRODUCTION. Oral N-acetylcysteine (NAC) has been shown to reduce the incidence of acute renal dysfunction by 85% after iodinated contrast injection in patients at risk for contrast media nephropathy (1). The aim of this study was to assess the incidence of contrast media nephropathy in the ICU and evaluate the usefulness of NAC administration in its prevention.

METHODS. This study was a prospective cohort comparing the incidence of contrast nephropathy [increase in serum creatinine level>=0.5 mg/dl (44 μmol/l) or the need for dialysis within 48h] in two teaching hospital medical ICUs: in one oral NAC was always used while it was never used in the other; saline hydration and low osmolality contrast media were always used. All consecutive dialysis free patients needing iodinated contrast media for computed tomography or angiography with available serum creatinine before and within 48 h after examination were included. Risk factors for contrast nephropathy, severity scores, hemodynamics, hydration, volume of contrast media, serum creatinine and urea, urine output were prospectively recorded at contrast examination. Renal function parameters were recorded within 48h after examination.

RESULTS. 55 patients underwent 70 contrast examinations in the "no-NAC ICU" and 63 underwent 70 contrast examinations in the "NAC- ICU". Patients were similar in both ICUs for contrast nephropathy risk factors, severity, baseline renal function, hydration, and volume of contrast media administered. The incidence of contrast induced nephropathy was 17% (12/70) in the no-NAC ICU and 10% (7/70) in the NAC-ICU, p=0.21. The number of patient with a 25% increase in serum creatinine (18% vs 11%, p=0.23) or needing dialysis (6% vs 3%, p=0.98) within 48h were also similar.

CONCLUSION. The benefit of NAC in preventing nephropathy in the ICU, if any, was considerably smaller than previously reported. We could not demonstrate such a benefit.

REFERENCE(S). 1. Tepel M, et al. Prevention of radiographic-contrast-agent-induced reductions in renal function by acetylcysteine. N Engl J Med 2000;343:180-4.

0200

RENAL REPLACEMENT IN INTENSIVE CARE UNIT

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INTRODUCTION. Replacement of renal function in critical patients is complex. Continuous haemodialysis seems better than intermittent haemodialysis, but there are few studies that showed significant difference in this process in overall mortality. We will present our experience with Sustained Low Efficiency Dialysis (SLED), analyse tolerance and complications of this technique.

METHODS. A prospective study with collection of demographic and epidemiological data of all patients admitted to our intensive care unit (UCI) from January until December of 2005. We analysed all patients who needed renal replacement, focusing on the process of renal replacement therapy. It was used a conventional dialysis machine, using low blood and dialysate flow rate for prolonged time.

RESULTS. We analysed 135 SLED sessions in 17 patients (57.5±17 years; male: female, 11:6). Initial SAPS II and SOFA was 53.9±15 and 11.3±4 respectively. From all patients, 15 had medical illness, with 12 having sepsis. Six had chronic renal failure previous to admission and 2 were on regular dialysis. Thirteen patients were oliguric on admission and the mean initial creatitine was 3.1±1mg/dl and urea of 116.5±51mg/dl. The mean duration for each session was 9.9±2 hours and with a mean ultrafiltration of 2304±895ml. We used fraction LMWH in 81 sessions to prevent clotting. We had 7 interruptions, two for hemodynamic instability and five for blood clotting in the extracorporeal circuit. In 41 sessions patients were with amine infusion, with need of readjustment in 30 (19 session was necessary increasing dose). One patient recovered complete renal function, 3 patients maintain renal failure but without need for renal replacement therapy, other 3 needed regular renal replacement and 10 died while on ICU. The mean SOFA at discharge from ICU was 8.8±6.

CONCLUSION. This technique was well tolerated, with low rate of complications. The advantages are its simplicity, safety and low cost comparing with the continuous techniques. It must be considered a valid alternative in renal replacement therapy in critic patients.

REFERENCE(S). Schiffl H, Lang S M, Fischer R. Daily Hemodialysis and the outcome of acute renal failure. NEJM 2002;346:305-310.

0201

ACUTE KIDNEY INJURY DEFINED BY THE RIFLE CLASSIFICATION: WHICH BASELINE SERUM CREATININE LEVEL?

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INTRODUCTION. The RIFLE classification defines 3 grades of Acute Kidney Injury (AKI) on the basis of decreased urine output or increased serum creatinine level. Changes of serum creatinine level are measured by a proportional change from baseline level. This implicates that a normal daily life or baseline serum creatinine level is known. The aim of this study was to evaluate in what proportion of surgical ICU patients a pre-ICU serum creatinine level is known. In addition, we compared pre-ICU creatinine (Cr-before) as baseline to serum creatinine assessed immediately after ICU admission (Cr-adm).

METHODS. All patients admitted to the 28 bed adult surgical ICU of the Ghent University Hospital, during a 35 d period were prospectively evaluated. Patients were evaluated for occurrence of AKI on basis of a proportional increase increase of baseline creatinine levels (Cr-before, respectively Cr-adm) according to the RIFLE–GFR criteria.

RESULTS. 121 patients were admitted to the surgical ICU during the study period. Median age was 58 yr (interquartile range (IQR) 40, 70), and 63% were male. Median length of stay in the ICU was 3 d (IQR 2, 5), and ICU mortality was 8.3%. Cr-adm was assessed in all patients, Cr-before was available in 88 patients (73%) Cr-before and Cr-adm levels were comparable (Cr-before: median 0.86 mg/dL, interquartile range (IQR) (0.66, 1.07), range (0.24-4.36); Cr-adm: median 0.83 (IQR O.63-1.11), range (0.33-5.11); p=0.135). In patients who had both baseline values assessed, Cr-before was higher than Cr-adm in 52 patients (59.1%). When Cr-before was used as baseline for classification of patients, more patients were classified as AKI: 12.5% of patients developed RIFLE criteria when Cr-before was used, compared to only 6.6% when Cr-adm was used. Also severity of AKI was less when assessed on basis of a proportional increase of Cr-adm. Maximum RIFLE classes for Cr-before, respectively Cr-adm were Risk 3.4% vs. 5.8%, Injury 4.5% vs. 0.8%, and Failure 4.5% vs 0% of patients.

CONCLUSION. In almost two thirds of surgical ICU patients, serum creatinine level at admission was lower than the pre-ICU level. Sensitivity for detection of AKI was higher when a recent pre-ICU baseline serum creatinine level was used. However, in only 3/3 of patients a pre-ICU serum creatinine level was available.

0202

NO EXCESS RENAL FAILURE AFTER HIGH DOSE AMPHO-B BY CONTINUOUS INFUSION IN ICU PATIENTS

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INTRODUCTION. The aim of this study was to determine the course of renal function in relation to cumulative dose of Ampho-B administered by continuous infusion in ICU patients.

METHODS. In a 5-year retrospective cohort, data were extracted from the ICU database of all patients treated with a continuous infusion of Ampho-B in a cumulative dose of >200 mg. We compared patients who received 200-500 mg of Ampho-B ('low dose') to those who received more than 500 mg ('high dose'). Renal injury (RI) after Ampho-B was defined as a >150% increase in serum creatinin. Differences were calculated with the Mann-Whitney U test (for cumulative Ampho-B dose) and Fisher's exact test (for other variables).

RESULTS. Comparing the low and high dose groups, mean age (46 vs. 58 ys), percentage of surgical cases (37 vs. 31), APACHE II score (25 vs. 23), predicted (53 vs. 47%) and observed mortality (52 vs. 50%) were not significantly different. Need of hemofiltration (CVVH) before and after the start of Ampho-B were high, but not different between groups (Table).

TABLE 1.

	Low Dose (n=46), nr (%)	High Dose (n=16), nr (%)	p
CumAmBdose (median, IQR)	280 (244-341)	715 (574-806)	<0.001
CVVH at start AmB	22 (48)	8 (50)	1.0
CVVH after start AmB	7 (15)	3 (19)	0.74
RI after AmB, no CVVH	4 (9)	2 (13)	0.66
RI at death or disch.ICU	17 (37)	4 (25)	0.54
Hospital survival	22 (48)	8 (50)	0.88
RI at hospital discharge	2 (9)	1* (13)	0.79

*AmB= Amphotericin B Deoxycholate; * denotes need for dialysis*

CONCLUSION. In critically ill patients treated with Ampho-B by continuous infusion, mortality and need for CVVH are high. However, in two thirds CVVH is already initiated before the start of Ampho-B due to co-morbid disease. A cumulative dose of more than 500 mg by continuous infusion appears not to be associated with a higher incidence of renal insufficiency at discharge compared to the lower dose. Renal function recovered in nearly all survivors.

0203

EPIDEMIOLOGY, MANAGEMENT AND OUTCOME OF ACUTE RENAL FAILURE (ARF) IN ICUS IN GREECE

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INTRODUCTION. ARF is a common clinical entity in Intensive Care Units (ICUs). The incidence and mortality rates vary even in different hospitals in the same region. Aim of this study was to determine the epidemiology of ARF in ICU in our country; to characterize differences in etiology, management and outcome of ARF between different ICUs.

METHODS. Prospective multi-center study of ICU patients who presented with ARF from 15 September to 15 December 2005.

RESULTS. 22 units participated in the study. 170 patients (age: 66.9±15.5) presented with ARF (15% of total ICU admissions). The majority of these patients were male (67%) and 48% had normal renal function prior to ICU admission. The most common contributing factor to ARF was sepsis (48%). Renal replacement therapy (RRT) was required in 53.5% of the cohort. Peritoneal dialysis was not performed in any case. Continuous RRT was the most commonly performed modality (87%). ICU clinicians managed RRT in the vast majority of ICU patients (70.3%). ARF significantly increased ICU mortality (65% vs 15%, p<0.001). 15% of ARF survivors were discharged with renal impairment. Age (RR: 1.016, p=0.029), sepsis (RR: 2.075, p=0.039) and urine output (RR: 0.82, p=0.008) were independent prognostic risk factors for mortality.

CONCLUSION. ICU clinicians are mainly responsible for ARF management in the ICUs in our country. ARF is associated with high mortality risk, despite biotechnological achievements.

0204

OLIGURIA DURING A 2-HOUR PERIOD (U2): A BEAUTIFUL DAY FOR THE DETECTION OF ACUTE KIDNEY INJURY?

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INTRODUCTION. Acute Kidney Injury defined by the RIFLE classification (AKI-RIFLE) is associated with mortality. Early intervention to prevent development of AKI-RIFLE may therefore improve outcome. AKI-RIFLE can only be detected after a 6-hour period of oliguria or an increase of serum creatinine with 50%. The aim of the study was to evaluate whether a shorter period of oliguria, i.e. a 2 hour period of UO<0.5 mL/kg/hr (U2), is predictive for development of AKI-RIFLE.

METHODS. All patients admitted to the 28 bed adult surgical ICU of the Ghent University Hospital, during a 35 d period were prospectively evaluated for occurrence of U2 and AKI-RIFLE.

RESULTS. 121 patients were included in the study. Median age was 58 yr (interquartile range (IQR) 40.70), and 63% were male. Length of stay in the ICU was 3 d (IQR 2.5), and ICU mortality was 8.3%. AKI-RIFLE occurred in 51 patients (42.1%). AKI-RIFLE was already present on admission in 8 patients (6.6%). One or more episodes of U2 occurred in 80 patients who did not have AKI-RIFLE at admission (70.8%). In 37 patients (46.3%), U2 was not followed within a 48 hour period by development of AKI-RIFLE. On the other hand, 43 patients (53.8%) with U2 did develop AKI-RIFLE within a 48 hour time period. None of the patients developed new AKI-RIFLE without U2. Maximum severity of U2 patients who developed AKI-RIFLE was Risk in 26 patients (32.5%), Injury in 16 patients (20%), and Failure in 1 patient (1.3%).

CONCLUSION. AKI defined by the RIFLE classification occurred in almost half of the patients. A 2-hour period of oliguria was a frequent finding in this cohort of surgical ICU patients, and was followed by development of AKI-RIFLE in half of the patients within a 48 hour time period. A 2-hour period of oliguria was therefore a sensitive tool for detection of development of AKI-RIFLE, and may therefore be an opportunity for early intervention therapy.

0205

ETOMIDATE-INDUCED ADRENAL INSUFFICIENCY IN CRITICALLY ILL PATIENTS

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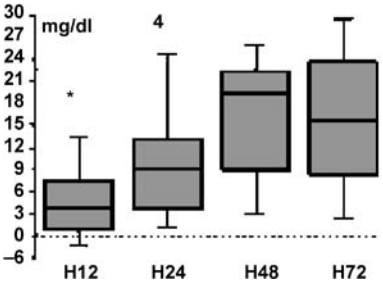
INTRODUCTION. The implication of etomidate in severely-ill patients was recently pointed out as a risk factor for subsequent adrenal insufficiency (AI) in ICU patients. We investigated the prevalence and the duration of the AI following a bolus of etomidate required for endotracheal intubation by measuring serial blood concentrations of cortisol and its substrate, the 11-desoxycortisol.

METHODS. With approval of the local ethical committee and informed consent, 43 critically ill patients were included (28 M/15 F, 46±19 years, SAPS II 39±14, SOFA score 6±4). The blood content of 11-desoxycortisol (nmol/l) and cortisol (μg/dl) was measured before (T0) and after (T60 min) corticotropin stimulation tests (250 μg) realized at H12, H24, H48 and H72 following the injection of etomidate. AI was defined as a cortisol response (Delta F) less than 9 μg/dl. Normal blood content of 11-desoxycortisol was determined from measurements of 15 critically ill patients having received another sedative drug for tracheal intubation. Data (mean±SD) were analysed using ANOVA.

RESULTS. AI was found in 84% of the etomidate population at H12, 48% at H24, 21% at H48, 24% at H72. Evolution of Delta F is represented in the figure (* p<0.01 H12 vs H48, § p<0.01 H24 vs H48). The blood content of 11-desoxycortisol was initially high and decreased to control values at H72 (p<0.01 at H12 and H24 vs. H72).



CONCLUSION. A bolus of etomidate inhibits the 11-β-hydroxylase during 48h, resulting in a high incidence of AI. If etomidate is required, a corticosteroid supplementation could be thus indicated for 48h.

Poster Sessions
Prognosis and outcome 0206-0219

0206

IMPROVING OUTCOME PREDICTION IN CRITICALLY ILL PATIENTS WITH HEMATOLOGIC MALIGNANCIES BY USING SOFA

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INTRODUCTION. The aim of this study was to assess whether outcome prediction can be improved in critically ill patients with hematologic malignancies by taking into account the evolution of organ failures during the first 3 days of ICU stay and the admission diagnosis.

METHODS. All consecutive critically ill patients with hematologic malignancies admitted to the ICU between 2000 and 2006 were included in this study. SOFA scores on day 1-3 and a cancer specific severity of illness score (CSSIS) [1] were calculated prospectively. The admission diagnosis was assessed by an independent panel of physicians blinded to the patients outcome who categorized the patients according the presence or absence, the diagnostic certainty and the site of bacterial infection. The performance of the SOFA on d 1 and two logistic regression models consisting of the SOFA on d 1 adjusted for Delta SOFA (d 3 - d 1) and additionally adjusted for the admission diagnosis respectively, were compared with the CSSIS.

RESULTS. Over the study period 300 patients were admitted in the ICU and 205 were still in the ICU on day 3. ICU, hospital and 6 months mortality was 40%, 55% and 64%, respectively. The expected hospital mortality according to the CSSIS was 71 $\pm$ 26%. Mean SOFA scores on d 1 and 3, and Delta SOFA were 9.0 $\pm$ 4.0, 8.6 $\pm$ 3.9 and -0.5 $\pm$ 3.3, respectively. Patients admitted because of documented or clinically suspected bacterial infection had a higher SOFA on d 1 (9.7 $\pm$ 4.0 vs. 8.4 $\pm$ 4.0 P=0.008) but a more rapidly reversible organ failure (Delta SOFA -1.1 $\pm$ 3.1 vs. 0.0 $\pm$ 3.4, P=0.013) and a lower hospital mortality (44% vs. 64%, P=0.001) than those without. The area under the ROC $\pm$ SE and calibration statistics (chi-square, P-value) for the CSSIS, the SOFA d 1 and the Delta adjusted SOFA were 0.73 $\pm$ 0.03 and 11.1, P=0.20; 0.60 $\pm$ 0.04 and (NA); and, 0.78 $\pm$ 0.03 and 10.4, P=0.24, respectively. The performance further improved by adjusting for the admission diagnosis: 0.83 $\pm$ 0.03 and 6.6, P=0.58. Hospital mortality in patients with and without bacterial infection precipitating ICU admission was 22% vs. 49% (P=0.002) in patients with a SOFA < 8 (median) and 65% vs. 93% (P=0.002) in those with a SOFA > 8, respectively.

CONCLUSION. Outcome prediction in critically ill patients with hematologic malignancies improves by taking into account the evolution of organ failures during the first 3 days of ICU stay and the admission diagnosis. Provided that underlying hematologic illness is not rapidly fatal, it is justified to offer a 3 days therapeutic ICU trial to any of those critically ill patients to maximize chances for survival.

REFERENCE(S). 1) Groeger et al. J Clin Oncol 1998;16:761-770.

0207

AN INDEX TO PREDICT HEATSTROKE - RELATED EXCESS - MORTALITY BASED ON EMERGENCY DEPARTMENTS VISITS

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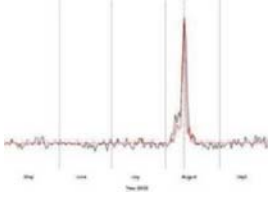
INTRODUCTION. To develop a day-to-day composite index to detect the heat related-over mortality in Paris based on the profile of patients referred to ED.

METHODS. Retrospective study from records of 99.976 adult patients (May 1st - September 30th) over the years 2001,2002,2003. Demographics, social, triage and physical parameters; statistical analysis of the criteria influencing admission during the heat wave period and the development of a composite index to predict mortality in the population exposed to the heat wave.

RESULTS. A composite index (red line) based on age >70-yrs,temperature >39°C, admission after ED-visits could predict the occurence of heat wave-related pre-hospital over-mortality (black line).



CONCLUSION. A composite index developed according to the profile of patients admitted in the ED, appeared suitable for alerting on the overall mortality in the Paris area submitted to heat wave.

0208

PROGNOSTIC SIGNIFICANCE OF NUCLEATED RED BLOOD CELLS IN SURGICAL INTENSIVE CARE PATIENTS

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INTRODUCTION. The appearance of nucleated red blood cells (NRBC) in the peripheral blood is associated with a variety of severe diseases. When NRBC are detected in the blood this is generally associated with increased mortality.

METHODS. In a prospective study the detection of NRBC was analyzed with regard to the clinical circumstances and the course of laboratory parameters of organ injury. NRBC were daily measured in the peripheral blood of surgical intensive care patients (n=284).

RESULTS. NRBC were found at least once in 32.0% of all patients. The mortality of NRBC-positive patients was 44.0% (40/91); this was significantly higher (P<0.001) than the mortality of NRBC-negative patients (4.2%, 8/193). With regard to intensive care mortality, NRBC in blood showed sensitivity and specificity of 83.3% and 78.9%, respectively. The area under curve (C-statistic) was 0.86. Mortality increased with increasing NRBC concentration. All patients with more than 2000 NRBC /µl died. Moreover, mortality increased with increasing frequency of occurrence. When after first detection of NRBC in blood, during the further course of intensive care treatment the NRBC have disappeared from the circulation, the mortality again decreased to values of NRBC-negative patients. NRBC were detected for the first time, on average, 9 days (median 5 days) before death.
Multiple logistic regression analysis under consideration of several other clinical and laboratory risk indicators revealed a significant association between NRBC and increased mortality, the odds ratio being 1.95 (95% confidence interval 1.35-2.82; P<0.001) for each increase in the NRBC category (0/µl; 1-40/µl; 41-80/µl; 81-240/µl, >240/µl). After the initial detection of NRBC in blood there were no significant increases regarding the creatinine concentration and the alanine aminotransferase activity, respectively. However, the appearance of NRBC coincided with increasing C-reactive protein and thrombocyte concentrations, respectively.

CONCLUSION. The detection of NRBC in blood of surgical intensive care patients is of prognostic power with regard to the patients' mortality. This prognostic significance of NRBC was independent of some clinical and other laboratory risk parameters. The appearance of NRBC in blood was not associated with a failure/lesion of the kidney and the liver, respectively.

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0209

DATA MINING FOR THE PREDICTION OF INTENSIVE CARE UNIT (ICU) LENGTH OF STAY (LOS)

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INTRODUCTION. A randomised controlled trial on intensive insulin therapy (IIT) in a medical ICU (1) showed a mortality reduction among patients remaining in the ICU for at least a third day. Unfortunately, predicting LOS in the ICU is virtually impossible on a clinical basis. Machine learning techniques and probabilistic graphical models are statistical methods that can integrate biomedical data and clinical background knowledge (2). The aim of this study was to evaluate them to build classification models for predicting a LOS $\geq$ 3 days.

METHODS. We examined a database of 1548 patients from a randomised controlled trial on IIT in a surgical ICU (3). In this study, 630 patients stayed $\geq$3 days in ICU. A selection of clinical and lab data and the APACHE II from the 1st day in ICU, together with medical history and demographic data, were used as input variables. Data were analysed using 4 techniques: Decision Tree learning (DT), Random Forests (RF), Naïve Bayesian (NB) and Tree-Augmented Naïve Bayesian (TAN) networks. We ran performance tests using 10-fold cross-validation and averaging the measures. Discrimination was assessed by the area under the Receiver Operator Characteristic curve (aROC). Calibration (goodness-of-fit) was assessed by Hosmer-Lemeshow H statistic (p$\geq$0.05).

RESULTS. Performances are summarized in table 1. NB and TAN were more discriminative than DT and RF models. TAN had a poor calibration.

TABLE 1.

	Discrimination (aROC)	Calibration (p-value$\geq$0.05)
DT/RF	0.747/0.792	0.062/0.269
NB/TAN	0.828/0.834	0.099/0.006

CONCLUSION. Data mining could predict a LOS $\geq$3 days, in a database that was not designed for clinical predictions. The learned models from this experiment may not be generalised. The cut-off discrimination (aROC) for predictions upon which a clinical decision is based (such as starting IIT) remains arbitrary. The presented data mining techniques will need prospective validation in a clinical setting.

REFERENCE(S). (1) Van den Berghe G, et al. N Engl J Med 2006;354:449-61.(2) Lucas P. Curr Opin Crit Care 2004;10:399-403.(3) Van den Berghe G, et al. N Engl J Med 2001;345:1359-67.

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0210

DOES N-TERMINAL PRO B-TYPE NATRIURETIC PEPTIDE RELATE TO SEVERITY OF DISEASE IN ICU PATIENTS?

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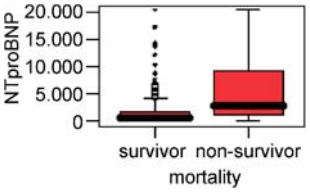
INTRODUCTION. Natriuretic peptides (NP) are secreted by ventricular cardiomyocytes and seem to be related to prognosis of patients with chronic heart failure and acute coronary disease. In critically ill patients this remains controversial. In a prospective study on our mixed intensive care unit, we assessed the relationship between N-terminal pro B-Type Natriuretic Peptide (NT proBNP) level on admission, APACHE II score and ICU mortality.

METHODS. We included all patients between between April and November 2005. NT proBNP was measured and APACHE II score was determined on admission. Data were analyzed and comparisions were made with Spearmans correlation test or Mann Whitney U test as appropriate (SPSS 12).

RESULTS. The median age of the 347 studied patients was 61 (47-71) years. The majority of the patients had a medical reason for admission (69.2%). 55.6% was endotracheally intubuted at admission. Median APACHE II score was 10(6-17) and ICU mortality 25%. Median NT pro BNP was 875(163-3299)ng/l. NT proBNP and APACHE showed a statistically significant correlation (r 0.527. p<0.001). Median (quartiles) NT proBNP in survivors was 445.5(95.0-1734.75) and 2781(900.5-9131.50)ng/l in non-survivors (p<0.001). Both relationships remained statistically significant after correction for age.



CONCLUSION. NT proBNPlevel is related to APACHE II score and ICU mortality.

0211

RELATIONSHIP BETWEEN NURSING WORKLOAD AND SURVIVAL PROGNOSIS ESTIMATION IN CRITICALLY ILL PATIENTS.

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INTRODUCTION. Relationship between death risk and workload estimation systems is somehow controversial. It seems that the best correlation is found when the workload reflects the patients' whole length of stay. This hypothesis has not been assessed using NAS as workload expression system. Our aim in this paper is checking if this general assertion is also true in this case.

METHODS. All patients admitted to our ICU risk of death is estimated by means of MPM II 0 and SAPS 2 systems. NAS is used as daily workload expression tool since 2004. During 2005, 1069 consecutive patients were admitted to our ICU, and all of them were evaluated for their death risk and needed workload by these systems. Correlation between survival prognosis and first day (NAS 1), whole stay (NAS T) and average (NAS PRO) workload was assessed. Results are shown by means of regression coefficient (R2) calculated for every case.

RESULTS. Different regression attempts performed between MPM II 0, severity and prognosis by means of SAPS 2 with respect to NAS 1, NAS TOT AND NAS PRO show regression coefficients (R2) not higher than 0.120 in any case (0.092, 0.059, 0.067, 0.079, 0.064, 0.049, 0.115, 0.089 and 0.103).

CONCLUSION. A significant regression relation between severity or outcome indicators and workload expression could not be found in our ICU. That allows us to conclude that risk death and nursing workload (NAS system) are not dependent each other.

0212

ICU ADMISSION IN PATIENTS WITH HAEMATOLOGICAL DISEASE: PROGNOSTIC FACTORS AND OUTCOME

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INTRODUCTION. Patients with haematological malignancies may experience acute life-threatening complications frequently related to the use of intensive chemotherapy and haematopoietic stem cell transplantation. Survival rates in critically ill patients have improved due to advances in chemotherapy, earlier admission to the intensive care unit (ICU) and selection of patients who are likely to benefit from ICU admission. The objective of this study was to determine the prognostic factors and outcome of this population.

METHODS. Retrospective observational study of 240 admissions, between Jan/00 and Dec/05 at our ICU. Average age was 47 (2-82) years old; 62% were male; 27% had AML, 23% had ALL, 32% lymphoma / myeloma and 18% had other haematological diseases. Average duration of ICU stay was 5.5 (1-58) days.

RESULTS. We analysed the reason for ICU admission (mainly respiratory failure associated with febril neutropenia), stage of disease, type of treatment, presence of graft-versus-host disease and severity scores (median: Apache II-25, SAPS II-54, SOFA-10). Ventilatory support was needed in 76% and invasive mechanical ventilation (IMV) in 63%. The IMV is the only variable that had statistically significance predicting ICU mortality. The ICU survival rate was 49% and the hospital survival rate was 39%; 3% were lost to follow-up. For the remaining 36% patients, survival rate was 93% at 3 months, 70% at 6 months and 43% at 1 year.

CONCLUSION. IMV during ICU stay was the only predictor of outcome, but it did not discriminate clearly between survivors and non-survivors; multi-organ dysfunction needing IMV associated with hepatic and renal failure is mostly fatal; long-term survival is predicted by haematological prognostic factors.

REFERENCE(S). Azoulay É., Afessa B. The intensive care support of patients with malignancy: do everything that can be done. Intensive Care Med 2006, 32:3-5.
Benoit D., Depuydt P. et al. Outcome in severely ill patients with hematological malignancies who received intravenous chemotherapy in the intensive care unit. Intensive Care Med 2006, 32:93-99.
Rabbat A., Chaoui D., et al. Prognosis of patients with acute myeloid leukaemia admitted to intensive care. British Journal of Haematology, 129, 350-357.

0213

DOES OBESITY IN THE ICU INFLUENCE OUTCOME?

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INTRODUCTION. We investigated the possible impact of obesity as assessed by the body mass index (BMI) in the ICU patients included in the SOAP study.

METHODS. All adult patients admitted to the participating centers were included in this multicenter, observational study. Patients were followed up until death, discharge or for 60 days after ICU admission. We classified patients according to the BMI into underweight (<20 kg/m2), normal (20-25 kg/m2), overweight (25-30 kg/m2), obese (30-40 kg/m2), and extremely obese (>40 kg/m2).

RESULTS. Of the 2878 patients (62.3% males), 120 (4.2%) were underweight, 1206 (41.9%) had a normal BMI, and 1047 (36.4%) were overweight. Obesity contributed to 14.7% (n=424) and extreme obesity to 2.8% (n=81) of the study group. The overall ICU and hospital mortality rates for the entire population were 18.1% and 23.5%, respectively. ICU mortality rates were: 19.2, 17.9, 17.3, 19.8, and 19.8% for underweight, normal BMI, overweight, obese, and extremely obese groups, respectively, p=0.599. Hospital mortality rates were also similar among groups. Compared with patients with a normal BMI none of the other groups showed significantly different ICU or hospital mortality rates (p>0.2 for all pair-wise comparisons). Extremely obese patients showed a trend towards longer ICU (median IQ: 4.1 [1.8-12.1] vs. 3.1 [1.7-7.2], days, p= 0.056) and hospital (14.3 [8.4-27.4] vs. 12.2 [5.1-24.3], days, p=0.077) lengths of stay compared to those with a normal BMI. The SAPS II adjusted odds ratio of in-hospital mortality (with normal BMI as a reference group) was 1.27 (95% confidence interval (CI): 0.75-2.14, p=0.371) in underweight, 0.96 (95% CI: 0.76-1.21, p=0.74) in overweight, 0.9 (95% CI: 0.66-1.22, p=0.483) in obese, and 1.15 (95% CI: 0.62-2.13, p=0.650) in extremely obese patients.

CONCLUSION. BMI did not have any significant impact on mortality in this heterogeneous group of ICU patients. A trend towards longer ICU and hospital lengths of stay in extremely obese patients compared to those with a normal BMI suggests a moderate increase in consumption of medical resources in this specific group.

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0214

SOFA SCORE CORRECTED FOR GASTROINTESTINAL DYSFUNCTION BETTER PREDICTS OUTCOME IN MIXED ICU PATIENTS

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INTRODUCTION. The SOFA score is most widely used as organ dysfunction score however it does not take into account gastrointestinal dysfunction (GID). Intraabdominal hypertension (IAH) defined as an intraabdominal pressure (IAP) >12 mmHg and abdominal compartment syndrome (ACS) defined as IAP>20 with new onset organ failure increases morbidity and mortality of ICU patients. The present study looks at the prognostic value of a corrected SOFA score taking into account maximal IAP.

METHODS. In the Critically Ill and Abdominal Hypertension (CIAH) project, we prospectively evaluated shortterm prognosis in patients with IAH admitted to the ICU (1). Data on 556 patients (228 female) were obtained from different studies (single and multiple centre). Age 63.4±17.6; SAPS II 45.5±18.3; APACHE II 20.3±9.5; IAP on admission 10.7±5.8, maximal IAP 13.7±5.3; SOFA 8.1±4.1. Additional SOFA points were given for GID according to the IAP grading suggested by the world society on abdominal compartment syndrome (www.wsacs.org), IAP<12: 0 pts; IAP 12-14: 1 pt; IAP 15-19: 2 pts; IAP 20-24: 3 pts and IAP>25: 4pts. This gave a corrected SOFA (SOFAcor) of 9.3±4.5. Statistical analysis was performed with unpaired student's t test and a p-value < 0.05 was considered significant.

RESULTS. IAH and ACS developed respectively in 62% and 13.3% of patients. 214 patients died in the ICU (38.5%). Mortality was significantly higher in patients with IAH (47.8% vs 23.2%) and ACS (52.7% vs 36.3%). All severity scores were significantly higher in nonsurvivors vs survivors. Baseline IAP was not significantly different between nonsurvivors and survivors whereas maximal IAP was (15.4±5.2 vs 12.7±5.1). The area under the receiver operating characteristics curve was the highest for the SOFAcor (0.76) vs SOFA (0.75) vs SAPS II (0.74) and APACHE II (0.72) suggesting better discriminative power for SOFAcor.

CONCLUSION. A corrected SOFA score taking into account GID (assessed by IAP) better predicts outcome than the classic SOFA or other severity scores. We believe that GID needs to be taken into account in future studies evaluating organ failure assessment.

REFERENCE(S). 1. Malbrain et al. Incidence and prognosis of intraabdominal hypertension in a mixed population of critically ill patients: a multiple-center epidemiological study. Crit Care Med. 2005 Feb;33(2):315-22.

0215

BETTER MORTALITY PREDICTION BY INCLUDING THE EVOLUTION OF SEVERITY OF ILLNESS IN THE APACHE II SCORE

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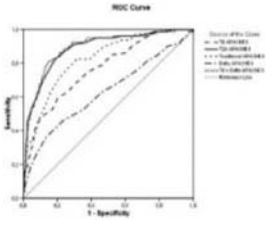
INTRODUCTION. Outcome prediction is important in ICUs. The APACHE II score is a frequently used scoring system for research and clinical purposes. A main part of the APACHE II score is derived from a set of physiological variables of which the worst value within the first 24-hrs of ICU observation is taken into account. Because a patients' health status might alter substantially, either positively or adversely, we evaluated whether the evolution of severity of illness over the first 24-hrs of ICU admission, improves prediction of in-hospital mortality.

METHODS. Prospective cohort study. A total of 347 consecutive general ICU patients admitted for at least 48-hrs to the medical and surgical ICU between 1 January 2005 until 31 August 2005 were included. The AUROC of the APACHE II score upon admission (T0) and after 24-hrs of admission (T24), the delta-APACHE II (T24-T0), and a logistic regression model consisting of T0 adjusted for delta were compared with the traditional APACHE II score.

RESULTS. Of the 347 patients, 80 (23.1%) died in the hospital. Mean T0, T24, traditional, and delta-APACHE II were 15.0±7.1, 13.0±6.6, 19.7±7.7, and -2.0±4.7, respectively. The AUROCs were 0.77 (0.71-0.83), 0.89 (0.85-0.93), 0.83 (0.78-0.88), and 0.63 (0.55-0.70), respectively. The discriminative ability of T0 improved after adjusting for the delta to 0.89 (0.85-0.93), however it was not superior to T24.



CONCLUSION. Taking into account the evolution of severity of illness within 24 hrs of ICU admission improves in-hospital mortality prediction. Both the T0 adjusted for the delta and the T24 had a better discriminative ability than the traditional APACHE II score. Although both had similar AUROCs the latter is far more easy to calculate.

0216

COMPARISON OF THREE SCORING SYSTEMS IN MEDICAL INTENSIVE CARE PATIENTS

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INTRODUCTION. In light of the need for cost reduction in public health care systems and as an instrument of quality management scoring systems are becoming more important in intensive care. In a prospective controlled study we compared the Acute Physiology and Chronic Health Evaluation II Score (APACHE II), the Simplified Acute Physiology Score (SAPS) and the Therapeutic Intervention Scoring System (TISS) in medical intensive care patients.

METHODS. In 555 patients admitted to the Medical Intensive Therapy Unit (ITU) of the Evangelische Krankenanstalten Duisburg-Nord APACHE II, SAPS and TISS were recorded on days 1,3,5,7,9 and 11 of patients' stay on ITU. For calculation of the scores, data were collected in a SPSS matrix. Mann-Whitney-U-test was used to detect differences between survivors and non-survivors. After application of Bonferroni's procedure, p<0.05 was considered significant. The quality of prediction was assessed by receiver operating curves (ROC). Sensitivity, specificity, positive predictive value and the probability of death were calculated for several arbitrarily determined cut-off values.

RESULTS. In 465 patients scores were completed on day 1. Approximately 44% of the main medical diagnoses were cardiac, 18% gastroenterologic, 10% neurological and 8% pulmonary. APACHE II values were significantly higher in non-survivors (n=108) on days 1,3 and 5 than in survivors (n=357, p<0.006). SAPS values were significantly higher on day 1,3,5,7,9 in non-survivors (p<0.006). TISS values differed significantly on day 1,3 and 5 (p<0.006). For APACHE II (SAPS/TISS) the area under the curve was 0.665 (0.703/0.676) on day 1 of treatment, 0.725 (0.750/0.708) on day 3 and 0.675 (0.753/0.671) on day 5. Over time sensitivity decreased while specificity and positive predictive values increased.

CONCLUSION. APACHE II, TISS and SAPS are suitable for discrimination between survivors and non-survivors in medical intensive care. All three scores are potential predictors of prognosis and severity of illness in these patients. The discriminatory power increased by calculating the scores at the third day of intensive care treatment. Compared to APACHE II and TISS, SAPS showed the best performance in prognosis of outcome in medical patients needing intensive care treatment. However, these findings need to be validated in multi-centre studies.

0217

INTENSIVE CARE AND THE VERY OLD: A 5-YEAR REVIEW AT A TERTIARY REFERRAL HOSPITAL

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INTRODUCTION. World Bank statisitcs show the elderly population has increased dramatically. People over 90 have increased by 42% in the last decade in the USA. Reflecting this, ITU is offered to older patients: those over 65 account for more than 50% of the ITU occupancy [1]. This study of tertiary referral hospital patients with multiple comorbidities, compared outcomes for all ITU patients aged over 80 with patients less than 80.

METHODS. Notes for elderly ITU patients (aged 80 years or more), admitted between 2000 and 2005 were reviewed; together with routine data that is recorded for all patients admitted to our ITU: APACHE II data; diagnosis; length of stay and outcome.

RESULTS. Of 1668 admissions to ITU: 5.75% (96) were elderly; with a mean age of 84 compared to 56.1 for all other admissions. Notes were available for 57 elderly patients: 24 were medical: 4 (16%) survived to discharge home. 20 had elective surgery: 14 (70%) were discharged home. 13 had emergency surgery: 4 (31%) were discharged home. Combining the 37 emergency medical and surgical patients, 22% survived to hospital discharge. Compared to elective elderly patients: they had higher APACHE II scores (21.7 vs 17.1); more organ failure (2.6 vs 1.2) and organ support; and greater ITU (47 vs 20%) and hospital (78 vs 30%) mortalities. There were no differences in-terms of treatment limitation. Comparing emergency patients aged over and under 80: the elderly had higher APACHE II scores (21.7 vs 19.6); length of stay (14 vs 12); ITU mortality (47 vs 34% p=0.08) and hospital mortality (78 vs 41%; P<0.001). Comparing elective patients aged over and under 80 years: the elderly had greater APACHE II scores (17.1 vs 13.4); length of stay (10 vs 8); ITU mortality (20 vs 7.7% p=0.07) and hospital mortality was (30 vs 13% p = 0.004).

CONCLUSION. ITU patients aged over 80 had significantly greater hospital mortality compared to those less than 80. Only 22% of emergency admissions and 70% of electives were discharged. However none required nursing home care and all were alive at 6 months except one. The APACHE II score predicted ITU mortality but did not estimate the very large number of patients who die after ITU discharge, in-part due to those discharged for ward palliative care.

REFERENCE(S). 1: Angus D et al. Current and projected workforce requirements for care of the critically ill and patients with pulmonary disease. JAMA 2000. 284: 2762-70.

0218

COMPARISON OF SEVERITY-OF-ILLNESS SCORES IN SEPTIC PATIENTS FOR PREDICTION OF MORTALITY

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INTRODUCTION. Severity of illness scoring systems are widely used in intensive care practice. However, their use in patients with sepsis are largely bee limited to means of stratification in clinical trials. As newer sepsis therapies become available, it may be possible to use such systems for refining their indications and monitoring their utilization. The aim is to evaluate the ability of severity of illness scoring systems (APACHE II, APACHE III, SAPS II) and organ dysfunction scores to predict hospital mortality in adult intensive care patients with sepsis.

METHODS. A prospective observational cohort study was performed over 6 months in a medical ICU of a tertiary hospital. All consecutive patients with definite diagnosis of sepsis admitted to the ICU were included in the present study. Discrimination was assessed by area under ROC curves and calibration was done using Hosmer-Lemeshow goodness of fit test, calibration curves and observed / predicted mortality correlations.

RESULTS. A total of 88 patients were included. The observed hospital mortality was 50.5%. Results of calibration and discrimination are shown in table.
No statistically significant differences in accuracy of prognosis prediction were identified for the scales assessed.

TABLE 1.

	Discriminat ROC curves AuROC	IC 95%	Calibration HL test Chi2	G-of-fit gl	p	Mortality Pearson	Obs/predic p
APACHE III	0.825	0.73-0.91	11.7	8	0.16	0.836	.003
APACHE III	0.846	0.76-0.92	3.90	7	0.79	0.891	.001
SAPS II	0.821	0.74-0.90	3.36	8	0.91	0.950	.000
SOFA	0.812	0.71-0.90	5.41	7	0.61	0.963	.000
MODS	0.790	0.69-0.88	2.06	6	0.91	0.947	.000

CONCLUSION. The scoring systems showed a good calibration and discrimination in septic ICU patients In addition, there was no advantage of organ dysfunction scores over the other general models.

REFERENCE(S). 1-Ridley S. A. Uncertainty and scoring systems. Anaesthesia 2002; 57: 761-767.
2-Barriere S, Lowry S. An overview of mortality risk prediction in sepsis. Crit Care Med 1995; 23 (3): 376-393.
3-Rosenberg A. Recent innovations in intensive care unit risk-prediction models. Curr Opin Crit Care 2002; 8: 321-330.

0219

MOST PATIENTS WHO DIE IN THE ICU DO SO AFTER TREATMENT LIMITATIONS HAVE BEEN INSTALLED

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INTRODUCTION. Patients who are admitted to the ICU are mostly offered the whole range of ICU interventions. However, during the course of intensive treatment, treatment options could be limited for several reasons. This study was done to see how often treatment options are limited in patients who eventually die in the ICU.

METHODS. The unit is a 10 bed closed format general ICU in a 550-bed general hospital. Two thirds of patients are surgical. All charts of all patients who died in the ICU from January 1st, 2005 until December 31st, 2005 were examined retrospectively. In our hospital patients are supposed to receive a resuscitation code upon admission from the admitting doctor. When the patient's situation or preferences change, the resuscitation code can be changed at any time. Code 1 stands for all treatment including tracheal intubation and cardiopulmonary resuscitation (CPR). Code 2A allows CPR but no mechanical ventilation outside CPR. Code 2B allows mechanical ventilation but no CPR. Code 3 allows no mechanical ventilation or CPR. There are three different codes 3: 3A allows ICU treatment, 3B allows no ICU treatment and 3C allows only palliative treatment.

RESULTS. In the study period, 794 patients were admitted to the ICU with a mean age of 66.7 years, range 16-100 years and a mean APACHE II score of 13.6, range 0-41. Sixty-seven patients mean age 72.6 years, range 37.5-92.9, mean APACHE II score 24.5, range 7-41, died in the ICU after a median length of stay of 1.5 days, range 0-104 days. Another 45 patients died in the hospital after ICU discharge. All 15 patients that died with code 1, recieved CPR. Ten (67% of these patients had been admitted for less than 24 hours.

TABLE 1.

Resuscitation codes in 67 patients.

	Code at ICU admission	Code at time of dying
Code 1	47 (70%)	15 (22%)
Code 2A	0	0
Code 2B	14 (21%)	8 (12%)
Code 3A	7 (10%)	7 (10%)
Code 3B	0	0
Code 3C	0	37 (55%)

CONCLUSION. Most patients who die in the ICU, do so after a decision to limit treatment has been made. CPR is predominantly used in patients who have only just been admitted.

Poster Sessions
Bleeding and metabolism 0220-0231

0220

ROLE OF RECOMBINANT FACTOR VIIA IN HAEMORRHAGIC SHOCK: A SINGLE-CENTRE PROSPECTIVE STUDY

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INTRODUCTION. Haemorrhagic shock (HS) is a major cause of death in European Intensive Care Units (ICU). We here report our experience with the use of Recombinant factor VIIa (rFVIIa) (Novo Seven) as rescue haemostatic strategy for the management of patients presenting with HS.

METHODS. Twenty patients admitted to the ICU with HS following trauma (n=7) or surgery (n=13) were prospectively enrolled and randomized in the study during 8 months, family informed consent and institutional agreement were obtained. HS was defined as hypotension (mean arterial pressure < 60 mmHg), subcritical anaemia (Hb < 8 gr/dL), macroscopic haemorrhage and uncontrolled bleeding (transfusions of more than 3 units of blood within 2 hrs). All patients received Red Blood Cells (RBC), Fresh Frozen Plasma (FFP) and Blood Platelets (BP). Calcium, proteins, fibrinogen (>1.5 g/L) concentrations and temperature were corrected. Five out of the 20 enrolled patients received a single vial of 4.8 mg of rFVIIa, independently of the body weight, as recommended by published rFVIIa dosing policies (1). All patients underwent a surgical exploration or radiological procedure before administration of rFVIIa. For statistical analysis a Shapiro-Wilk test and a Student T-test were used.

RESULTS. Transfusions requirements (RBC, FFP and BP) were compared between the two groups. The need for RBC transfusions (units, mean±SD) decreased significantly from 22.8±12.1 to 1.4±2.6 (p = 0.01) among patients treated with rFVIIa. A similar although not statistically significant trend was observed FFP transfusions (17 versus 3 units, p = 0.19) and BP (2.2 versus 0 units, p = 0.21). The mortality rate did not differ between the two groups (3/5 versus 9/15). However, haemorrhage was the cause of death in only 33% of patients who received rFVIIa and in 66% of those who did not (p<0.001).

CONCLUSION. As suggested by our study, treatment with rFVIIa of patients with uncontrolled bleeding reduces the transfusions requirements and the haemorrhage-associated mortality. Individual responses remain however unpredictable.

REFERENCE(S). (1) Goodnough et al, Transfusion medicine service policies for recombinant factor VIIa administration. Transfusion 2004;44:1325-1331.

0221

PROTHROMBIN TIME IN THE PATIENTS WITH VENTRICULAR ASSIST DEVICE AS A BRIDGE TO HEART TRANSPLANTATION

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INTRODUCTION. Mechanical circulatory support is an important adjunct to the management of the end-stage heart failure patients, and is the standard of care for most potential heart transplant patients with life-threatening congestive heart failure refractory to conventional therapy. Proper selection of patients who would derive the most benefit from this support is essential. Prolonged prothrombin time (PT > 16 s) before mechanical circulatory support implantation was shown to be one of the most significant risk factors for mortality (1), and thus low survival rate to heart transplantation in these patients.

METHODS. We retrospectively studied 25 consecutive adult heart transplant candidates (April 2003 to February 2006) with average age 46.5 years (range 18–65 years) who underwent implantation of biventricular assist device (VAD) as a bridge to heart transplantation. All the patients were treated by unfractioned or low molecular weight heparin, but not warfarin before surgery. PT was documented on the day before the implantation of VAD, and 24 hours after surgery. The number of surgical reexplorations was also noted. Survival rate to heart transplantation was evaluated with regard to preimplantation PT. P values < 0.05 were considered significant.

RESULTS. 18 (72%) patients survived to heart transplantation with support time (mean±SD) 54.3±32.8 days. 7 patients (28%) died before transplantation due to multiorgan failure or sepsis after support time 25.1±27.7 days. The baseline PT (17.3±2.7 s [59.4±13.4%] vs 18.7±4.8 s [52.6±13.0%]; p = 0.3476), and PT 24 hours after surgery (14.5±1.2 s [78.3±9.9%] vs 14.5±1.5 s [75.4±12.0%]; p = 0.6275) were not different between survivors and non-survivors, respectively. The number of surgical reexplorations (1.4±1.1 vs 1.4±0.7; p = 0.6786) was not different also.

CONCLUSION. Preoperative PT was prolonged in all VAD implanted heart transplant candidates, and it decreased 24 hours after VAD implantation to the same degree in survivors and non-survivors. Preoperative PT was not associated with survival to heart transplantation or the number of surgical reexplorations.

REFERENCE(S). 1) Rao V, et al. J Thorac Cardiovasc Surg 2003;125:855–62.

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0222

RECOMBINANT ACTIVATED FACTOR VIIA STOPS ACBL IN CRITICALLY ILL PATIENTS

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INTRODUCTION. Acute Bleeding (ACBL) in critically ill patients is associated with high mortality rate and a considerable consumption of blood fractions (BFC). Recombinant activated factor VIIa (rhFVIIa) may be considered as a pharmacological complementary treatment for critically ill patients suffering from ACBL. The aim of this report is to present a serial of patients that suffered from ACBL treated with rhFVIIa.

METHODS. We included critically ill patients with ACBL after a regular protocol of treatment with blood and its fractions without an optimal response. We defined as Independent variables: etiology of bleeding, time of administration and doses of rhFVIIa, number of units of BFC administered during treatment with rhFVIIa. Dependent variable: stop of bleeding.

RESULTS. From July 2005 to February 2006 eight patients (five women and three men) received rhFVIIa, median of age of 40 yr (range 12 to 73). Patients were divided in two groups. Group I (n= 4); Patients who received rhFVIIa during the first 12 hours of ACBL (early treatment); median of 8 h (range 2 to 12) and Group II (n= 4) patients who received rhFVIIa after 12 hours (late treatment); median of 24 h (range 14 to 27). The etiology of bleeding: Group I; hepatic transplant (patient 1), post chirurgical (patients 2 and 3), and pulmonary vasculitis (patient 4) and for Group II; Trauma multiple (patients 5 and 6), Lymphoma (patient 7) and HELLP syndrome (patient 8). The median for APACHE II score: Group I; 14 (range 12 to 50) and Group II; 13 (range 10 to 24). BFC during rhFVIIa administration: number of red cells units: Group I; 3 (range 1 to 6), Group II; 5 (range 4 to13). Fresh frozen plasma: Group I; 3 (range 2 to 5); Group II; 3 (range 3 to 7). Platelets apheresis: 1.5 (range 0 to 3), Group II; 4 (range 1 to 6). Number of applications of rhFVIIa: Group I; 1 (range 1 to 3), Group II; 2 (range 1 to 3). Total doses of rhFVIIa: Group I: 7.80 mg (range 5 to10), Group II 9.6 (range 6 to 24). Bleeding control: Group I; all 4 patients treated. Mortality: Two patients died due to primary disease (2 and 4). Group II; two patients died secondary to ACBL (patients 5 and 7), one more (patient 6) died due to complications of trauma multiple no related with ACBL.

CONCLUSION. Early administration of rhFVIIa stopped ACBL in critically ill patients. However, more studies has to be perform to determine the efficacy on cost benefit and mortality.

0223

OFF-LABEL USE OF RECOMBINANT ACTIVATED FACTOR VII (RFVIIA) FOR LIFE-THREATENING HAEMORRHAGE

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INTRODUCTION. There is much interest in the "off-label" administration of rFVIIa as adjunctive treatment in major haemorrhage. Optimal patient groups and circumstances for this use remain unclear. rFVIIa administration for haemorrhage in non-haemophiliac patients in the Cheshire and Mersey region of the UK was investigated.

METHODS. Retrospective analysis of records of 26 patients (median age 55 [17–77] years; 16 male, 9 female) treated with rFVIIa for life-threatening haemorrhage at 6 hospitals. Coagulation parameters and blood-product transfusion over 24 hours were compared before and after first dose rFVIIa using the Wilcoxon signed rank test. Factors affecting subsequent PRBC transfusion and survival to ICU discharge were examined using Pearson correlation and Fisher exact tests.

RESULTS. There were 15 surgical (3 cardiothoracic), 8 trauma, 2 obstetric and 1 medical patients. 61% were coagulopathic at time of rFVIIa administration. Prior blood product use varied considerably (Table 1). Total dose of rFVIIa ranged from 60 μg/kg to 360 μg/kg. Mean INR and APTT decreased significantly following rFVIIa (from 1.5 to 1.3 and 62.3 to 43.0s, respectively, p<0.001). Transfusion of PRBC, FFP and platelets also decreased significantly (Table 1). PRBC transfusion following rFVIIa was inversely related to temperature (p=0.0149). Survival to ICU discharge was 58%. No patient died of haemorrhage. Of the 4 patients with pH <7.1 at time of rFVIIa use, none survived. 1 patient, following rFVIIa administration, developed an hepatic infarction and died.

TABLE 1.

	Before rFVIIa	After rFVIIa	p Value
PRBC	16.8 ± 10.2	5.8 ± 8.4	< 0.001
FFP	10.5 ± 5.6	4.5 ± 6.3	0.003
Platelets	3.8 ± 2.9	2.0 ± 2.6	0.006
Cryoprecipitate	8.3 ± 8.9	6.0 ± 9.7	0.196

CONCLUSION. In conjunction with surgery and conventional therapy, rFVIIa use for haemorrhage was associated with a significant reduction in blood product transfusion and normalisation of clotting parameters. Coagulation, temperature and perhaps pH should be optimised prior to rFVIIa use. rFVIIa use may be futile in profoundly acidaemic patients.

0224

RECOMBINANT ACTIVATED FACTOR VII IN LIVER TRANSPLANTATION

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INTRODUCTION. Uncontrolled bleeding is a severe complication after liver transplantation. Previously results show that r FVIIa may reduce bleeding in patients with hemophilia, in cirrhotic patients with upper gastrointestinal bleeding.

METHODS. We investigated 16 patients with the hemorrhage as a result of the disturbances in the system of coagulation in the perioperative period with the transplantation of the liver. In the first group (n=8) we used rFVIIa 2.4 mg (1.2- 4.8mg) of them 6 i/o, 2 p/o. In the second groups (n=8) we used conventional protocol without rFVII. Were checked the volume of blood loss, quantity of transfused allogenic erythrocytes, FFP, thrombocytes, coagulogram and the level of thrombocytes.

RESULTS. The average volumes of blood loss during the operation and the first 24 hours of postoperative period in 1 group was 1816 ml (1300-2200), in 2 groups 2890 ml (1600-8500)(p<0.05).
An average volume of transfused allogenic erythrocytes in the first group was 184 ml (0-580) and 828 ml (390 -1900) (p<0, 05) in the second, respectively FFP - 1285 ml (740-1800) and 1825(900-4000). Reliable difference with the use of the donor's thrombocytes was not determined. The level of INR to 2 p/o days were 1.7+-0.2 and 2.3+-0.3 (p<0.05), APTT- 44+-3 and 51+-4.

CONCLUSION. rFVIIa was proved to be effective in the therapy of hemorrhage, as a result of the disturbances in the system of hemostasis in the transplantation of the liver.

REFERENCE(S). Chuamsumrit A., Recombinant activated factor VII in children with acute bleeding resulting from liver failure and disseminated intravascular coagulation. Blood Coagulation and Fibrinolysis. 2000; 11 (suppl. 1): 101-105.

0225

LOW BLOOD GLUCOSE DECREASE IN-HOSPITAL LENGTH OF STAY IN CARDIAC SURGERY PATIENTS

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INTRODUCTION. Blood glucose levels in intensive care patients have gained interest over the last decade. It has been shown that lowering blood glucose to normal levels can reduce morbidity and length of stay (LOS) for patients in the ICU (1). In our thoracic surgery ICU a tight blood glucose control regime has been used since 2004. Insulin infusion is administered to patients with blood glucose above 6.1 mM to a target level between 4.5 and 6.1 mM. The regime is stopped with discharge from the ICU. This study is a retrospective survey of all post cardiac surgery patients with registered blood glucose admitted to the ICU in 2005.

METHODS. Data from all 538 patients admitted to the ICU with registered mean blood glucose, length of stay (LOS) in ICU, LOS in-hospital and the logarithmic EUROscore was calculated. Statistics was done with students t-test with Bonferroni correction for comparison between groups, p<0.0125 was considered significant. Odds ratio (OR) was calculated for mortality d.

RESULTS. 97 of 538 patients had a mean blood glucose level below 6.1mM. When comparing the group of patients with a mean blood glucose <6.1mM to the >6.1 mM group LOS in-hospital was significantly higher in the > 6.1mM mean blood glucose group: 5.7±2.4 vs. 6.7±3.3 day (mean±SD) (p<0.003). LOS in ICU was not different between the two groups: 1.2±1.1 vs. 1.5±2.1 days. OR for 30 and 90 days mortality between groups was 1.0 and 1.1 respectively. Euroscore (log) was not different between groups: 9.2±15.3 vs. 7.7±10.6.

CONCLUSION. Even with a relatively short ICU stay, tight blood glucose control can be associated with a shortening in length of in-hospital stay. However, less than 20% of the patients admitted to the ICU reached mean blood glucose level within the target area and mortality was not affected.

REFERENCE(S). Van der Berghe G. NEJM 2001;345:1359-67.

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0226

INTENSIVE INSULIN THERAPY DOES NOT CHANGE URINARY GST A1 AND P1 EXCRETION AFTER CABG

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INTRODUCTION. Cardiac surgery is an important risk factor for the development of acute renal failure. Strict control of plasma glucose reduces the incidence of renal failure in ICU patients. Glutathione S-transferases (GST) are cytosolic enzymes that can be used as markers of tubular injury. They are early predictors for acute renal failure. We investigated whether intensive insulin therapy exerts a renal cytoprotective effect in ICU patients after cardiac surgery.

METHODS. We performed a randomized controlled trial in non-diabetic patients undergoing elective coronary bypass surgery. 20 patients were randomly assigned to an intensive (insulin therapy to maintain blood glucose between 80-110 mg/dL) or conventional (insuline therapy when blood glucose exceeds 200 mg/dL) treatment. We determined urinary excretion of GSTA1 (in proximal tubular cells) and GSTP1 (in distal tubular cells) 0-4 h and 20-24 h after cardiac surgery. Urinary GSTA1 and GSTP1 levels were measured by ELISA.

RESULTS. Both patient groups were comparable in demographics and clinical characteristics. In the intensive treatment group glucose levels were significantly lower than in the conventionally treated group. After cardiac surgery urinary GSTA1 and GSTP1 concentrations were increased in all patients compared to normal controls. Urinary GSTP1 concentrations decreased from 1.61±0.85 mg/mmol creatinine at 0-4 h to 1.09±0.61 mg/mmol creatinine at 20-24 h in the conventional treatment group (P=0.01) and from 1.37±1.28 mg/mmol creatinine at 0-4 h to 0.83±0.42 mg/mmol creatinine at 20-24 h in the intensive treatment group (P=0.44). There were no significant differences between groups. GSTA1 decreased in the conventionally treated patients from 3.43±3.32 mg/mmol creatinine at 0-4 h to 1.77±0.99 mg/mmol creatinine at 20-24 h (P=0.18). GSTA1 increased in the insulin treated patients from 1.63±1.22 mg/mmol creatinine at 0-4 h to 2.44±2.14 mg/mmol creatinine at 20-24 h (P=0.25). Differences between groups were not statistically significant. No differences were found in plasma creatinine concentrations.

CONCLUSION. Cardiac surgery results in an increased excretion of the markers of proximal and distal tubule injury. Strict glucose regulation does not significantly alter the urinary excretion of these markers during the first 24 hours after cardiac surgery. These results suggest that intensive insulin treatment does not exert a direct renal cytoprotective effect.

0227

DO STRICT GLYCEMIC CONTROL AND TISSUE PERFUSION OPTIMIZATION HAVE AN IMPACT ON IN-HOSPITAL MORTALITY?

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INTRODUCTION. Since 2001, the favorable impact of strict glycemic control (SGC) and tissue perfusion optimization through central venous oxygen saturation (ScvO2) measurement on in-hospital mortality has become evident in critically ill patients (pts). The objective this study is to assess the impact of the implementation of a SGC protocol and another of rational ScvO2 management on in-hospital mortality over time.

METHODS. Cohort of 1.451 pts admitted to a Surgical Intensive Care Unit (SICU) between January 2003 and December 2005. According to the year of admission, the pts were divided into three groups: G1 (2003) - 467 pts, in whom the SGC and ScvO2 assessment was occasional; G2 (2004) - 473 pts, in whom the implementation of SGC and ScvO2 protocols was frequent; and G3 (2005) - 511 pts, in whom the SGC and ScvO2 protocols were implemented in all critically ill pts. The Kruskal-Wallis and chi-square tests were used for continuous and categorical variables, respectively, to compare the following parameters between the groups: in-hospital mortality (IHM); age; and mean and first-admission-day MODS (MODSm and MODSD1, respectively).

RESULTS. The IHM was lower in G3 (5.6%) when compared with that in G2 (10%) and G1 (8.7%), p = 0.027. Mean age and MODSD1 did not differ between groups; MODSm at admission was significantly lower in G3 (G1=1.97±2.31; G2=1.89±2.1; and G3=1.84±2.2; p=0.026).

CONCLUSION. The findings suggest that the implementation of the SGC and ScvO2 protocols has a favorable impact on IHM.

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0228

INCREASED ARTERIAL BLOOD LACTATE CONCENTRATION AFTER INSULIN INFUSION

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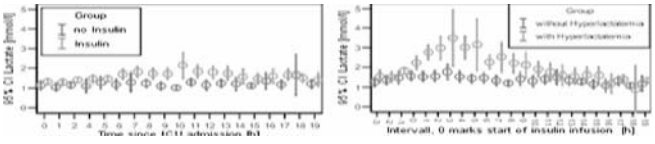
INTRODUCTION. The recent interest in tight glycaemic control has increased the use of insulin infusions in critically ill patients. Arterial blood lactate is used commonly as a surrogate marker for decreased tissue perfusion, but may also reflect alterations in glycolysis. We have observed a temporary increase in arterial blood lactate concentration in some patients following commencement of an insulin infusion.

METHODS. An audit was performed of arterial blood gas analysis on 124 consecutive patients post coronary artery bypass (CABG) surgery in an academic, tertiary hospital intensive care unit. Patients were divided into 3 groups: No insulin, insulin without hyperlactataemia (defined as 50% increase in arterial blood lactate concentration measured prior and one hour post commencement of insulin) and insulin with hyperlactataemia. Insulin treatment was started on discretion of the treating specialist.

RESULTS. The demographics of all three groups were similar including hospital outcome. However, of the 77 (62%) patients requiring insulin to maintain glycaemic control, 25 (32%) demonstrated an increase in arterial blood lactate concentration, peaking at 3 hours and normalising after 8 hours, as demonstrated in Figure 1. Multivariate analysis did not show any other influences on arterial blood lactate concentration. There was no overt evidence of tissue hypoxia in the insulin and hyperlactataemic group.



CONCLUSION. Administration of insulin in some patients post CABG may result in hyperlactataemia, which does not appear to be related to hypoperfusion or an adverse outcome. The mechanism of this hyperlactatemia in only some patients remains unclear, but may relate to a genetic difference in the balance between myocardial and skeletal muscle lactate metabolism post CABG.

0229

GLUCOSE CONTROL IN CARDIAC SURGERY PATIENTS ACCORDING TO INSULIN INFUSION PROTOCOL – A QUALITY CHECK

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INTRODUCTION. Studies have shown the importance of tight blood glucose (Glc) control to reduce mortality and morbidity amongst critically patients [1]. However, not only the optimal glucose range but also treatment strategies are still a matter of vivid discussion. We examined the effectiveness of a strictly protocol-guided insulin infusion therapy versus a liberal nursing staff dependent therapy in cardiac surgery patients.

METHODS. Local ethical committee accepted, single-center, prospective study with retrospective controls. After given written consent 164 patients (Protocol Group) admitted to elective open heart surgery were treated according to an hourly-glucose-measurements-based insulin infusion protocol during the operation and within 24 hours after admission to the ICU. Blood glucose management of the control group in 108 patients (Non-Protocol Group) was liberally led by the nursing staff. The aim in both groups was to maintain blood glucose levels between 80-180mg/dl. We compared minimum, average and maximum glucose levels and the amount of the infused insulin dosages (International Units/hour, IU/h). Statistics: Data presented in mean ± standard deviation, Student's T-Test.

RESULTS. Preoperative base line glucose levels were not different between the Protocol- and Non-Protocol Groups (Glc mg/dl, 115±25 versus 113±32, p=0.45); postoperative Glucose levels and insulin infusion rates were as follows: Glucose mg/dl, min: 106±18 vs 118±25, average: 137±20 vs 163± 26, max: 177±38 vs 212±56, p<0.001; Insulin IU/h, min: 1.3±1.1 vs 1.2±1.2, p=0.1 average: 2.6±1.5 vs 2.1±1.5, p=0.02; max: 4.9±2.7 vs 3.4±2.9, p=0.08. We could not find a significant difference in total insulin dosage between groups.

CONCLUSION. To achieve beneficial tight glucose control clinicians may not sufficiently rely on "common practice" but use strict insulin infusion protocols. According to our data the potential of hourly adjusted insulin infusion rates in a protocol guided concept may not even lead to significant higher consumption of insulin.

REFERENCE(S). 1. van den Berghe G, Wouters P, Weekers F et al. N Engl J Med 2001 Nov 8;345(19):1359-67.

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0230

EPIDURAL ANALGESIA IMPROVES GLYCEMIC CONTROL IN DIABETIC PATIENTS AFTER CARDIAC SURGERY

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INTRODUCTION. As revealed by several studies, mortality after cardiac surgery can be related to glucose blood levels (1). Epidural anaesthesia reduces the level of stress hormones that accompanies cardiac procedures (2). The aim of the study was to evaluate if epidural anaesthesia could improve postoperative glycaemic control in cardiac surgery.

METHODS. This prospective randomized study included 50 cardiac surgical patients affected by non-insulin dependent diabetes mellitus. Twenty-five patients received combined high thoracic epidural anaesthesia with total intravenous anaesthesia (TIVA) (group A) and 25 patients received exclusively TIVA (group B). All patients received a continuous i.v. infusion of insulin until the second postoperative day. We recorded total insulin dose infused, blood glucose levels and the average time requiered to achieved normoglycaemia.

RESULTS. The results are shown in the following table. There were no differences between groups regarding demographic data, type of surgical procedures, duration of cardiopulmonary bypass, use of inotropes. A significant correlation between type of anaesthesia and glycaemic levels has resulted. In group A normoglycaemia was achieved in shorter periods without increasing the incidence of hypoglycaemic events.

TABLE 1.

	Glycemic Levels (mg/dL)	Hypoglycaemic Events	Insulin Dose (mU/Kg/h)	Time to Achieve Normoglycaemia (hrs)
Group A	108 (58 – 193)	6	29	5.5
Group B	115 (43 – 228)	9	35	8.4
p-value	0.037	0.133	0.182	0.042

CONCLUSION. Epidural analgesia provides an improved control of postoperative glucose levels after cardiac surgery.

REFERENCE(S). 1) Schricker T, Carvalho G. Pro: Tight Perioperative Glycemic Control. J Cardiothorac Vasc Anesth 2005; 19:684-688.
2) Moore C M, Cross M H, Desborough J P, et al. Hormonal effects of thoracic extradural analgesia for cardiac surgery. Br J Anaesth 1995;75(4):387-393.

0231

HYPERNATREMIA IN THE SURGICAL ICU

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INTRODUCTION. Hypernatremia is a common electrolyte disorder in the surgical intensive care unit (S-ICU). This study evaluates the risk of several factors of hypernatremia in the S-ICU.

METHODS. A case-control retrospective study was conducted by data extracted from the electronic data base. Group 1 consisted of normonatremic patients and group 2 consisted of hypernatremic patients. The factors that evaluated were age, gender, APACHE II score, sepsis criteria, days of ICU stay, mortality, BUN levels, creatinine serum levels, and administration of furosemide, antibiotics, human albumin, and fresh frozen plasma (ffp).

RESULTS. The 279 patients of group 1 and the 35 patients of group 2 had no differences according to gender, age, APACHE II score, sepsis criteria, BUN and creatinine levels and furosemide administration. The mortality was higher in the second group ($p<0.01$). The administration of antibiotic therapy was not identified as a risk factor of hypernatremia, with the exception of cefuroxime. Cefuroxime as well as human albumin administration seems to be statistically significant prophylactic factor of hypernatremia, while ffp administration and each additional day in the S-ICU setting are statistically significant risk factors of hypernatremia. The following table shows the odds ratios of these factors.

TABLE 1.

Prophylactic and risk factors

	Odds Ratios	p values
Each additional day in ICU	3.14	< 0.01
FFP administration	2.72	< 0.01
Cefuroxime administration	0.73	< 0.01
Human albumin administration	0.20	< 0.01

CONCLUSION. In our study, each additional ICU day as well as the ffp administration seems to increase approximately 3 times the risk of hypernatremia. The administration of one single dose of human albumin and cefuroxime decreases nearly 5 and 1.5 times this risk, respectively.

REFERENCE(S). 1. Polderman K H, Schreuder W O, Strack van Schijndel R J, Thijs L G. Hypernatremia in the intensive care unit: An indicator of quality of care? Crit Care Med 1999;27(6):1041-2.

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0232

ALBUMIN DIALYSIS IN TREATMENT OF ACUTE LIVER FAILURE IN PATIENTS AFTER CARDIOVASCULAR SURGERY

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INTRODUCTION. The ischemic deterioration of liver functions being part of the multiorgan failure syndrome (MOFS), after cardiosurgery is characterized by high mortality level – up to 80%. The opportunity to include the albumin dialysis method, replacing the detoxifying liver function, in the complex intensive therapy, allows to gain time while awaiting the functional recovery of the own organ.

METHODS. We have an experience of 35 procedures in 16 pts. Three of them were operated for congenital heart diseases (body weight range 9 – 47 kg, age range 4 months – 29 years). Other pts suffered from acquired heart diseases (the average body weight 70.6±19.5 kg, the average age 50±14 years).
After the operation all pts developed MOFS, comprising heart (EFLV <40%, epinephrin >0.1 μg/kg/min.), respiratory (PaO2/FiO2<200), renal (80% of pts) and liver failure, the different stage of DIC syndrome. The failure of standart medical therapy applied to liver failure, progressing growth of bilirubin level (total bilirubin is 305.2±120.5 μmol/l), increase of liver ferments value (AST 245±168 U/l, ALT 228±187 U/l, GGT 142±68 U/l), decreasing cholinesterase level (3965±1235 U/l), breach of the hemostasis system (INR – 3.1±1.3, prothrombine index - 37.2±16.4%) and the increasing level of blood ammonia (over 50 μmol/l) became indications for MARS-therapy. The procedure was carried out with MARS device (Gambro, Sweden) combined with the artificial kidney Fresenius 4008B (Fresenius, Germany).

RESULTS. No negative MARS impact on hemodynamics was revealed. In 4 pts were revealed the 10% increase of heart index, the increase of total vascular peripheral resistance for 18% after the albumin dialysis provided the unchanging dosage of inotropic drugs. The MARS-therapy resulted in the decrease of bilirubin level at adult pts, in average by 29.0±3.9% from the preprocedural value, as for children, the decrease reached 57%. All pts demonstrated the possibility to control the level of low molecular water soluble substances (urea 50-60% from initial level). The plasma of 8 out of 10 examined pts showed the reliable growth of cholinesterase concentration 12 hours after MARS procedure. The total survival was 25% (4 out of 16 pts).

CONCLUSION. Our experience suggests that MARS therapy is a perspective method for support of the decompensated liver failure in pts with MOFS after cardiosurgical operations, and can also be safely applied in infants and patients with unstable hemodynamics.

REFERENCE(S). A. EL Banayosy et al, First use of the molecular adsorbent recirculating system technique on patients with hypoxic liver failure after cardiogenic shock. ASAIO Journal 2004;50:332-337.

0233

RECOVERY FROM ACUTE RENAL DYSFUNCTION REQUIRING RENAL REPLACEMENT THERAPY IN SEPTIC SHOCK IN ICU

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INTRODUCTION. Acute renal dysfunction (ARD) in the critical care setting is a frequent condition associated with high morbidity and mortality. The authors evaluate the recovery of ARD requiring Renal Replacement Therapy (RRT) in Septic Shock (SS) patients at discharge from Intensive Care Unit (ICU) and Hospital.

METHODS. Retrospective study on SS Patients with ARD treated with RRT over a 4-year period (2001-2005) in a 8-bed general ICU. ARD was defined on RIFLE criteria according to either GFR/creatinine or urine output. Renal function recovery was assessed by dialysis dependence at discharge from ICU. Data are presented as number or percentage and evaluated with T Student Test.

RESULTS. During the study period 38 Pts with SS and renal dysfunction requiring RRT were evaluated. The media age was 60.76±14.4 years, M:F=27:12, the SAPS II (at admission) and SOFA (at the start of RRT=T0) scores were respectively of 55.2±15 and 12.89±2.8. At T0 all Pts were mechanically ventilated and treated with vasopressors therapy (mean Norepinephrine, Epinephrine and Dopamine were respectively 0.67±0.49, 0.12±0.2 and 1.5±2.6 γ/Kg/min). Pts were assigned to RIFLE categories: Risk n=3, Injury n=8, Failure n=26, End Stage Renal Disease (ESRD) n=2. 18 Pts had preadmission renal dysfunction (n=4 Kidney transplant, n=2 IHD, n=1 CRF). At T0 serum creatinine level was 4.3±2.2 mg/dl and mean diuresis was 31±32 ml/h (at T0 53% of pts were anuric). 27 pts were treated with diuretics. Frusemide was the most common diuretic used (51.3%). RRT (post-dilution CVVH) was performed with a mean dialysis dose of 24.5±7.1 ml/Kg/h and a mean period of 8.7±8.5 days. Low-dose steroids were prescribed in 81%, and only one patient was treated with Activated Protein C. The average length of ICU stay was 23.7±20.5 days, and the mean ventilation time was 19.6±16.8 days. In these SS critically-ill Patients with ARD treated with RRT, recovery from renal dysfunction at discharge from ICU had an occurrence rate of 78% in survivors. At discharge from ICU serum creatinine level were significantly reduced from T0 (2.43±1.4 mg/dl $p<0.05$). At discharge from Hospital, excluding PTS with ESRD, renal function recovery rise to 82% with a mean creatinine level of 1.7±1.1mg/dl. In this ARD-SS population ICU mortality was 28% as the Hospital one. Patients in the more severe RIFLE category Failure had a ICU mortality of 30% compared with 25% for those in the Rifle Injury category and O% for RIFLE Risk pts.

CONCLUSION. In our study ARD mortality in SS Patients was significantly less then expected.

0234

A PATIENT MONITORING DATA ELECTRONIC SYSTEM - ASSESSMENT OF USER'S EXPECTATIONS IN AN ICU

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INTRODUCTION. Work on an ICU demands an extensive recording of clinical data. Patient monitoring data electronic systems (PMDES) must adapt to users and UCI environment in order to succeed. Evaluating user's degree of satisfaction with the PMDES can be a valuable indicator of how it accomplishes UCI needs. This work aimed to evaluate, through a prospective cohort study, whether a PMDES (PICIS CareSuite v6.3), fulfills user's expectations before its implementation.

METHODS. A pre and post analysis of expectations was carried out through a questionnaire. ICU's physicians and nurses were the population evaluated. Before full implementation of the electronic system the pre questionnaire was applied. After 3 months of complete use, the post questionnaire was undertaken. Each questionnaire, with both multiple choice and open questions, had 3 major parts: 1) demographic data 2) feasibility of input and review 3) performance and quality.

RESULTS. Most answers considered that recording data was moderately simple and fast (75.8% pre and 96.3% post). When we consider also prescription there were less favorable answers on the pre assessment (54.5%), but it improved after 3 month's experience (81.5%). Most users think that consulting the system is slow and difficult or just moderately simple. In the pre period 72.7% consider the system better than handwritten files, but after 3 months negative answers raised to 37%. Principal advantages found were limitation of errors and easier use of protocols. Most users won't change again to manual charting (59.3%).

TABLE 1.

	Pre-questionnaire	Post-questionnaire
Number of answers	33 (66%) (doctors–10; nurses-23)	27 (48%) (doctors- 9; nurses-18)

CONCLUSION. Although being a subjective evaluation this study points out interesting features in need of further investigation: 1) Low percentage of answers, eventually meaning a low level of motivation about this issue 2) Therapy prescription easier than expected initially 3) Main problems expected and felt when reviewing data, maybe the main weakness of this system 4) Overall perceived advantage of PDMES over traditional paper charting.

REFERENCE(S). 1. Fraenkel D et al, Quality benefits of an intensive care clinical information system, Crit Care Med, 31: 121-125, 2003.

0235

MONITORING TECHNOLOGY FOR REPAIR OF THORACIC AORTIC ANEURYSM

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INTRODUCTION. The objective of surgical repair of a thoracoabdominal aortic aneurysm (TAAA) is to replace the diseased aorta without compromising the viability of the spinal cord. The most common etiology of TAAA is atherosclerosis and the typical patient is elderly with multiple coexisting diseases. Different approaches for the management of intercostal and lumbar arteries and monitoring of spinal cord integrity during repair of TAAA exist, but the ideal strategy remains to be demonstrated.

METHODS. During the period 10/2002 - 12/2004, 100 patients (age 63.5 $\pm$ 13.5 years) underwent elective TAAA repair with intraoperative monitoring of motor (MEP) and somatosensory evoked potentials (SSEP) in our institution. An average of 8.0 $\pm$ 2.6 segmental artery pairs were sacrificed overall, with an average of 4.5 $\pm$ 2.1 segmental pairs sacrificed between T7 and L1, where the artery of Adamkiewicz is presumed to arise. At surgical preference, an anesthetic management strategy without inhaled agents or muscle relaxants was employed that does not interfere with MEPs or SSEPs. One lung ventilation, mild hypothermia, distal perfusion, high-dose steroids, antifibrinolytics and cerebrospinal fluid (CSF) drainage were employed in all cases. CSF drainage was discontinued once lower extremity function was demonstrated to be normal.

RESULTS. Hospital mortality was 6%. The average CICU stay was 4.3 days and mean hospital stay 16 days. There was no reported intraoperative recall and no patient exhibited movement during their procedure. In 99 cases, MEPs and SSEPs remained unchanged during the course of serial segmental artery sacrifice, or could be returned to baseline levels by manipulation of the blood pressure. Postoperative paraplegia occurred in only two patients. After normal function of lower extremities, the drainage of CSF was terminated.

CONCLUSION. Monitoring of MEPs and SSEPs appears to add to the safety of TAAA repair. Omission of potent volatile inhaled agents and muscle relaxants from the anesthetic technique is compatible with an adequate anesthetic state and a motionless surgical field.

REFERENCE(S).
Jacobs M J, Mess W, Mochtar B, et al: The value of motor evoked potentials in reducing paraplegia during thoracoabdominal aneurysm repair. J Vasc Surg 43:299,2006.

0236

CONTINUOUS SUBCUTANEOUS GLUCOSE MONITORING IN CRITICALLY ILL PATIENTS: ACCURATE AND FEASIBLE?

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INTRODUCTION. An accurate and feasible bedside glucometry method is essential to obtain tight glucose regulation. We evaluated the reliability of the subcutaneous continuous glucose monitoring system (CGMS Gold, Medtronic Minimed) in critically ill patients. An advantage of the CGMS is that no blood has to be drawn from the patient. The CGMS features a subcutanuous sensor that can be used for up to 72 hours. Glucose is measured by the glucose-oxidase method; interstitial glucose measurements are sent to a monitor which records an average glucose value every 5 minutes (range of 2.2-22.2 mmol/l (40-400mg/dl)). The study was performed as a single-center, prospective, observational study in a 12-bed Medical Intensive Care Unit of a University Hospital.

METHODS. The CGMS sensor was inserted in the abdominal subcutis and calibrated every 6 hr. Glucose data were downloaded after 24-72 hr. Furthermore, heparinized arterial bloodsamples were drawn from an arterial line every 4 hours and analyzed on the blood gas/blood glucose analyzer ABL715 (Radiometer Medical; previously we validated this analyzer in ICU patients). The results of the paired measurements were analyzed as a scatter plot, by the method of Bland and Altman and were expressed as a correlation coefficient.

RESULTS. 60 patients were included. 786 paired readings were analyzed. Subcutaneous glucometry provided an acceptable estimate of blood glucose assessment compared to the ABL 715: the correlation coefficient was 0.87; in the Clarke error grid 100% of the paired measurements were in the clinically acceptable zones A & B.

CONCLUSION. The CGMS Gold is reliable and easy to use in critically ill patients. However, this version of the CGMS is not yet useful for tight glucose regulation, since it provides no on-line glucose data (the next version will).

0237

LOWFREQUENCY HAEMOVISCOELASTOGRAPHY - NEW METHOD DIAGNOSTICS COAGULATION DISORDERS AFTER SURGERY

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INTRODUCTION. Venous thromboembolism is one of the most common complications seen in cancer patients and may be due to the hypercoagulalable state of malignancy and to it's surgical treatment.

METHODS. Patients received MEDNORD (Ukraine Co analyser) analysis (HVG), a viscoelastic test, measures clot formation and includes information on the cellular, as well as the plasmatic coagulation system. A complete coaguation screen, activated clotting time (ACT), thromboelasthgraphy (TEG) and haemoviscoelastography (HVG) were performed before surgery, at the end of surgery, and on postoperative days 1, 2, 3, and 7; they were analyzed for the reaction time and the maximal amplitude (MA). We tested the hypothesis that the parallel use of standard TEG and HVG can assess postoperative hypercoagulability and can estimate the independent contribution of procoagulatory proteins and platelets.

RESULTS. We calculated the elastic shear modulus of standard MA (Gt) and HVG MA (GH), which reflect total clot strength and procoagulatory protein component, respectively. The difference was an estimate of the platelet component (Gp). There was a 14% perioperative increase of standard MA, corresponding to a 48% increase of Gt ($P < 0.05$) and an 80%-86% contribution of the calculated Gp to Gt. We conclude that serial standard thromboelastography and HVG viscoelastic test may reveal the independent contribution of platelets and procoagulatory proteins to clot strength. Using multiple linear regression, all coagulation, TEG and HVG variabities were used to model postoperative hypercoagulation. Results showed that some components of the TEG failed to identify hypercoagulation ($r < 0,2$, $P > 0,75$). However, three components of the routine coagulation assay, including bleeding time, prothrombin time, and platelet count could be modeled to show prolonged postoperative hypercoagulability ($P < 0,01$). We conclude that all components of the HVG test reflect postoperative coagulopaties, these results suggests that it may be usefull in determining the coagulation status of cancer patients perioperatively.

CONCLUSION. Postoperative hypercoagulability, occurring for at least 1 week after major cancer abdominal surgery, may be demonstrated HVG viscoelastotest. This hypercoagulability is not reflected completely by standard coagulation monitoring and TEG and seems to be predominantly caused by increased platelet reactivity. HVG viscoelastotest provides a fast and easy to perform bedside test to quantify in vitro hemocoagulation.

0238

DEFINITION OF REGIONS OF INTEREST FOR EVALUATION OF REGIONAL LUNG VENTILATION BY EIT

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INTRODUCTION. The measurement of regional lung ventilation by electrical impedance tomography (EIT) has been evaluated in many experimental studies (1,2). However, EIT is not routinely used in a clinical setting which is attributable to the fact that a convenient concept how to quantify the EIT data is missing. The definition of region of interest (ROI) is an essential point in the data analysis. To date, there are only limited data available on the different approaches to ROI definition to evaluate regional lung ventilation by EIT.

METHODS. For this survey we examined ten patients (mean age ± SD: 60 ± 10 years) under controlled ventilation. The EIT examinations were performed with the Goe-MF II EIT device (Viasys Healthcare, Höchberg, Germany). Sixteen self-adhesive electrodes (3M Red Dot 2239, 3M Health Care, Borken, Germany) were applied on the chest circumference in one transverse plane and used for rotating electrical current injection and voltage measurement. The EIT data were acquired at a rate of 13 scans/s during a 60-s time interval. Regional tidal volumes were quantified as pixel values of inspiratory-to-expiratory differences in relative impedance change and four types of ROIs were subsequently applied. The definition of ROI contours was based on the calculation of the pixel values of 1) standard deviation from each pixel set of impedance data and 2) regression coefficient from linear regression equations between the individual local (pixel) and average (whole scan) impedance signals. Additionally, arbitrary ROIs (four quadrants and four anterioposterior segments of equal height) were used.

RESULTS. In all 10 patients, good quality EIT data were acquired and the functional EIT scans clearly visualised the ventilated lung regions. No significant differences between the quantitative analyses of regional lung ventilation using the two functional approaches to ROI definition were found. Our results indicate that both approaches to ROI definition using functional statistical parameters are suitable when impedance signals with high sensitivity to ventilation-related phenomena are to be analyzed. The simple arbitrary ROIs may be combined with the functional ROIs.

CONCLUSION. The definition of the ROI contour as 20%-35% of the maximum standard deviation or regression coefficient is recommended. The simple segmental ROIs are less convenient because of the low ventilation-related signal component in the dorsal region.

REFERENCE(S). (1) Frerichs et al. J Appl Physiol 2002, 93, 660-6.
(2) Hinz et al. Chest 2003, 124, 314-22.
(3) Victorino et al. Am J Respir Crit Care Med 2004, 169, 791-800.

0239

VIBRATION RESPONSE IMAGING DEPICTS EFFECTIVENESS OF INCENTIVE SPIROMETRY

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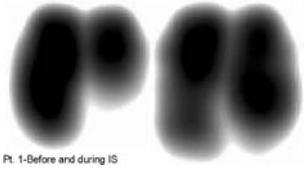
INTRODUCTION. Vibration response imaging (VRI) is a novel technology that measures vibration energy generated from airflow to create a real-time structural and functional image of the respiration process. Sophisticated software and surface skin sensors are placed on the back to record, analyze and display vibrations as a non-invasive measure of airflow in the lung.

METHODS. We performed VRI in two patients during tidal breathing and immediately thereafter during incentive spirometry (IS). One patient was recently extubated following hemoptysis associated acute respiratory failure (Fig. 1) and the second patient was admitted with acute non-Q wave myocardial infarction (not shown). In both circumstances, the left lower lung field was poorly ventilated during tidal ventilation.

RESULTS. Incentive spirometry produced a striking increase in ventilation fo the left lower lung.



Pt. 1-Before and during IS

CONCLUSION. The current incentive for incentive spirometry is patient recognition of achieved tidal volume goal. These two cases highlight the potential utility of VRI as a non-invasive, bedside reinforcement tool in which reversal of atelectasis would be the feedback target.

0240

INFLUENCE OF VENTILATOR SETTING ON PATIENT-VENTILATOR SYNCHRONY WITH DIFFERENT INTERFACES.

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INTRODUCTION. Patient-ventilator synchrony is strongly dependent on both the ventilator settings and the interface used to apply positive pressure to the airway. The aim of this bench study is to compare three different interfaces for mechanical ventilation, the endotracheal tube (ET) the facial mask (FM) and the helmet (H) during Pressure Support Ventilation (PSV) delivered with different rates of pressurization (Timepress) and expiratory trigger (Trexp).

METHODS. PSV (inspiratory support 12cmH2O, PEEP 5cmH2O) was delivered to an head manikin, connected to a test lung (ASL 5000, IngmarMedical) with an ET, a face-mask and an helmet. We tested 3 Respiratory Rate (RR) (14, 20 and 30 breaths/min) and two ventilatory settings (Timepress 50%-Trexp 25% and Timepress 80%- Trexp 60%), applied in random order. All the data are expressed as Mean ± SD. The analysis of variance for repeated measures was performed with ANOVA test. P values lower than 0.05 were considered statistically significant.

RESULTS. The analysis of patient-ventilator interaction shows that the synchrony was significantly better with the ET than with the mask and the helmet, as shown by inspiratory trigger delay (Delaytrinsp) ($p<0.001$) and time of assistance as well ($p<0.001$). At high RR and Timepress 50%-Trexp 25% patient-ventilator interaction was poor with all three interfaces, as shown by the percentage of wasted effort (WE) (20% during ET versus 33% during mask versus 50% during helmet); WE percentage was significantly reduced during Timepress 80%-Trexp 60% ($p<0.05$). Compared to Timepress 50%-Trexp 25%, at high RR (30 breath/min) Timepress 80%-Trexp 60% caused a si gnificant decrease in Delaytrinsp and a concomitant increase in time of assistance ($p<0.001$ and $p<0.05$, respectively) with all the three interfaces.

CONCLUSION. Our experimental model shows that both the interface and the ventilator setting affect patient-ventilator interaction. Especially at high RR, where the probability of dys-synchrony is elevated with all the interfaces, the proper ventilator setting may significantly improve synchrony.

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0241

DIFFERENCES BETWEEN PATIENTS MONITORED WITH ESOPHAGEAL DOPPLER AND PULMONARY ARTERY CATHETER

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INTRODUCTION. The knowledge of the hemodynamic status in a critical care patient is as important as the whole Intensive Care Medicine. The pulmonary artery catheter (PAC) has been used for 30 years but questions about safer methods arised. Some minimally invasive methods as the esophageal doppler (ED) appeared as alternative and safer tools. However, there are few data about differences between patients using PAC and the new methods.

METHODS. From August 2002 to December 2005 we included all patients admitted in our Medical and Surgical ICU (total 26 beds) and use of hemodinamic monitoring - ED (Cardio Q, Dextel, UK) or PAC (Vigilance, Edwards LifeSciences, USA). We conducted a retrospective cohort using the data bank Quati (Dixtal, Brasil). Two groups were made (ED and PAC) for comparision.

RESULTS. In this period 5835 patients were admitted in our ICU and 410 (7%) fulfilled the criteria. 33 patients were excluded because the usage of both methods. 125 patients used ED and 253 PAC.

TABLE 1.
Results

	AGE (years)	APACHE II	Mortality	ICU days	MV days	Renal Suport	Sepsis (admission)
Esophageal Doppler	70.4±16.4	19 ±6.9	43.2%	11.7 (14.5-3400)	6.3 (0-118)	35.2%	30.4%
Pulmonary A CAtheter	66.1±17.5	16 ±5.8	33.6%	14.7 (1.6-3329)	8.7 (0-87.1)	37.2%	22.1%
p	0.008	<0.001	NS	NS	NS	NS	NS

CONCLUSION. ED patients are older and sicker than the PAC patients.
The population of monitored patients has severe medical conditions, high renal suport use and mortality.
No conclusion should be done about the type of hemodinamic monitoring and mortality.

0242

HETEROTOPIC OSSIFICATION OF THE KNEE JOINT IN ICU PATIENTS: EARLY DIAGNOSIS WITH MRI

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INTRODUCTION. Heterotopic ossification (HO) of the para-articular tissues is a potential complication in intensive care unit (ICU) patients. The purpose of our study was to evaluate the MRI findings upon clinical suspicion of HO in the knee joint of patients hospitalized in the ICU.

METHODS. We report on the early MRI findings of HO of the knee joint in 10 patients hospitalized in the ICU for CNS trauma (6 patients), necrotizing pancreatitis (1 patient) and fat embolism (1 patient). Upon clinical and laboratory suspicion for HO, conventional radiographs (CR) and MRI of the knee was performed (19.9±7.4 days after admission).

RESULTS. CR were negative, while MRI depicted joint effusion and a "lacy pattern" of the vastus lateralis and vastus medialis muscles with hyperintense septa interposed among the low signal intensity muscular fibers, on STIR images. Homogeneous high signal was observed at the innermost part of the vastus medialis. Due to enhancement of the intermuscular septa a "lacy pattern" was also observed in contrast enhanced fat suppressed T1-weighted images. On follow-up the lesion was limited at the innermost part of the vastus medialis which showed heterogeneous high signal on STIR and T1-weighted images and homogeneous enhancement after contrast administration. CR depicted a calcified mass confirming the diagnosis of HO in all 10 patients.

CONCLUSION. MRI of the knee performed upon clinical suspicion, shows a distinct imaging pattern that may be useful in the diagnostic work-up of HO patients. Early diagnosis with MRI might present an important advantage, which is to facilitate effective prevention of HO.

REFERENCE(S). 1. Kaplan F S, Glaser D L, Hebela N, Shore E M (2004) Heterotopic ossification. J Am Acad Orthop Surg.12:116-25.
2. Herridge M S, Cheung A M, Tansey C M, Matte-Martyn A, Diaz-Granados N, Al-Saidi F, Cooper A B, Guest C B, Mazer D, Mehta S, et al (2003). One-year outcomes in survivors of the acute respiratory distress syndrome. N Engl J Med; 348:683-693.

0243

IMPROVEMENT OF HUMIDIFICATION PERFORMANCES WITH NEW HEATED HUMIDIFIERS

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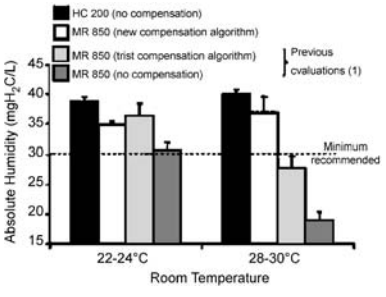
INTRODUCTION. Heated Humidifiers (HH) with heated wire have been shown to deliver absolute humidity levels as low as 20mgH2O/L in situations of high ambient temperature and/or using turbine ventilators (1), which can lead to severe adverse effects. The aim of the study was to evaluate two new devices designed to avoid such pitfalls.

METHODS. We measured on bench hygrometry (psychrometric method) of new HH (HC 200, Grundler medical) and HH with new compensation algorithm (MR850, Fisher&Paykel) in different situations of room temperature and ventilator setting.

RESULTS.



CONCLUSION. New tested HH showed better humidification performances and were not influenced by room temperature.

REFERENCE(S). (1) Lellouche et al. AJRCCM 2004. 170:1073-1079

Grant acknowledgement. Grundler medical, Fisher&Paykell

0244

EVALUATION OF A NEW ARTERIAL PRESSURE-BASED CARDIAC OUTPUT DEVICE REQUIRING NO CALIBRATION

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INTRODUCTION. Several techniques have been discussed as alternatives to the intermittent bolus thermodilution cardiac output (CO_{PAC}) measurement by the pulmonary artery catheter (PAC). However, these techniques usually require a central venous line, an additional catheter, or a special calibration procedure. A new arterial pressure-based cardiac output (CO_{AP}) device (FloTrac™, Vigileo™; Edwards Lifesciences, Irvine, CA, USA) only requires access to the radial or femoral artery using a standard arterial catheter and does not need an external calibration [1]. We validated this technique in critically ill patients in the intensive care unit (ICU) using CO_{PAC} as the method of reference.

METHODS. After obtaining approval of the Institutional Ethics Committee, we studied 20 critically ill patients (10 male), aged 16 to 74 years (mean, 55.5±18.8 years), who required both arterial and pulmonary artery pressure monitoring. CO_{PAC} measurements were performed at least every 4 hours and calculated as the average of 3 measurements randomly distributed over the respiratory cycle, while CO_{AP} values were taken immediately at the end of bolus determinations. Accuracy of measurements was assessed by calculating the bias, precision and limits of agreement using the method described by Bland and Altman [2].

RESULTS. A total of 167 coupled measurements were obtained. Absolute values of CO_{PAC} ranged from 2.80 to 10.80 L/min (mean 5.95±1.58 L/min). The bias between CO_{PAC} and CO_{AP} was -0.002 L/min±1.38 L/min with limits of agreement (2SD of the bias) of ±2.76 L/min.

CONCLUSION. The CO_{AP} algorithm shows a minimal bias with CO_{PAC} over a wide range of values in an inhomogeneous group of critically ill patients. The relative wide scattering of the data may partly be explained by the calculation mode with which the algorithm compensates for slow changes in vascular resistance using a 10 minute moving average. This method may have difficulty responding to rapid changes in vascular tone during haemodynamic instability. Improvement regarding the response time to changes in vascular tone should enhance the accuracy of CO_{AP} determination and this has been addressed in a subsequent version of the software.
Our data suggest that FloTrac™ system is a promising alternative for cardiac output assessment and provides an acceptable accuracy for clinical decision making in an ICU setting.

REFERENCE(S). 1. Manecke G R. Edwards FloTrac™ sensor and Vigileo™ monitor: easy, accurate, reliable cardiac output assessment using the arterial pulse wave. Expert Rev Med Devices 2005; 2: 523-7.
2. Bland J M, Altman D G. Measuring agreement in method comparison studies. Stat Methods Med Res 1999; 8:135-60.

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0245

ADVANTAGE AND DISADVANTAGE OF ECHOCARDIOGRAPHY IN CRITICAL ILL PATIENTS

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INTRODUCTION. The echocardiography in critical illl patient is used like bedside imaging technique for a rapid control of the cardiovascular system. The aim of this report is review the utility of the transthoracic (TTE) and transesophageal (TOE) echocardiography.

METHODS. We make 280 random echocardiographies studies (213 TTE and 67 TOE) in the period of six months to 216 patients admitted to polyvalent intensive care unit (ICU) with 24 beds. The studies were realized with a Phillips 5000 echocardiography: harmonic transducer S3 for TTE and TS6HC transducer for TOE. A descriptive study was performed for analyse the profitability diagnostic, adopt therapeutic decisions with the two echocardiography modalities (TTE and TOE) and the quality of the images in both studies. Profitability diagnostic: reject or confirm.

RESULTS. The population of study were composed of: 74.5% medical pathology, 21% traumatic patients, 4% cardiology pathology y 0.5% surgery patients. The quality of images studies were good in 63 TOE and 179 TTE (94% and 84% respectively). The profitability diagnostic in the TOE was 86.5% (corroborated 34.3%; rejected 52.5%) and 62% in the TTE (corroborated 25.8%; rejected 36.2%). The reasons to realize the echocardiography in the patients were: Fever / bacteriemia in the 36.4% cases, 15.7% respiratory failure, 6% hemodynamic monitoring and 7% thoracic injury. The therapeutic management changed according to the result in the 34.3% of the TOE and 27.2% of the TTE.

CONCLUSION. We observed a more quality in the images obtained with the TOR than TTE, but the TTE has a good profitability diagnostic. In the 27% of TTE and 35% of TOE are useful for the therapeutic management. The 56% of TTE were a good technique for hemodynamic monitoring.

REFERENCE(S). Heart 2005; 91:541-547. Crit Care Resusc 1999; 1(3): 296-310

Grant acknowledgement. University Hospital Juan Canalejo

Poster Sessions
Pulmonary oedema and haemodynamics
0246-0255

0246

ROLES OF ACTINS ON LUNG EDEMA AND INFLAMMATION ON RAT LUNG TISSUE

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INTRODUCTION. To explore the roles of actins on lung edema and inflammation in rat lung tissues.

METHODS. SD rats were divided into three groups: control group was injected saline intra right cardiac ventricle, the other two groups of rats were pretreated before 0.5 h experiments begun with injection of cytochalasin D (Cyto D) 0.5mg/kg or phalloidin (Ph) 0.5mg/kg by intra right cardiac ventricle. All the animals were observed 6 hours. Lung wet/dry ratio (W/D) was used to measure the lung edema.125I-labeled albumin was used as a tracer to measure the pulmonary epithelial permeability (PEP), transmission electron microscopy used as to observe the change of actins, reverse transcribed polymerase chain reaction to measure the tumor necrosis factor (TNF)-a mRNA, Western blotting to detect expression of occludin in lung tissue which is the one of composite protein of tight junctions (TJ).

RESULTS. Compared with the control group, the W/D and PEP increased in group treated by cytochalasin D as well as the actins were disrupted. The expression of occludin decreased in the lung tissue. There was no difference between the phalloidin group and the control group of lung W/D, but PEP increased in group of phalloidin. Compared to the control group, the expression of TNF-a increased significantly in the group of Cyto D, but there was no difference between phalloidin group and control group. The expression of occludin decreased in the lung tissue treated by cytochalasin compared with control group but there was no difference between control and phalloidin.

CONCLUSION. The actins may play an important role in lung edema and inflammation. Disruption of actins would increase pulmonary epithelial permeability via destroy tight junctions, also it would induce pulmonary inflammations.

REFERENCE(S). 1. Dudek S M, Garcia J G. Cytoskeletal regulation of pulmonary vascular permeability. J Appl Physiol, 2001, 91: 1487-500.

0247

INCIDENCE OF DIASTOLIC DYSFUNCTION IN ACUTE RESPIRATORY FAILURE REQUIRING MECHANICAL VENTILATION

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INTRODUCTION. Diastolic anomalies appear before signs of systolic dysfunction in most pathologies (Samain. E. SFAR 1999; 571-588). The aim of this study is to analyse the incidence of diastolic dysfunction in polyvalent intensive care patients with acute respiratory failure (ARF) requiring mechanical ventilation.

METHODS. An open observational prospective study, including 24 patients with ARF. Transoesophageal cardiac ultrasound exam was performed in all patients, with analysis of systolic and diastolic ventricular function according to Appleton's method (Appleton JACC 1988; 12:426-40). Neuromuscular and central causes of ARF were excluded.

RESULTS. Mean age was 61± 9 years (36 to 86 ans). The main cause of ARF was hemodynamic (n= 16). Diastolic dysfunction was noted in 11 patients (45%), it was the only one trouble detected in 3 patients (12%). Five patients had a trouble of relaxation, 6 others had trouble of the compliance.

CONCLUSION. Diastolic dysfunction is common in patients with ARF. Nevertheless it remains difficult to diagnose because it is influenced by the load conditions of the heart. The current new means of monitoring, particularly the tissue-Doppler allow to a more precise approach. The diagnosis of diastolic dysfunction could lead to change therapeutic measures and make them more adapted.

REFERENCE(S). Samain. E. SFAR 1999; 571-588.
Appleton JACC 1988; 12:426-40.

0248

POSITIVE END-EXPIRATORY PRESSURE INCREASES THE PULMONARY EDEMA CLEARANCE

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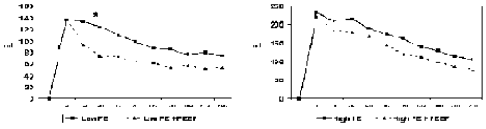
INTRODUCTION. Our objectives are to analyze if the clearance of pulmonary edema (PE) depends of the intensity of the edema and to know if the application of PEEP increases or not this clearance rate.

METHODS. Experimental study on 25 pigs weighing 30±3 kg, anaesthetized and in mechanical ventilation during 4 hours with tidal volume of 10 ml/kg, respiratory rate of 20 per min and FiO_2 of 0.6. Four experimental groups, combining two levels of PE with or without PEEP, were studied. Group Low PE (n=10): PE was produced with 4 ml of intratracheal saline solution (ss). Group Low PE+PEEP (n=5): the same as the previous but PEEP of 10 cm H_2O were added. Group High PE (n=5): 10 ml/kg of ss were instilled intratracheally. Group High PE+PEEP (n=5): the same as the previous but PEEP of 10 cmH_2O were added. Extravascular lung water (EVLW) was determined using the PiCCO system (Pulsion, Germany). EVLW, blood gas exchange and respiratory parameters were determined every 30 min during 4 hours. Mann-Whitney test was used for quantitative variables and a $p<0.05$ was considered statistically significant.

RESULTS. In absence of PEEP, the clearance rate in the 2 first hours was similar in groups of Low and High PE (22.6 ml/h and 35.3 ml/h, p=NS). During the 3th and 4th hours the clearance decreases in Low PE group (5 ml/h vs 32 ml/h, $p<0.005$). The application of PEEP in group of Low PE originates a sharp and significant increases of PE clearance (at 30 min, 11±17 ml vs 63±36 ml, $p<0.05$) (see Figure). In group High PE + PEEP there are non statistically significant differences.



CONCLUSION. During the first 2 hours, the clearance of PE does not depend of the intensity of the edema. The low clearance rate during 3th and 4th hours in the Low PE group indicates that the PE is practically resolved. The application of PEEP increases the PE clearance early, in particular in low levels of PE.

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0249

QUANTITATIVE DEFINITION OF ACUTE PULMONARY EDEMA BY EXTRAVASCULAR LUNG WATER

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INTRODUCTION. Acute pulmonary edema is one of the most common problems in critically ill patients and has a great effect on the outcome. Although the pathological change of pulmonary edema is the accumulation of fluid in the lungs, it has never been clearly defined quantitatively. It is known that extravascular lung water (EVLW) estimated by the PiCCO system (Pulsion Medical Systems) correlates closely with gravimetric measurements of lungs in experimental animal models [1]. It is also demonstrated that EVLW correlated well with oxygenation in ALI/ARDS patients in septic shock and prognosis in critically ill patients [2,3]. Thus, the aim of the present study was to define acute pulmonary edema quantitatively by EVLW using the PiCCO system.

METHODS. All 75 patients who had a central venous catheter and a thermistor-tipped arterial thermodilution catheter (PiCCO system) for hemodynamic management treated in three hospitals between July 2004 and January 2006 were included. The correlation between PaO2/FiO2 ratio and EVLW was evaluated to investigate the relationship between EVLW and oxygenation in patients with pulmonary edema. We also evaluated the relationship between EVLW and postmortem lung weight in eight patients in whom autopsies were carried out within 48 hours after thermodilutional EVLW measurement. To define the pulmonary edema quantitatively, a PaO2/FiO2 ratio of 200 and postmortem lung weight of 27mg/kg was considered as the cutoff value of pulmonary edema according to the literature.

RESULTS. Measurement of EVLW using the PiCCO system was very closely correlated with PaO2/FiO2 ratio (R=-0.57 P<0.001) in patients with pulmonary edema and with gravimetric measurement of lung weight (R=0.93 P=0.002) in humans. From the correlation between EVLW and PaO2/FiO2 ratio, 14ml/kg was derived as the cutoff value for pulmonary edema, and the same value was derived from the correlation between EVLW and lung weight.

CONCLUSION. EVLW of 14ml/kg measured by the PiCCO system may be the quantitative definition of acute pulmonary edema.

REFERENCE(S). 1. R Katzenelson; A Perel et al. Crit Care Med 2004 Vol.32, No.7.
2. T.Szenkmy et al. Anaesth Intensive care 2004; 32:196-201.
3. S Saka et al. CHEST 2002; 122:2080–2086.

0250

PULMONARY EMBOLISM PROGNOSTIC FEATURES

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INTRODUCTION. Pulmonary embolism has multifarious clinical presentations and has been divided into two groups: massive PE, often associated to shocks, and non-massive PE. In between the two extremes there lies a continuum range having different degrees of seriousness, with a rate of death ranging from over 30% in the shock-associated forms, that reduces to 1% in the asymptomatic or paucisymptomatic forms. Right ventricle disfunction is considered a very useful indicator of a serious case, but its assessment is not univocally standardized and not easy to gain in emergency.

METHODS. In a perspective study we examined 125 patients with a pulmonary embolism diagnosis and with a minimum six months follow-up. We assessed survival in relation to age, sex, troponine I, RVD, PE massive/non-massive on a clinical evaluation, COPD, cardiopathy, trombolysis (yes/no), neoplasia (yes/no), shock index (HF/SBP).

RESULTS. Patients' average age was 69.5 years, with a 55.1% percentage of female. Death time pattern in the first month was 15.2%, it decreased to 2.4% in the second month, and 0.8% in the third month from the diagnosis and the difference turned out to be statistically significant for shock index, neoplasia, and troponine I. More specifically, shock index <1 had a 1874 days median and if > o = 1 had a 99 days median (p<0.0001); the presence of neoplasia at the diagnosis had a 166 days median, and in case no neoplasia was present at the diagnosis, the median wasn't reached (p< 0.0001); Troponine I didn't reach the median for values < o = at 0.06 ng/ml and had a 223 days median for values 0.006 ng/ml (p=0.02).

CONCLUSION. Our data highlight a high early death (within one month) and this seems to show that a more aggressive and timely therapeutic approach may improve survival rates. A very useful element to predict the PE disease was the Shock Index, which proved particularly useful in emergency, as it can be easily gained. In our experience RVD assessed by echocardiography was not particularly meaningful, probably because of the inaccuracy in standardization of parameters.

REFERENCE(S). 1) Agnelli G, Becattini C, et al.: A prospective study on cardiovascular events after acute pulmonary embolism. Eur Heart J; 2005; 26:77-83 2) Goldhaber SZ. Echocardiography in the management of pulmonary embolism. Ann Intern Med. 2002; 136: 691-700 3) Kostantinides S, Geibel A, et al.: Importance of cardiac troponins I and T in risk stratification of patients with acute pulmonary embolism. Circulation 2002; 106: 1263-68.

0251

PROGNOSTIC VALUE OF EXTRAVASCULAR LUNG WATER IN MECHANICALLY VENTILATED PATIENTS

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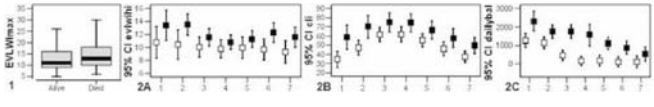
INTRODUCTION. Bedside measurement of extravascular lung water (EVLW) is a more appropriate tool than oxygenation parameters or radiographic techniques for the assessment of pulmonary edema. In this study, we prospectively analyzed the prognostic value of EVLW in critically ill mechanically ventilated (MV) patients.

METHODS. Prospective single center study. So far data analyzed from 97 (59 male) critically ill MV patients treated in 2 ICU's during a 12 month period. Age 64.2±15.4 (28 to 89 years); body mass index 25.7±5.6; SAPS II 50.5±17.6; APACHE II 22±11; SOFA 11±3.8 with 2.4±1.1 organ failures; maximal abdominal pressure (IAP) was 15±4.5. The capillary leak index (CLI) was defined by the CRP over albumin ratio. All patients were hemodynamically monitored by the transpulmonary thermodilution technique. EVLW was calculated using the commercially available PiCCO computer system (Pulsion Medical Systems, Munich, Germany). For each measurement, 20 mL of cooled saline was injected via a central vein.

RESULTS. The baseline EVLW was 11.2±5.8 ml/kg, the highest during the day was 12.7±6.5 and the maximal during the first week was 14.1±6.2. Maximal EVLW was significantly higher in nonsurvivors (n =57) than in survivors (n =40) [15.2±6.9 versus 12.6±4.8 respectively; p = 0.04, Fig 1], however the area under the ROC curve was only 0.6. In univariate analysis, only SOFA score (p=0.059) and daily fluid balance (p=0.045) were predictors for mortality. During the first week of ICU stay the EVLW, CLI and daily fluid balance remained higher in nonsurvivors (closed squares, Fig 2 Panel A-C). A biphasic CLI-evolution was observed in all patients, reaching maximal levels by day 3.



CONCLUSION. A low maximal EVLW value correlated well with survival. There seems to be a correlation between positive fluid balance, a high capillary leak index, subsequent increased EVLW and poor prognosis. In our preliminary results, a high EVLW however was not an independent predictor of prognosis. The study will be continued until 150 patients.

0252

HEMODYNAMIC IMPACT OF PROPHYLACTIC PEEP VS NO PEEP IN PERI-INTUBATION: A PILOT STUDY

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INTRODUCTION. Background: The hemodynamic effect of increasing PEEP is well established in mechanically ventilated patients. Decreased venous return; cardiac output and systemic arterial pressures are the physiological consequences of positive lung pressures on the cardiovascular system, including in healthy humans. Multiple factors may further influence the above effect, such as volumic status, sedation, preexistent cardiac dysfunction... Consequently, physicians are often reluctant to setup a PEEP in the peri-intubation period, fearing a deleterious hemodynamic impact which would exceed the potential favorable effect on gas exchanges.
Hypothesis: setting a 5cm H20 (PEEP) vs zero PEEP (ZEEP) in the peri-ntubation period does not significantly affect the hemodynamic status of MICU patients in a peri-intubation period of 90 min and does not influence the outcome.

METHODS. Methods: a prospective one-center interventional blinded randomized pilot trial, including consecutive patients with clinical indication of intubation. The primary objective was a variation of mean arterial pressure (MAP) from baseline up to 90 min post intubation. Secondary issues addressed mean duration of intubation, level of MAP support after intubation, and 28-days mortality. Neither anesthestic procedures nor levels and types of intervention for maintaining MAP after intubation were codified, and all were left to the judgment of the on-duty physician.

RESULTS. Results: 33 consecutive patients were randomized in the ZEEP group and 30 in the PEEP group. Both groups exhibited similar baseline characteristics (ZEEP vs PEEP): age (64±18 vs 65± 14 years), gender 21/33 vs 17males/30, APACHE II score: 19.5±7.6 vs 18.5±5.5, preliminary cardiac dysfunction (LVEF below 40%: 8 vs 10), causes of intubation: cardio-respiratory (17 vs 15), neurologic (8 vs 5), arythmia (5 vs 6), miscellaneous (8 vs 4). Major chronic health problems: cardiac/vascular diseases (25 vs 28), dyslipidemia (12 vs 8), BPCO/asthma (10 vs 8), cancer (9 vs 8), renal failure (5 vs 4). pre-existing hypotension before intubation (9 vs 12). Outcome issues after randomization were: delta MAP form baseline: T0-15min: -2.6±15 vs 1.2±20 mmHg; T15-30min: -5±22 vs 1.5±22mm Hg; T30-60 min: -4.3±22 vs –0.6±20 mmHg; T60-90min: -3.7±18 vs -4±24 mmHg (p>0.05). Mean duration of intubation: 9.2±8.5 vs 9.2±8.8 days (p>0.05). 28-days mortality: 14/33 vs 9/30 (p>0.05). Levels of MAP support after intubation (0 to 4 scale): 0 (2 vs 3); 1 (2 vs 6); 2 (8 vs 7); 3 (17 vs 9); 4 (6 vs 4)(p>0.05).

CONCLUSION. In this clinical pilot trial, there is no evidence that setting a prophylactic PEEP of 5 cm H2O neither adversely affect the short-term hemodynamic status nor the outcome of MICU patients in a peri-intubation period.

0253

EFFECTS OF ISOTONIC OR HYPERTONIC-HYPERONCOTIC RESUSCITATION ON EARLY HEMORRHAGE-INDUCED LUNG INJURY

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INTRODUCTION. The present study compared the effects of isotonic versus hypertonic-hyperoncotic resuscitation on pulmonary edema and histological injury induced by a severe hemorrhage in a pig model.

METHODS. 19 pigs (43 ± 4 kg) were anesthetized, ventilated and randomized in 3 groups: without hemorrhage (n=5), hemorrhage group resuscitated with 0.9% NaCl (NS group, n=7) or hemorrhage group resuscitated with a solution of 7.2% NaCl / 6% hydroxyethylstarch 200/0.5 (Hyperhes, Fresenius)(HSHES group, n = 7). The protocol consisted into five periods: hemorrhagic shock during 2 hours (MAP<40 mmHg and cardiac index < 60% of baseline and SVO2<30%), resuscitation during 2 hours (2 ml/kg/min of NS or 4 ml/kg of HSHES in 10 minutes followed by an infusion of 0.2 ml/kg/min of HSHES in order to obtain a CI of 90% of baseline and a SVO2 of 50%), 1h of transfusion (Hb> 80% of baseline) and 1 hour of observation. After euthanasia, extravascular lung water (EVLW) was measured by gravimetry and histological score was determined on lung biopsies.

RESULTS. The volume of removed blood was 37±6 ml/kg in the NS group and 39±3 ml/kg in the HSHES group. Resuscitation endpoints were achieved in similar times with 90±17 ml/kg of NS (34±4g of Na) and 6.8±1.9 ml/kg of HSHES (20±5 g Na). CI, SVO2, oxygen delivery, and blood lactate were not different between loading strategies during the whole protocol. Hemorrhage induced an increase in EVLW which was independent of the resuscitation strategy (9.7±1.8ml/Kg in NS group vs 9.2±1.4 ml/kg in HSHES group and 6.4±1 ml/kg in control group, p<0.05 vs control). The degree of alveolar membrane focal thickening and the degree of interstitial neutrophil infiltration were significantly more severe in the hemorrhage groups without effect of the type of fluid loading. Hemorrhage did not induce hypoxemia or alveolar injury but increased indexed pulmonary resistances (488±143 vs 233±32 dyne.sec.cm-5.m2 at baseline). A pulmonary hypertension occurred after resuscitation in the NS group but not in the HSHES group (MPAP= 23±4 mmHg in NS group vs 15±5 mmHg in HSHES group (p<0.05) and 12±1 mmHg in control group (p<0.05)).

CONCLUSION. Despite a very negative fluid balance, small-volume resuscitation did not attenuate early hemorrhage-induced pulmonary edema and interstitial histological injuries. These results do not promote the use of a small-volume resuscitation as a strategy aiming at limiting early hemorrhage-induced pulmonary edema.

0254

INFUSION OF 6% HES 130/0.4 AND EXTRAVASCULAR LUNG WATER IN PATIENTS WITH ACUTE LUNG INJURY (ALI)

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INTRODUCTION. The aim of the study was to determine criteria of safety volume replacement therapy with 6% HES 130/0,4 9:1 (6% HES) in pts with ALI.

METHODS. We examined 20 pts in the intensive care unit with different hematological malignancies complicated by sepsis, septic shock and ALI. They received volume replacement therapy with 6% HES. Before and after the protocol, we recorded PAWP by Swan-Ganz catheter, extravascular lung water index (ELWI) and pulmonary vascular permeability index (PVPI) - by single transpulmonary thermodilution and colloid-osmotic pressure (COP). Infusion has a constant velocity (750ml/h) with target PAWP +25% from beginning value.

RESULTS. The volume of 6% HES infusions was 14.4±5 ml/kg. There was no change in COP. The PAWP-COP gradient increased from -7.8±3 up to -3.5±3.4 mmHg. Most of the pts (16) showed no changes in ELWI (15.5±6.7 and 15.6±7 ml/kg). The ELWI after infusion increased significantly by 8±3 ml/kg in 4 pts. In three of the four pts there was a remarkable increase of PAWP-COP gradient after infusion up to 5.3±2.5 mmHg. The fourth pt before infusion had significantly more raised PVPI up to 9.2 than the others (3.5±1.8, maximum 5.1).

CONCLUSION. 1) High risk group of ELWI increase after 6% HES infusions is that of pts with gradient PAWP- COP before infusion ≥0 mmHg. 2) Increases in ELWI after 6% HES infusions can be observed in pts with remarkable amount in PVPI (higher than 5).

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0255

CONTINUOUS POSITIVE AIRWAY PRESSURE WITH HELIUM IN CARDIOGENIC PULMONARY OEDEMA

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INTRODUCTION. It is well known that the use of continuous positive airway pressure (CPAP) in patients with cardiogenic pulmonary oedema (CPO) decreases the Incidence of intubation (Ii) and improves survival (1). We hypothesise that the adjunction of Heliox (He: Helium 80/20%) with CPAP could improve oxygen delivery more rapidly and reduce the invasive ventilation needs in CPO patients thus reducing myocardial stress.

METHODS. A prospective, randomized clinical trial in our Intensive Care Unit was conducted by enrolling 20 patients who were admitted with CPO as diagnosed by Chest X-ray. Patients were randomized to receive either CPAP (G1=20) or CPAP+He (8l/min) (G2=20) after family consent. We noted the time necessary to recover an arterial oxygen saturation (SaO(2)) above 97% without invasive ventilation. Age and gender were not different between the two groups. An Electro-cardiograms was performed in each patient. Plasma troponine levels were also measured in all the patients in order to detect acute myocardial infarction (AMI).

RESULTS. The Ii in G2 was 20% (n=4) as compared to a rate of 40% (n=8) in G1. The incidence of AMI 10% (n=2) in G2 and 30% (n=6) in G1 ($p<0.05$). The increase of AMI rate was found to correlate with the incidence of Ii ($p<0.05$). CPAP could be stopped after 54 minutes (+/-6 SD) in G1 as compared to 38 min (+/-6 SD) in G2 ($p=0.02$). Heart rate, systolic blood pressure, diastolic blood pressure, respiratory rate and pulse oximetry all did not differ significantly between both groups, nor did arterial pH, pCO(2) and pO(2).

CONCLUSION. CPAP appeared to be an effective mode of therapy in CPO, diminishing risk of intubation and thus reducing myocardial stress factors which potentially could lead to an AMI. The rapid efficacy of CPAP with Heliox in acute CPO seems to indicate it's superiority to conventional CPAP.

REFERENCE(S). 1 R Agarwal, A N Aggarwal, D Gupta and S K Jindal"Non-invasive ventilation in acute cardiogenic pulmonary oedema" Postgraduate Medical Journal 2005;81:637-643.

Poster Sessions
Basic research in sepsis (I): Pathophysiology 0256-0269

0256

EXPRESSION OF PROCOAGULANT MOLECULES AND PARS IN RATS WITH LPS-INDUCED LIVER INJURY

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INTRODUCTION. The importance of interaction between inflammation and coagulation in tissue injury and organ dysfunction during sepsis is well established, but the role of protease-activated receptors (PARs) and its relationship with factors involved in this process is unclear.

METHODS. ear. In the present study, we examined time-course expression and distribution pattern of tumor necrosis factor-alpha (TNF), tissue factor, plasminogen activator inhibitor-1 (PAI-1), fibrin, and PARs 1 to 4 in a rat liver with a lipopolysaccharide (LPS)-induced injury and endotoxemia (ip, 15 mg/kg LPS).

RESULTS. 15 mg/kg LPS). LPS-treated rats had decreased blood pressure, increased level of bilirubin and alanine aminotransferase (ALT), indicating endotoxemia and hepatocellular damage, a finding that was also confirmed by histopathologically. A sharp and significant elevation of TNF expression, an hour after LPS administration, was followed by increases in levels of tissue factor, PAI-1, and a time-dependent expression of fibrin/fibrinogen. Increases in expression of PAR1, 2, 3, and 4 following LPS administration, occurred at the message level. PAR1 and PAR2 increased in a time dependent manner, whereas, PARs3 and 4 had a biphasic change. PAR-1-4 immunoreactivities were differentially localized in hepatocytes, Kupffer cells, portal triad area and central veins.

CONCLUSION. The results suggest a close relation among proinflammatory cytokine, activated-coagulation induced fibrin deposition, and PARs. The increased expression of TNF, procoagulant molecules, and PARs may, in part, explain mechanisms that may underlie the pathogenesis for the development of liver injury during endotoxemia.

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0257

MICROVASCULAR ENDOTHELIUM MODULATES SMOOTH MUSCLE CELL CALCIUM SENSITIVITY IN SEPSIS

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INTRODUCTION. Sepsis is associated with microvascular hyporeactivity to vasoconstrictors. Whether the impairment in vasoreactivity is caused by defects in signal transduction pathway inherent to endothelial cells or smooth muscle cells remains unclear. The aim of this study was to determine if impaired vasoreactivity during LPS-induced inflammation is associated with altered Ca^{2+}-sensitivity in small mesenteric resistance arteries (SMRA).

METHODS. SMRAs were isolated from LPS-treated (15 mg/kg ip) and non-treated control (saline) mice (18 h). The arterioles (190-220 μm) were mounted on a pressure myograph, superfused, and loaded with fura-2. Arteriolar diameter and global intracellular Ca^{2+} were measured concurrently using light microscopy and a photomultiplier system. Dose-response curves to phenylephrine (PE, 10^{-9}-10^{-4}M) were conducted. Smooth muscle Ca^{2+}-sensitivity of SMRAs was assessed by stepwise increases in extracellular Ca^{2+} (0 to 2 mM) under depolarizing conditions (120 mM K^+).

RESULTS. LPS treatment resulted in hyporesponsiveness to PE as demonstrated by an increase in EC_{50} (0.7±0.2 μM vs 1.9±1.0 μM*) and a decrease in maximal contractile response (E_{max} 35±6% vs 19±9%*). Removal of the endothelium resulted in near normal responses to PE (EC_{50} 0.9±0.2 μM vs 1.0±0.6 μM and E_{max} 43±2% vs 38±5%*). Similarly, Ca^{2+} mediated vasoconstriction in intact vessels resulted in an increase in EC_{50} (0.23 ± 0.01 μM vs 0.39 ± 0.03 μM*) and a reduced E_{max} (42.8± 1.1% vs 26.6 ± 3.4%*). Removal of the endothelium also resulted in near normal response to Ca^{2+} (EC_{50} 0.34 ± 0.03 μM vs 0.33 ± 0.03 μM) with E_{max} reduced to a lesser extent (41.8± 1.5% vs 36.4 ± 1.2%*). In endothelium-denuded vessels LPS treatment increases vascular smooth muscle Ca^{2+} sensitivity as compared to controls. In intact vessels, the presence of endothelium shifts the Ca^{2+}-sensitivity so that it is relatively unchanged in LPS-treated intact vessels. In addition, the vessel wall $[Ca^{2+}]_i$ was reduced in LPS-treated vessel. (* $p < 0.05$)

CONCLUSION. LPS-induced inflammation results in endothelium-dependent hyporesponsiveness to vasoconstrictors and increased Ca^{2+}-sensitivity within smooth muscle cells (endothelium denuded). In intact vessels, LPS acts on the endothelium to moderate this increase in Ca^{2+}-sensitivity. Our findings are consistent with reduced Ca^{2+}-sensitivity in mouse microcirculation during LPS-induced inflammation.

0258

IN VITRO EFS-INDUCED JEJUNAL CONTRACTILITY IS NOT AFFECTED BY ENDOTOXIN EXPOSURE OR PERITONITIS

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INTRODUCTION. Secondary complications of sepsis often involve gastrointestinal dysfunction. Electric field stimulation (EFS) produces inhibition of spontaneous contractile activity in the ileum and a complex response in the jejunum which is mediated by regional compounds. We hypothesized that regional infection (peritonitis) and systemic inflammation (endotoxin infusion) diminish EFS-induced jejunal contractility differently, and that the inhibition of contraction can be (partially) reversed by inhibition of nitric oxide synthase.

METHODS. 15 anesthetized pigs were randomized to fecal peritonitis (P, n=4), continuous lipopolysaccharide infusion (E, n=7), and controls (C, n=4). After 24 hours of exposure to the different conditions, jejunal tissue was harvested and small pieces (P, n=8; E, n=15; C, n=8) mounted in organ chambers. Jejunal contractile activity was tested with and without nitric oxide (NOS) inhibition using EFS (10 seconds, 50 Hz) from 5 to 20 Volts (4 steps). The area under the curve of jejunal contraction was calculated. Groups were compared at each level of stimulation with the Kruskal Wallis Test. The effect of increasing voltage was assessed in each group separately using the Friedman Test.

RESULTS. (median, inter-quartile range); +p<0.01, increasing voltage without NOS inhibition; ++p<0.01, increasing voltage with NOS inhibition; *p<0.05, between groups.

TABLE 1.
Effect of EFS at different levels of stimulation

	5 Volts	20 Volts	5 Volts NOS Inhibition	20 Volts NOS Inhibition*
Controls+, ++	30 (12-49)	117 (105-179)	17 (13-31)	127 (108-181)
Peritonitis+, ++	31 (28-42)	71 (54-99)	26 (24-28)	70 (53-103)
Endotoxemia+, ++	29 (21-40)	80 (49-199)	26 (22-41)	77 (52-102)

CONCLUSION. Neither exposure to peritonitis nor to endotoxin decreased jejunal contractility, and NOS inhibition had no effect. We cannot exclude that pathways other than EFS leading to jejunal contractions are inhibited in sepsis. It should be evaluated whether the treatment (fluid management, vasoactive drugs, etc.) in sepsis is more relevant for gastrointestinal dysfunction than the disease itself.

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0259

EFFECT OF VENTILATORY RATE ON THE DEVELOPMENT OF VENTILATOR INDUCED LUNG INJURY IN A MOUSE MODEL

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INTRODUCTION. Both animal and human studies have shown that mechanical ventilation at high tidal volume can induce lung injury. The effect of different respiratory rates in the development of ventilator induced lung injury has not been clearly elucidated. Evidence from in vitro and in vivo studies suggest that low respiratory rate may ameliorate lung injury associated with high tidal volume ventilation. Aim of the present study was to examine the effect of mechanical ventilation at different, clinically relevant, respiratory rates and normal tidal volume on the inflammatory response of the lungs.

METHODS. Anesthetized C57BL/6 mice were placed on volume control ventilation for two hours at normal tidal volume (8-12 ml/kg) and randomized to normal (120br/min), low (-33%) and high (+33%) respiratory rate. Non-ventilated animals served as control. In ventilated animals external PEEP was kept at 1.5 cmH2O throughout the experiment. By appropriate adjustments of VT and inspiratory flow, minute ventilation and arterial blood gases were maintained similar among groups.

RESULTS. Compared to the normal rate group, BAL total protein and IL6 were significantly lower in low and high respiratory rate groups. Serum IL6 was significantly higher in all ventilated animals as compared to control group. BAL and serum MIP2 were not increased in any group. Compared to normal respiratory rate group, the expression of the proapoptotic protein BAX in the lung was upregulated in animals ventilated at both high and low respiratory rates. MAPK/ERK1/2 was upregulated in the lungs of all ventilated animals. Histological examination of the lungs reveled only minimal inflammatory infiltration in all ventilated animals with no difference among groups.

CONCLUSION. Ventilation at a lower respiratory rate may ameliorate lung inflammatory response to mechanical ventilation. Ventilation at high respiratory rate was also found to decrease inflammation, which could be attributed to lower tidal volume and inspiratory flow. A protective role of intrinsic PEEP caused by the high respiratory rate could not be also excluded.

REFERENCE(S). Am J Physiol Lung Cell Mol Physiol 285: L710–L718, 2003
Am J Respir Crit Care Med Vol 165. pp 242–249, 2002
JAMA 282:54–61, 1999
Intensive Care Med 30:536–555, 2004
J Clin Invest 99:944–952, 1996
J Appl Physiol 85:1753–1761, 1998
Am J Respir Crit Care Med 166, 1282–1289, 2002
Journal of Surgical Research 113, 139–145, 2003
Crit Care Med 33:835–840, 2005
Am J Respir Crit Care Med 172. 334–343, 2005
Current Opinion in Critical Care 11:82–86, 2005.

0260

POTENTIAL CONTRIBUTION OF THE CGMP TRANSPORTING MRP5 (ABCC5) TO HEART FAILURE IN SEPSIS

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INTRODUCTION. We recently demonstrated the expression of the multidrug-resistance protein 5 (MRP5), a cellular export pump for cyclic GMP, in human heart. Because MRP5 contributes to the reduction of intracellular cGMP by energy-dependent outward transport, the regulation of cardiac MRP5 may impair cardiac function. We therefore investigated the influence of the LPS-shock model on cardiac MRP5 expression in a rodent model.

METHODS. Female C57BL/6N mice were injected 8 µg/g LPS in PBS intraperitoneally. Native as well as PBS-injected mice served as controls. Hearts were excised after 10 hours. MRP5 mRNA was quantified using a TaqMan-based real time RT-PCR assay. Serum levels of IL-6 were assessed and correlated to the individual MRP5 mRNA levels. Furthermore, mice heart muscle HL-1 cells were exposed to IL-6 to determine the direct mediator effects on heart muscle cells. Untreated HL-1 cells served as controls. MRP5 protein was assessed using western blot and confocal laser scanning microscopy techniques and the anti-MRP5 AMF antibody.

RESULTS. MRP5 was found in all hearts tested and localized predominantly to cardiomyocytes. Cardiac MRP5/GAPDH mRNA copy numbers were 56.3±16.1*10-4 (n=9) for native controls and 54.1±14.8*10-4 for PBS controls (n=6), compared to 31.9±16.8*10-4 in the LPS experiments (n=9, P=0.025). The IL-6 levels in the LPS-treated mice were significantly increased compared to both the PBS-treated and the native controls. MRP5/GAPDH mRNA levels in HL1-cells exposed to LPS were significantly reduced.

CONCLUSION. MRP5 is downregulated in heart muscle cells by experimental LPS endotoxaemia in vivo and in vitro. The stimulus for MRP5 downregulation might be within the serum of septic animals and may correspond to IL-6. Reduced cGMP transportpotentially contributes to impaired cardiac function in septic cardiomyopathy.

REFERENCE(S). (1) Jedlitschky et al. J Biol Chem 2000;275:30069-30074;
(2) Dazert et al. Am J Pathol 2003, 163:1567-1577.

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0261

TISSUE OXYGEN AND HAEMODYNAMIC MONITORING IN AN ACUTE MODEL OF SEPSIS

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INTRODUCTION. Tissue oxygen tension represents the balance between local supply and demand and may be a useful marker of the adequacy of tissue perfusion in critical illness. We previously reported that bladder epithelial PO_2increases in an acute model of endotoxic sepsis, suggesting availability but decreased cellular utilisation of O_2 (Rosser et al., 1995). In the present study we sought to compare bladder tissue PO_2measurements against those measured in more vital organs following acute lipopolysaccharide (LPS) challenge in rats.

METHODS. Under isoflurane anaesthesia, male Wistar rats (approx 300g) underwent arterial (left common carotid) and venous (right jugular) cannulation for blood sampling and BP monitoring, and fluid and drug administration, respectively. Flow in the descending aorta (ABF) and left renal artery (RBF) were monitored by ultrasonic flow probes (Transonic Systems, USA). Tissue PO2 was determined using Oxylite probes (Oxford Optronix, UK) placed in thigh muscle, between the right and left lobes of the liver, in the left renal cortex and within the bladder lumen. After a 30-min stabilisation period, rats (6 per group) were subjected to iv LPS (10 mg/kg) or vehicle (n-saline) and resuscitated with n-saline (20 ml/kg/h). Statistics were performed using two-way RM-ANOVA and post-hoc Tukey's test.

RESULTS. Data shown as mean (± SE), *p<0.05 between vehicle & LPS; †p<0.05 between timepoint & baseline.

TABLE 1.

	BP (mmHg)	ABF (ml/min)	RBF (ml/min)	Muscle PO_2 (kPa)	Bladder PO_2 (kPa)	Liver PO_2 (kPa)	Kidney PO_2 (kPa)
Sham (0 h)	94 (2)	49 (6)	7.3 (1.1)	5.6 (0.5)	8.2 (0.4)	3.0 (0.3)	2.1 (0.4)
Sham (1 h)	104 (7)	38 (3)†	7.8 (1.3)	6.7 (0.7)	8.8 (0.4)	3.7 (0.5)	3.2 (0.5)†
Sham (2 h)	103 (6)	39 (4)†	7.2 (1.0)	6.8 (0.6)†	6.8 (0.5)	3.4 (0.4)	3.9 (0.6)†
Sham (3 h)	96 (7)	38 (5)†	7.6 (1.1)	6.7 (0.5)	5.5 (0.4)†	3.9 (0.4)†	4.1 (0.6)†
LPS (0 h)	94 (6)	44 (3)	7.0 (1.2)	5.9 (0.9)	8.5 (0.7)	3.0 (0.5)	2.1 (0.4)
LPS (1 h)	111 (3)	37 (5)	6.2 (1.4)	7.0 (0.9)	10.1 (0.6)	2.6 (0.5)	3.3 (0.5)†
LPS (2 h)	114 (5)	27 (3)†*	6.9 (1.5)	6.1 (0.7)	10.4 (0.3)†	1.7 (0.3) †	3.1 (0.7)†
LPS (3 h)	103 (8)	24 (3)†*	5.8 (1.5)	4.7 (0.7)†	9.4 (0.6)†*	0.7 (0.2) †	3.0 (0.7)†

CONCLUSION. In this short-term, fluid resuscitated, severe model of endotoxic sepsis, different patterns were observed in tissue PO_2in the four organs studied, with rises in bladder and falls in muscle and (particularly) liver. Changes were not related (where measured) to blood flow. These data suggest that early responses to sepsis are organ-specific and may relate to local changes in oxygen supply, demand and utilisation.

REFERENCE(S). Rosser et al. JAP 1995;79:1878

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0262

BLOOD FLOW REGULATION AND METABOLIC CONSEQUENCES DIFFER IN PERITONITIS VS. ENDOTOXIN INFUSION

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INTRODUCTION. The hepatosplanchnic region is both an important source and target of inflammatory mediators in sepsis. We hypothesized that peritonitis interferes to a greater extent with hepatosplanchnic perfusion and metabolic demands than systemic inflammation induced by endotoxin.

METHODS. 14 anaesthetized pigs were randomized to controls (C), endotoxin-infusion (0.8-1.4 µg/kg/h LPS; E) or faecal peritonitis (P). Systemic (thermodilution) and regional abdominal blood flows (Doppler ultrasound) were measured hourly and lactate 6- hourly.

RESULTS. CO: cardiac output; SMA/V: superior mesenteric art./vein; SA: spleen a/v; HA/V: hepatic a/v; PV: portal vein.
All values are median (range).

TABLE 1.
Regional Blood Flows and Lactate Concentrations:

	C Baseline	C 12h	E Baseline	E 12h	P Baseline	P 12h
CO ml/kg/min	95 (84-111)	88 (66-129)	64 (61-74)	110 (75-118)*	74 (59-92)	83 (50-133)*
HA ml/kg/min	4 (1-5)	4 (1-8)	4 (2-4)	5 (4-11)	3 (2-7)	5 (1-8)
SMA ml/kg/min	16 (10-21)	19 (12-24)	15 (9-17)	16 (14-22)	16 (12-22)	15 (12-19)
PV ml/kg/min	17 (13-26)	20 (15-29)	19 (16-20)	25 (16-35)	21 (15-24)	17 (8-21)
SA ml/kg/min	1.4 (1.0-1.5)	1.2 (1.0-2.7)	1.6 (0.9-2.8)	1.7 (1.7-6.6)	1.2 (0.7-1.6)	0.9(0.4-2.3)*
HV mmol/L	0.3 (0.2-0.5)	0.3 (0.3-0.4)	0.3 (0.3-0.5)	0.3 (0.3-0.5)	0.5 (0.4-0.5)	1.1 (0.3-1.6)
SMV mmol/L	0.6 (0.4-0.8)	0.7 (0.6-0.8)	0.7 (0.7-0.8)	1.0 (0.9-1.0)	1.0 (0.8-1.4)	1.9(1.1-2.7)§
PV mmol/L	0.7 (0.5-0.8)	0.7 (0.6-0.8)	0.7 (0.7-0.8)	0.9 (0.8-0.9)	0.8 (0.7-1.0)	1.9 (1.2-2.1)
SV mmol/L	0.7 (0.6-0.9)	0.7 (0.6-0.8)	0.8 (0.7-1.5)	0.9 (0.8-0.9)	0.7 (0.7-0.9)	1.7(1.2-2.2)§

**Friedman p<0.03; §Wilcoxon, vs. C, p: 0.008*

CONCLUSION. Both in peritonitis and during endotoxemia, fractional abdominal blood flows decreased. Unexpectedly, peritonitis was associated with an absolute decrease in spleen blood flow. High lactate concentrations in the spleen and mesenteric vein demonstrate that the gut and the spleen are at increased risk in peritonitis. Whether increased metabolic demands in these organs contribute to the high lactate concentrations has to be determined.

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0263

MYELOPEROXIDASE ACTIVITY RATHER THAN QUANTITY DETERMINE OUTCOME IN SEPSIS

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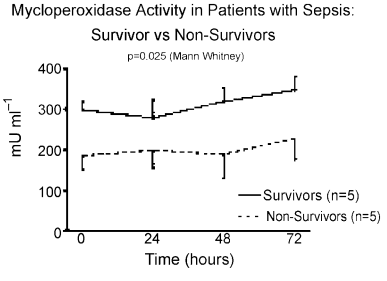
INTRODUCTION. Sepsis and multi organ dysfunction represents the leading cause of death in critically ill patients, with an associated mortality of 30-45%. Neutrophil recruitment and activation represent key defence mechanisms in combating microbial invasion, acting via myeloperoxidase (MPO) to produce hypochlorous acid (HOCl), an aggressive oxidant and anti-microbial agent. Caeruloplasmin (CP), an acute phase copper protein has been shown to bind MPO and decrease production of HOCl.

METHODS. Adult critically ill patients with sepsis were recruited within 24 hours of a diagnosis. Heparinised blood was taken at 4 time points, 24 hour apart. Samples were analysed for: MPO activity, spectrophotometric assay, oxidation of tetra-methyl benzidine to a chromophore at 652nm; MPO by ELISA; CP by radial immunodiffusion.

RESULTS. Comparison was made between survivors and non-survivors. Survivors had significantly greater MPO activity (p=0.03) and MPO activity / unit protein (p=0.02) in the study period. CP levels increased daily compared to non-survivors who had no rise (443 vs 284 mg/l, 72hr). There was no difference in neutrophil count.



CONCLUSION. Survivors of sepsis generate greater MPO activity and activity / unit protein than non-survivors, despite having raised CP, an inhibitor of MPO activity. Interestingly plasma from volunteers similarly shows high activity relative to a small quantity of MPO. We propose that non-survivors of sepsis have dysfunctional MPO which is unable to generate sufficient activity for the purposes of microbial killing.

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0264

ALTERATIONS OF ENERGETIC METABOLISM OF CIRCULATING IMMUNE CELLS INDUCED BY SEPTIC PLASMA

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INTRODUCTION. A mitochondrial dysfunction has been described for human peripheral blood mononuclear cells (PBMC) during septic shock. Little is known about consequences of these metabolic alterations on PBMC functions. Purposes of this present study are: 1) to assess global oxygen consumption rate (VO2) of PBMC and fractions for NADPHoxidase and 4 metabolic routes which consume also ATP, 2) to study modifications of these patterns by septic plasma incubation.

METHODS. PBMC have been isolated by gradient centrifugation from the whole blood of 8 healthy volunteers. Cells were incubated for 3 hours either in their own plasma (control) or in pooled plasma obtained from 6 septic shock patients. VO2 has been measure amperometrically for quiescent and stimulated cells (PMA and ionomycin). To quantify the fractions of VO2 for the main ATP consuming pathways, inhibitors of protein synthesis (cycloheximide), RNA/DNA synthesis (actinomycin D), Na+, K+ ATPase (ouabain) and Ca2+ ATPase (lanthanum chloride) were applied. Oxygen consumption rates of NADPH oxidase and of respiratory chain were also quantified by inhibition with DPI (for NADPHoxidase) and antimycin A (for complex III). Satistics: Wilcoxon rank tests, results: mean ± SD.

RESULTS. VO2 of quiescent PBMC decreased when PBMC are incubated in septic plasma (5.7±1.43 and 7.22±1.74 ng.atom O2/min/107 cells (U) for septic and control plasma respectively, p=0.011). A trend to a mitochondrial respiration rate decreased was observed. Only VO2 linked to Na+, K+ ATPase activity was significantly reduced in septic plasma (p=0.021). The fraction of total VO2 related to NADPHoxidase in quiescent cells was similar in the two conditions. Stimulation increased NAPH oxidase VO2 in both experimental conditions but increased more in septic plasma (+3.86±3.08 and +0.6±1.34 U for septic and control condition, respectively, p=0.036).

CONCLUSION. Septic shock plasma modifies bioenergetics of healthy PBMC, especially by reducing cells global oxygen consumption. Stimulation with PMA and ionomycine increased NADPHoxidase oxygen consumption rate, but more in incubation in septic plasma. Septic plasma increases reactive oxygen species production, and also oxidative stress under PBMC stimulation.

REFERENCE(S). Adrie et al, Am J Respir Crit Care Med. 2001;164(3):389-95.

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0265

ENHANCED MITOCHONDRIAL RESPIRATION DURING EARLY STAGES OF FECAL PERITONITIS

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INTRODUCTION. The presence of muscle mitochondrial dysfunction during experimental sepsis is controversial [1,2]. It is conceivable that the experimental sepsis model has an impact on mitochondrial performance.

METHODS. 33 anesthetized pigs were randomized to either saline (C, n=12), continuous endotoxin infusion (E, n=9) or fecal peritonitis (P, n=12) for 24 hours. Cardiac index (thermodilution, ml/kg/min) and systemic mean arterial pressure (MAP, mmHg) were recorded and glutamate-dependent State 3/4 (isolated muscle mitochondria, nanoatom O_2/min/mg protein), respiratory control ratio (RCR) and tissue ATP (mumol/g) measured at baseline, after 6 hours and at the end of the experiment.

RESULTS. [a]p< 0.05 vs. baseline; [b]p< 0.05 vs. control.

TABLE 1.

	CI	MAP	STATE3	STATE 4	RCR	ATP
C Baseline	95 (50-181)	70 (57-78)	204(101-303)	17 (9-34)	9.8(6.3-19.5)	5.5 (3.4-6.4)
E Baseline	72(64-107)	75 (60-87)	140(68-260)	12 (5-34)	12.6(6.4-17)	4.6 (2.4-5.9)
P Baseline	87(59-120)	64 (56-116)	179(53-258)	12 (7-20)	13(7.1-20.4)	5.8 (2.9-8.3)
C 6 hours	100(56-169)	75 (57-87)	250(64-398)	18(11-42)	10.2 (4.8-23)	5.7 (3.7-7.5)
E 6 hours	94(61-144)	92 (58-132)[b]	216(64-267)	16 (10-48)	12.5 (5.1-17)	6.6 (4.2-7.4)
P 6 hours	105(52-135)	77 (61-126)	220 (96-316)[a]	18 (11-25)[a]	13.3(4.9-19)	5.9 (4.4-9.9)
C End	119(70-127)[a]	74 (44-101)	198(38-327)	15 (9-39)	12.3 (4.2-20)	5.3 (3.6-6.7)
E End	138(72-239)	79 (48-109)	169 (46-249)	20 (3-43)	9.8(4.0 -16)	6.1 (0.7-7.5)
P End	111(96-301)[a]	54 (36-98)	172 (73-371)	20 (13-49)[a]	9.3(2.2-18.3)	5.2 (0.5-7.0)

CONCLUSION. Despite signs of systemic inflammation and pulmonary artery hypertension, both peritonitis and endotoxemia were associated with remarkably stable hemodynamics. This was associated with maintained efficiency of muscle mitochondrial function. The increase in State 3 and 4 mitochondrial respiration after 6 hours of fecal peritonitis may indicate enhanced cellular metabolism in the early stage of infection.

REFERENCE(S). 1) Brealey D. et al. Am J Physiol Regul Integr Comp Physiol 286:R491-497, 2004. 2) Porta F. et al. Crit Care Med 31(12). A 47,2004.

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0266

INFLAMMATORY SIGNALING AND PHYSIOLOGICAL PARAMETERS: A EVALUATION OF THE MURINE CLP MODEL

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INTRODUCTION. Cecal ligation and puncture (CLP) is a clinically relevant sepsis model and suitable for studying the systemic response to infectious peritonitis. While there are numerous studies using single-size needles for CLP that have investigated different aspects of sepsis, comprehensive studies on the activation kinetics of stress related signaling pathways and the accompanying pathophysiology subsequent to different needle sizes are scarce. The purpose of this study was to investigate inflammatory and physiological alterations in CLP sepsis models of increasing lethality and to characterize the micriobiological data at several pathophysiological stages of sepsis.

METHODS. Sepsis was induced in female C57BL/6J-mice by CLP with increasing needle sizes (G26, G22 and 18G). Control mice underwent sham-operation (Sham). At different time points up to 9 days lung and spleen were harvested and cellular protein extracts were prepared. Activation of transcription factors and expression of cellular signaling proteins were determined by EMSA and IB. Apoptosis was determined by means of TUNEL-Assay. Additionally, we implanted a minitransmitter (DSI) subcutaneously 2 weeks before CLP/Sham operation. Temperature, heart rate and activity were obtained for 10 days. Mortality rates and a murine Sepsis Severity Score (SSS) were determined also up to 10 days.

RESULTS. Mortality rates show a clear relationship with the needle size of cecal puncture. Mortality could not be predicted using the SSS. NF-kB DNA binding activity in lung and spleen of Sham-mice showed a biphasic activation pattern. In contrast, NF-kB activity in both organs of 18G-treated animals was clearly diminished after 6h and showed no further increase. The 22G-treated group showed a biphasic activation pattern with a boosted second activation peak. Histological findings and apoptosis rates showed organ destruction pattern which positively correlate to the needle size. Heart rate of wt and Sham mice showed a characteristic diurnal rhythm whereas intervention led to decreased heart rates and loss of diurnal rhythm. Recovery of activity and body temperature negatively correlates with the severity of insult.

CONCLUSION. Our data clearly demonstrate that sepsis of increasing severity induced suppression of physiological parameters including loss of diurnal rhythm and increasing signs of organ destruction, which in turn correlated with morbidity and mortality. Interestingly, NF-kB activity in severe septic mice was dramatically reduced, suggesting that adequate activation of NF-kB is essential to recover from severe sepsis.

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0267

THE DUFFY ANTIGEN RECEPTOR FOR CHEMOKINES (DARC) - LINKING INFLAMMATION AND HEMOSTASIS

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INTRODUCTION. Chemokines and their respective receptors play a pivotal role in neutrophil recruitment during inflammation and in platelet activation. DARC differs from 'typical' chemokine receptors in that it is not known to initiate intracellular signal transduction and that it is expressed on red blood cells and endothelial cells rather than on leukocytes. However, the role of DARC in vivo remains unclear.

METHODS. We compared wild-type (WT) and DARC gene-deficient mice (DARC-/-) using a neutrophil-dependent model of aspiration pneumonitis (AP) and standard hemostasis assays. AP was induced by intratracheal instillation of HCl. After 2h of mechanical ventilation, blood samples for arterial blood gas analysis were drawn and both lungs were harvested. Lung myeloperoxidase activity (MPO) was measured as an indicator of total pulmonary PMN content. Blood samples from untreated WT and DARC-/- were taken for standard hemostasis assays, including platelet count and bleeding time. ANOVA plus subsequent SNK-test, t-test, and Kruskal-Wallis-test were used for statistical analysis where appropriate (data are given as mean+/-SEM, n=6-20).

RESULTS. Wild-type mice (WT) experienced severe hypoxemia 2h after intratracheal HCl-instillation (sham paO2 134±13mmHg, ALI paO2 47±5 mmHg, $p<0.05$) and a more than two-fold increase in lung myeloperoxidase activities (MPO, $p<0.05$), indicating strong pulmonary PMN recruitment. By contrast, DARC-/- demonstrated no significant changes in paO2 and in lung MPO. When compared to WT, DARC-/- also exhibited a significanltly prolonged bleeding time (WT median 57sec, DARC-/- median 107sec, $p<0.05$) despite normal and statistically not different platelet counts (WT 702.954±26.073/µl, DARC-/- 638.068±28.771/µl).

CONCLUSION. In conclusion, we demonstrate that DARC can act as a powerful modulator of inflammatory PMN recruitment and subsequent lung injury as well as as a key factor in platelet-dependent pathways of hemostasis. Thus, DARC might represent a new, previously yet unknown connection between inflammation and hemostasis.

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0268

CHANGES OF CEREBRAL PROTEOM EXPRESSION IN SEPTIC RATS

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INTRODUCTION. Sepsis and septic shock are often complicated by septic encephalopathy. The cause of brain dysfunction in sepsis is not fully understood so far. Proteom analysis is a tool to detect previously unknown protein alterations. The aim of the present study was to explore whether sepsis lead to alterations on the cerebral proteom profile 12, 24, and 48 hours after the onset of sepsis in a common rat model.

METHODS. After approval of the local committee for animal research, 72 male wistar rats were investigated. To induce sepsis, 46 rats unterwent coecal ligation and puncture (CLP) and were investigated 12h (n=6), 24h (n=9) or 48h (n=4) after CLP. N=16 rats (12h: n=6; 24h: n=4; 48h: n=6) were assigned to the control group (sham operation). Two-dimensional gel electrophoresis and mass spectrometry were used to identify changes in the protein expression of the whole brain lysat.

RESULTS. N=27 (59%) rats of the sepsis group died before analysis; no rat of the control group died. Per gel more than 1.600 protein spots could be discriminated. Protein expression changes of at least twofold were stated as statistic significant. After 12 hours six differentially expressed proteins (upregulated/UR vs. downregulated/DR) were associated with functions in cell structure (1DR), metabolism (1UR), respiratory chain (1DR), and signaling (1DR, 1UR). One unclassified protein was UR. After 24 hours 32 expressed proteins were associated with functions in protein folding (1DR), cell structure (4DR), gene expression and protein synthesis (4DR), metabolism (6DR), respiratory chain (4DR), signaling (2DR), and secretion (4DR). Seven unclassified proteins were DR. After 48 hours six expressed proteins were associated with functions in metabolism (3DR), and secretion (1DR). Two unclassified proteins were UR. Alltogether, the role of 10 (unknown) proteins remains unclear.

CONCLUSION. We provide the first study of brain lysat proteom in septic rats. In early sepsis (12 hours) cell integrity seems to be reduced, whereas metabolism is activated. After 24 and 48 hours mainly all identified proteins were downregulated (e.g. metabolism and secretion). Proteom analysis is a useful tool to detect previously unknown alterations in brain lysat after induction of severe sepsis (mortality 59%). Further analysis of the function of the differentially expressed proteins in septic encephalopathy are needed.

0269

SERUM PROTEOM ALTERATIONS IN SEPTIC RATS

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INTRODUCTION. Sepsis and septic shock have still a high mortality rate. Protein markers for sepsis may be present in the serum and may thus be identified with proteom analyis. The aim of the present study was to explore whether sepsis induced by a common septic rat model may lead to serum proteom disturbances after 12, 24, and 48 hours.

METHODS. After approval of the local committee for animal research, 72 male wistar rats were investigated and assigned to a control group (sham operation) and three sepsis groups (12h: n=6 vs. 24h: n=9 vs. 48h: n=4). To induce sepsis 46 rats unterwent coecal ligation and puncture (CLP), 16 rats were assigned to the control group sham-operated. Blood samples were collected at the killing-time of each group and albumin-depleted serum was used for proteomics. Two-dimensional gel electrophoresis and mass spectrometry were used to identify changes in the protein expression between septic and non-septic serum samples.

RESULTS. N=27 rats of the sepsis group died (mortality 59%); no rat of the control group died. We found changes of at least twofold in 335 proteins of the more than 1.000 protein spots discriminated in each gel. After 12 hours eleven differentially expressed proteins (upregulated/UR vs. downregulated/DR) were associated with functions in cell structure (1DR), transport (6DR), metabolism (1DR), secretion (1DR), proteolysis (1DR), and complement system (1UR). After 24 hours five differentially expressed proteins were associated with functions in transport (2DR), metabolism (1DR), proteolysis (1DR), and other functions (1DR). After 48 hours 16 differnetiallly expressed proteins were associated with functions in cell structure (1DR, 1UR), transport (7DR, 2 UR), secretion (2DR), proteolysis (1DR), and other functions (1DR, 1 UR).

CONCLUSION. Severe sepsis in this animal model induced significant alterations in the serum proteom after 12, 24, and 48 hours after onset of the sepsis in rats. Mainly transport and secretion proteins were upregulated, whereas the expression the other proteins were downregulated.

Poster Sessions
Basic research in sepsis (II): Therapeutic trials 0270-0283

0270

EARLY PREDICTORS OF OUTCOME IN A LONG-TERM FLUID-RESUSCITATED RODENT MODEL OF SEPSIS

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INTRODUCTION. Rodent models of sepsis rarely receive intravenous fluid resuscitation, a standard of care in septic patients. We used echocardiography to identify prognostic parameters during the early phase of sepsis in a long-term fluid-resuscitated rodent model of faecal peritonitis.

METHODS. Instrumented, awake and mobile male Wistar rats (315g) had sepsis induced via i.p. injection of faecal slurry. Sham-operated controls received no slurry. At 2h a 50:50 colloid-glucose iv infusion was begun, with an initial rate of 10ml/kg/h between 2-24h, and halving thereafter at 24h intervals. An additional colloid bolus of 25ml/kg (7.5ml) was given at 6h as pilot studies showed this maximised cardiac output and improved outcomes. Under a short period of isoflurane anaesthesia echocardiography was performed both before injection of slurry (baseline) and at 6h (pre-fluid bolus).

RESULTS. Five septic animals died between 6-24h and one at 40h. Three septic and all sham animals survived until study end (72h). At baseline, blood pressure (BP), cardiac output (CO), left ventricular end-diastolic volume (LV-EDV) and fractional shortening (FS) did not differ between groups.

TABLE 1.

Haemodynamic data at 6h (pre-fluid bolus) - shown as mean (SEM).

	Sham (n=4)	Sepsis (n=9) all	Sepsis (n=4) survival >24h	Sepsis (n=5) survival <24h
BP (mmHg)	103 (3)	124 (2)*	122 (3)	125 (2)
CO (ml/min)	94 (6)	67 (7)*	85 (8)	53 (2)**
LV-EDV (ml)	0.40 (0.02)	0.23 (0.03)*	0.30 (0.03)	0.17 (0.04)**
FS (%)	45 (2)	56 (4)*	46 (4)	63 (2)**

** p<0.05 between sham and sepsis, ** p<0.05 between survival >24h and <24h*

CONCLUSION. Despite identical volumes of faecal slurry and high volume resuscitation (totalling 40ml/kg) in the first 6h, over half the septic rats showed marked underfilling of the left ventricle despite a maintained/elevated BP. A higher LVEDV and normal values of FS at this 6h timepoint were associated with survival >24h. Our data highlight major individual variation in the response to sepsis and the importance of fluid resuscitation.

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0271

NF-κB ENHANCEMENT REDUCES LYMPHOCYTE DEATH AND IMPROVES SURVIVAL IN MURINE SEPSIS

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INTRODUCTION. Sepsis-induced apoptosis of lymphocytes is associated with immune dysfunction and fatal outcome. Interestingly, prevention of lymphocyte apoptosis improves survival of septic mice. However, the molecular mechanisms leading to lymphocyte death during sepsis are not clear. Regular activation of NF-κB is essential to prevent T cells from TNFα-induced apoptosis. As sepsis is characterized by increased levels of TNFα, the NF-κB pathway might play an important role in this scenario. Here we address the question whether thymocyte apoptosis in murine sepsis is associated with reduced NF-κB activity. Moreover, via enhancement of NF-κB activation in lymphocytes we tried to prevent lymphocyte death and to improve survival rates of septic mice.

METHODS. Severe sepsis was induced in female C57BL/6- mice by cecal ligation and puncture [20G] (CLP). Thymus and spleen were harvested up to 24h from CLP and sham-operated mice. NF-κB activity was determined by Electrophoretic Mobility Shift Assay (EMSA) using cellular protein extracts. Tissue sections were H&E and trichrome (Masson-Goldner) stained. Apoptosis was analyzed via TUNEL-Assay. Mortality was determined up to 48h. IκBα-deficiency is known to cause increased NF-κB activation. To analyze the effects of enhanced NF-κB activation, we adoptively transferred Iκbα-/- or wild-type (wt) fetal liver stem cells into sublethally irradiated lymphopenic Rag1-/- -mice (RC) and CLP was performed.

RESULTS. NF-κB DNA binding activity in thymus and spleen of Sham-mice showed a distinct increase within 6h and a second peak after 24h. In contrast, NF-κB activity in both organs of CLP-operated animals was clearly diminished after 6h and showed no further increase. Apoptosis was dramatically increased after 12 and 24h in thymus as well as in spleen in CLP-mice compared to Sham-mice. H&E and trichrome staining showed increased organ destruction. Interestingly, CLP-operated Ikbα-/- RCs showed clearly reduced apoptotic rates and less organ destruction compared to sham mice. Moreover, CLP-treated B6-mice and RAG-wt-RCs were severely sick during the whole observation period and died between 32 and 48h. Instead, Iκbα-/- RCs showed increased survival.

CONCLUSION. During severe sepsis increased apoptotic rates in spleen and thymus are associated with reduced NF-κB activity in thymocytes. Enhancement of NF-κB activity prevents lymphocyte death and improves survival. Our data suggest that NF-κB signaling in lymphocytes is essential for adaptive immune responses during sepsis.

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0272

SIRNA TARGETING CASPASE-3 AND -8 PREVENTS ENDOTHELIAL CELL DERANGEMENTS IN SEPTIC MICE

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INTRODUCTION. Dysfunction of vascular endothelium has been implicated in the development of the sepsis-related complications, including disseminated intravascular coagulation and multiple organ failure. We investigated the effects of short double-stranded RNA fragments termed small interfering RNAs (siRNAs) targeting caspase-3 and -8, a family of cysteine proteases that act as pro-apoptotic regulators, on endothelial cell injury in a septic mouse model.

METHODS. In BALB/c male mice (8-12 week-old), sepsis was induced by cecal ligation and puncture, and aorta was harvested 10 and 24 h after the onset of sepsis. Sham-operated animals underwent the same procedure except for ligation and puncture of the cecum. SiRNAs targeting caspase-3 and -8 were introduced to the mouse 10 h after the onset of sepsis via intravenous injection by means of the liposome method.

RESULTS. Western blot analysis showed that phosphatidylinositol 3'-kinase (PI3K) protein expression relative to that of sham-operated control was decreased by 60% in aortic membranes from mice 24 h after the onset of sepsis. Furthermore, a 60% reduction in the phosphorylated level of Akt was found in septic aorta without any significant change in total Akt expression. While the anti-apoptotic marker, phosphorylated Bad, was significantly down-regulated by sepsis induction, both caspase-3 and -8 were time-dependently up-regulated in septic mouse aorta (4∼5-fold at 24 h). Transfection with caspase-3 and -8 siRNAs resulted in complete restoration of the septic changes in membranous PI3K, Akt phosphorylation, Bad phosphorylation and caspase-3 and -8. Transmission electron microscopy of septic mouse aorta revealed detachment of endothelial cells, endothelial denudation, and microthrombus in the endothelial surface area, all of which were significantly improved by silencing of caspase-3 and -8 using siRNAs.

CONCLUSION. These results suggest that derangement of pro-apoptotic regulator expression plays a critical role in the development of endothelial histological injury after induction of sepsis. Since the PI3K/Akt pathway is considered to represent an effecter mechanism that promotes cell survival in the setting of sepsis, interruption of PI3K/Akt pathway activation could also contribute to sepsis-induced morphological injury in endothelial cells.

0273

SUCCINATE IMPROVES MITOCHONDRIAL OXYGEN CONSUMPTION IN SEPTIC RAT SKELETAL MUSCLE

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INTRODUCTION. Mitochondrial oxygen consumption (VO_2) depends on the flow of electrons through the electron transport chain (ETC) and is normally coupled to energy (ATP) production. Electrons enter the ETC through Complex I (CI) or II (CII). Inhibition of CI, but not CII, has been described during sepsis (1). The aim of this study was to investigate if succinate, a CII-specific electron donor, can improve mitochondrial VO_2 during sepsis.

METHODS. Skeletal muscle fibres were isolated from naïve (n=15), sham-operated (n=15), mildly (n=10), moderately and severely (n=10) septic rats, 48 hours after induction of faecal peritonitis and fluid resuscitation. Mitochondrial (cyanide-sensitive) VO_2 was studied in the presence of glutamate plus malate (CI-specific electron donors) and after the addition of succinate (CII-specific electron donor) using a Clark oxygen electrode (Rank Brothers, UK).

RESULTS. Mitochondrial VO_2 rates (nmol O_2/min/mg of tissue) in the presence of glutamate plus malate and after the addition of succinate are reported (as means±SE) in Table 1. Relative changes recorded after the addition of succinate (Delta VO_2) are also presented. During moderate and severe sepsis, skeletal muscle mitochondrial VO_2 in the presence of glutamate plus malate was significantly lower than in naïve and sham-operated animals; after the addition of succinate, it increased to the same level as that of the controls.

TABLE 1.

	Naïve (n=15)	Sham (n=15)	Mild sepsis (n=10)	Moderate and severe sepsis (n=10)
Glutamate+malate	1.08±0.05	1.01±0.06	0.90±0.04	0.76±0.05*
Glutamate+malate+succinate	1.20±0.07	1.08±0.05	1.04±0.02	1.05±0.04
Delta VO_2 (%)	11±4	10±5	17±6	39±6*

*Two-way repeated measure ANOVA and post-hoc Tukey tests; *p<0.01 vs naïve and sham*

CONCLUSION. Mitochondrial VO_2 in the presence of glutamate plus malate was decreased in moderately and severely septic rat skeletal muscle, suggesting inhibition of CI. Administration of succinate, an electron donor able to bypass CI, reversed this abnormality and may therefore represent a potential strategy to improve mitochondrial function during sepsis.

REFERENCE(S). 1. Brealey D et al, Am J Physiol Regul Integr Comp Physiol. 2004

0274

FECAL PERITONITIS AND CONTINUOUS ENDOTOXEMIA INDUCE DIFFERENT MECHANISMS TO MAINTAIN HEPATOCELLULAR AND MITOCHONDRIAL FUNCTIONS

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INTRODUCTION. Liver dysfunction is common in sepsis [2]. This may be related to regional blood flow limitation or redistribution [1]. We hypothesized that infection which is primarily located in the abdominal region (peritonitis) interferes to a greater extent with liver perfusion and function than systemic inflammation induced by endotoxin.

METHODS. 27 anesthetized pigs were randomized to either saline (C, n=11), continuous endotoxin infusion (E, n=7), or fecal peritonitis (P, n=9) for 24 hours. Systemic (thermodilution) and regional hepatic (ultrasound Doppler) and microcirculatory blood flow (laserDoppler, blood perfusion unit, BPU) were measured and oxygen transport and hepatic lactate exchange (mumol/min/kg) calculated. At the end of the experiment, glutamete-dependent liver mitochondrial respiratory ratio (RCR) was assayed polarographically.

RESULTS. [a] p<0.05 Friedman test, [b] p<0.01 Friedman test, [c] p<0.05 vs C.

TABLE 1.

	CI ml/kg/m	Hep. blood flow ml/kgmin	Hep. oxygen extraction %	Hep. lactate exchange	Liver BPU % of baseline	
C Baseline	89 (50-181)	24 (17-34)	41 (34-65)	8 (5-13)		
E Baseline	72 (64-97)	19 (15-26)	54 (44-62)	8 (2-10)		
P Baseline	84 (59-114)	21 (15-38)	47 (24-61)	9 (2-26)		
C 6 hours	103 (53-169)	31 (18-38)	39 (33-65)	9 (3-13)	108 (27-190)	
E 6 hours	94 (61-144)	27 (20-31)	48 (38-82)	10 (7-16)	75 (23-118)	
P 6 hours	98 (75-135)	23 (12-34)	40 (22-66)	13 (-1-30)	102 (53-234)	
C End	119 (70-127)[a]	33 (16-42)[b]	34 (25-45)	12 (2-16)	72 (10-909)	3.6 (2.6-4.8)
E End	124 (72-154)[a]	36 (22-47)[b]	37 (20-60)	12 (5-25)	67 (23-99)[a]	5.0 (3.6-6.0)
P End	111 (96-301)[a]	25 (16-56)	46 (43-66)[c]	11 (4-23)	131 (33-740)	3.4 (2.7-6.3)

CONCLUSION. Fractional hepatic blood flow decreased in peritonitis but not during continous endotoxin infusion while liver perfusion seemed to be heterogeneous especially during endotoxemia. High oxygen extraction may help to maintain lactate exchange and mitochondrial function in peritonitis.

REFERENCE(S). 1) Hiltebrand LB et al Crit Care Med 28(9):3359-60, 2000
2) Crouser ED et al Crit Care Med 30:276-284, 2002.

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0275

HYPERCAPNIA AND DOBUTAMINE HAVE SIMILAR EFFECTS IN SHEEP WITH SEPTIC SHOCK

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INTRODUCTION. Hypercapnia may mediate the release of catecholamines via neuroadrenal stimulation. The aim of this study was to investigate whether hypercapnia has similar effects to dobutamine in sheep with septic shock.

METHODS. 2.5 Kg) anesthetized, mechanically±Twenty-one female (body weight: 27.5 ventilated, hemodynamically monitored sheep received 1.5 g/kg body weight feces intraperitoneally to induce sepsis. Ringer's lactate and 6% hydroxyethyl starch solutions were infused throughout the experiment to prevent hypovolemia. No antibiotics or vasoactive agents were used. Two hours after injection of feces, animals were randomized to one of three equal groups: hypercapnia group - exogenous CO2 was given to maintain PaCO2 55∼65 mmHg; dobutamine group - g/kg/min dobutamine continuous intravaenous infusion; and control group - noμ7 treatment. All animals were studied until spontaneous death.

RESULTS. All animals developed a hyperdynamic phase characterized by hypotension, increased cardiac index and decreased systemic vascular resistance. All had metabolic acidosis with hyperlactatemia. PaCO2 was significantly higher in the hypercapnia group than the other two groups. The hypercapnia and dobutamine groups showed improved mean arterial pressure, higher stroke volume, higher heart rate, higher oxygen delivery and lower lactate concentrations compared with controls (p<0.05). there were no significant differences in any of these variables between the hypercapnic and dobutamine groups. The hypercapnic group had a higher PaO2/FiO2 ratio, lower mean airway pressure and lower wet/dry ratio compared with the other two groups. There was no difference in survival time among the three groups (p = 0.65).

CONCLUSION. Hypercapnia improved gas exchange, decreased pulmonary edema formation, had similar hemodynamic effects as dobutamine infusion in our clinical relevant septic shock model in sheep.

REFERENCE(S). Hypercapnia improved gas exchange, decreased pulmonary edema formation, and had similar hemodynamic effects to dobutamine infusion in our clinically relevant septic shock model in sheep.

0276

ACTIVATED PROTEIN C'S EFFECTS ON PLASMA CYTOKINES DURING ACUTE ENDOTOXEMIA IN PIGS

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INTRODUCTION. Beneficial effects of Activated Protein C (rhAPC) on mortality and morbidity have been demonstrated in patients with severe sepsis and septic shock. rhAPC has antithrombotic, profibrinolytic, anti-apoptotic and anti-inflammatory properties. The anti-inflammatory properties remains relatively unsettled. Aim: By analysing plasma cytokines we tried to asses the anti-inflammatory effects of rhAPC in a porcine model of acute endotoxemia.

METHODS. Eighteen female landrace pigs were subjected to anaesthesia and endotracheal intubation. Group I were subjected to general anaesthesia and lipopolysaccharide (LPS) infusion for 5 h. Group II were exposed to LPS and rhAPC for 5 h. After a stabilization period LPS infusion was started at a rate of 2.5 μg · kg-1 · h-1 and increased stepwise to 15 μg · kg-1 · min-1 during the following 30 min's. For the remaining trial period the infusion continued at a rate of 2.5 μg · kg-1 · h-1. The rhAPC infusion was commenced at 100 μg.kg-1.h-1 15 min before the stabilizing period had ended. Blood for cytokine analysis (IL-1, IL-6, IL-8, IL-10, TNF-α) was collected at -15 min, 60, 120, 180, 240, and 300 min. Measurements of APC, thrombin anti-thrombin(TAT) complex, and PAI-1 were obtained at -15 min, 180 min, and 300 min.

RESULTS. Both groups elicited a marked pro-(TNF-α, IL-1, IL-6 and IL-8) and anti-inflammatory (IL-10) cytokine response, but without significant differences between the groups (TNF-α(p=0.49), IL-6(p=0.60), IL-8(p=0.67), IL-10(p=1.00). PAI-1 levels were significantly lower in the rhAPC treated animals (p<0.01). There was a tendency towards decreased TAT levels in the rhAPC treated group, but this was not statistical significant (p=0.058).

CONCLUSION. No significant effect of rhAPC were seen in plasma cytokine levels. Though PROWESS showed reduced IL-6 plasma levels in septic patients, other human LPS-trials have also showed no effect of rhAPC on plasma cytokines. We showed the pro-fibrinolytic effects of rhAPC as decreased plasma PAI-1 levels. Insignificant TAT-differences could indicate that our study is underpowered or differences in porcine and human coagulationsystems. Conclusion: We did not show any modifying effects of rhAPC on pro- or anti-inflammatory cytokines in this porcine model of acute endotoxemia. Our results suggest that if APC has anti-inflammatory effects these are not elicited through plasma cytokines.

0277

HEMODYNAMIC EFFECTS OF ACTIVATED PROTEIN C

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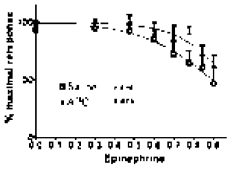
INTRODUCTION. At least two studies using Prowess data demonstrated in the sepsis patients treated with activated protein C (APC) an early improvement in cardiovascular failure as assessed in this slide Thus, it is possible that a part of APC efficiency is due to specific cardiovascular properties

METHODS. We used sedated and ventilated Wistar rats. Monitoring includes the continuous measurements of MAP, abdominal and mesenteric aortic blood flow, muscular laser Doppler and muscle PO2. The measurements also included blood lactate, nitrite and nitrate and TNF. Endotoxin was used at 10 mg/kg and rats were continuously resuscitated with 18 ml/kg/h leading to an hypokinetic model. Three groups were investigated, the first one was treated by 100 μg/kg of APC bolus in the meantime of endotoxin infusion, the second one was treated by 24 μg/kg/h continuously infused and the third by saline.

RESULTS. Continuously infused APC was associated to an improvement in MAP, cardiac output, heart rate, muscular blood flow, muscular PO2 and lactate. Cardiac effects of APC were confirmed using dose response curves with epinephrine and not with phenylephrine. In the APC groups the decrease in CO due to the increase in myocardial afterload was attenuated by APC suggesting that APC improves the answer to beta 1 stimulation as also suggested by a higher heart rate in the APC group.



CONCLUSION. In this experimental model, the association of vasoactive and myocardial effect make APC a unique therapeutic agent.

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0278

THE EFFECT OF PLASMAPHERESIS ON THE CELL MEDIATED IMMUNITY IN SEPSIS

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INTRODUCTION. Plasmapheresis has been used to treat sepsis. Two randomised trials showed no benefit in adult patients with septic shock whereas one randomised trial showed improved survival with plasmapheresis. The effect of plasmapheresis on the cell mediated immunity during sepsis has not been investigated. The aim on the present study was therefore to investigate the long term effect of plasmapheresis on the cell mediated immunity in pigs made septic by endotoxin infusion.

METHODS. 20 pigs were divided into 2 groups. All the pigs were anaesthetized and mechanically ventilated. 10 pigs received 30 microg/kg of Escherichia Coli endotoxin within 20 minutes. 40 minutes later these pigs were treated with plasmapheresis. During plasmapheresis which lasted 4 hours 40 ml/kg bodyweight of the pigs plasma were exchanged with 5% human albumin. 10 pigs received the same bolus of endotoxin and served as a control group. Supportive treatment was continued for 24 hours.
The adhesion molecules CD18, CD44 and CD62L were measured using monoclonal antibodies. The ability to respond with an oxidative burst was measured by means of flow cytometry using 123-dihydrorhodamine. The number of neutrophils was counted in peripheral blood and in lunge tissue. The lymfoproliferative respons and inflammatory cytokines were measured.

RESULTS. The infusion of endotoxin was followed by initial granulocytopenia and later on granylocytosis, activation of CD18, CD62L and increased oxidative burst. The level of cytokines were increased and granulocytes accumulated in lung tissue. Plasmapheresis had no effect at the adhesion molocules (CD18, CD62L), did not influenze on the number of granulocytes and did only slightly reduce the level of cytokines. There was a tendency towards reduced accumulation of granulocytes in the lunges following plasmapherfesis.

CONCLUSION. Though plasmapheresis was initiated within one hour after the induction of endotoxin induced sepsis it did not significantly attenuate the activated cell mediated immunity in sepsis.

REFERENCE(S). Busund et al. Intensive Care Med. 2002:28; 1434-39.

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0279

INHIBITION OF NITRIC OXIDE SYNTHASES IN ANIMAL MODELS OF SEPSIS - A META-ANALYSIS

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INTRODUCTION. Inhibition of nitric oxide synthases (NOS) may be a therapeutic target in sepsis, but increased mortality was the result of a large clinical trial of a non-specific inhibitor of NOS in patients with septic shock (1). The aim of the present study was to identify models of sepsis that may predict the outcome of NOS inhibition in patients.

METHODS. We did a systematic review and meta-analysis of published studies on the effect of pharmacological inhibition of NOS on mortality in animal sepsis. PubMed and Embase were searched and studies of non-specific inhibitors of NOS in sepsis induced by live bacteria were included if mortality data were available. Included studies were graded according to scientific quality.

RESULTS. Eleven studies of a total of 611 animals were included of which 3 were done in large animals and the rest in rodents. Overall the survival rate of sepsis was unaltered by non-specific inhibition of NOS (odds ratio, 95% confidence intervals: 1.1, 0.4 – 2.9), but the design of the studies varied considerably and half of the studies had low quality. There was a tendency of increased survival with NOS inhibition in studies of high quality (3.1, 0.8 – 11.2) and large animals (6.0, 0.7 – 55.9) and decreased survival in studies of rodents (0.7, 0.3 – 1.8).

CONCLUSION. Studies of NOS inhibitory compounds in animal models of sepsis vary considerably in design and quality. This meta-analysis shows that safe conclusions about the predictiveness of a single model for effects in patients cannot be made. Thus extreme caution should be taken if drugs that reduce NO bioavailability are to be tested in septic patients.

REFERENCE(S). 1. Crit Care Med. 2004; 32: 21-30.

0280

TEZOSENTAN IMPROVES DIASTOLIC BUT IMPAIRS SYSTOLIC HEART FUNCTION IN PORCINE ENDOTOXEMIA

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INTRODUCTION. Endothelin-1 (ET-1) plasma levels are increased in sepsis and correlates negatively to cardiac function and survival. The main receptors of the ET system, ETA/ETB, may have differing roles in the myocardial response to sepsis and may mediate certain aspects of myocardial depression. We hypothesized that dual ET receptor antagonism could produce mixed myocardial effects during endotoxemia.

METHODS. 14 anesthetized, mechanically ventilated pigs were subjected to endotoxin-infusion (0.25 mcg/kg/h). Contractile and diastolic function was assessed by left ventricular (LV) pressure-volume analysis (conductance volumetry). After 3 hours of endotoxin, 7 pigs were subjected to tezosentan (TEZO, a dual ET receptor antagonist) at 1 mg/kg/h for 2 hours.

RESULTS. TEZO during endotoxemia caused an increase in cardiac index, decrease in mean pulmonary (MPAP) as well as mean arterial pressure. Left ventricular stiffness (LV end-diastolic pressure/volume) was improved as was isovolumic relaxation (tau). In contrast, systolic function was impaired by TEZO (maximal power/end-diastolic volume, maximal dP/dT/end-diastolic volume, tendency for decrease in preload recruitable stroke work p=0.057)).

TABLE 1.

	0 hours Ctrl vs Tezo	3 hours Ctrl vs Tezo	5 hours Ctrl vs Tezo
Cardiac index (l/min/kg)	136 (±9) vs 138 (±8)	107 (±9) vs 114 (±9)	106 (±4) vs 140 (±9)**
MPAP (mm Hg)	22 (±1) vs 20 (±1)	42 (±2) vs 41 (±2)	40 (±3) vs 23 (±1)**
LV stiffness (mm Hg/ml)	0.11 (± ,01) vs 0.12 (± ,01)	0.10 (± ,01) vs 0.11 (± ,02)	0.13 (± ,01) vs 0.10 (± ,01)*
Tau (ms)	34.8 (±2.2) vs 40.9 (±3.2)	42.1(±3.2) vs 41.6 (±1.4)	41.6 (±2.3) vs 34.6 (±1.7)*
PWR_{max}/EDV (mm Hg/s)	323 (±17) vs 345 (±29)	439 (±67) vs 359 (±72)	409 (±55) vs 262 (±41)*

*p<0.01:**; p<0.05:* Error as SEM. Statistics: ANCOVA*

CONCLUSION. During acute porcine endotoxemia, dual ET-1 receptor antagonism by tezosentan improves left ventricular stiffness, tau, cardiac index and pulmonary hypertension, while systolic function appears to be simultaneously impaired. For therapeutic implications, dual ET-1 receptor antagonism during sepsis needs further investigation.

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0281

EFFECTS OF TYROSINE KINASE OR PHOSPHATASE INHIBITION IN LPS-INDUCED VASCULAR HYPOREACTIVITY

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INTRODUCTION. One of the main characteristics of endotoxemia is vascular hyposensitivity that is partially caused by the excess of nitric oxide (NO). At present, satisfactory therapeutic measures that would restore vascular hyporeactivity of sepsis are not available.

METHODS. We tried to modulate the sensitivity to phenylephrine (PE) of the lypopolysaccharide (LPS, 10^{-4}g/ml, 6 h) incubated rat aortas in vitro (n=8 per group), by selectively inhibiting either the nitric oxide pathway, or tyrosine kinase or phosphatase activity.

RESULTS. Endothelium denudation of the vessels (–ENDO) increased vascular sensitivity to PE as compared to the controls (Cont). Pre-incubation of LPS vessels with nitric oxide production inhibitor, L-NAME ($5x10^{-4}$) and cGMP inhibitor, ODQ ($5x10^{-5}$), but not with cAMP inhibitor, SQ, abolish LPS-induced hyposensitivity (EC_{50}, –log, M: +Endo, LPS; Cont: 6.11 ±0.09, vs. L-NAME: 6.91 ±0.07; ODQ: 7.38 ±0.05: P<0.001). Genistein (tyrosine kinase inhibitor, GEN) produced, in preparations +ENDO (LPS and non-LPS) and in –ENDO (LPS), a concentration depended attenuation of maximal tension (Tmax) while it had no influence on sensitivity to PE. The sodium orthovanadate (SOV) pre-incubation produced increased sensitivity to PE of the LPS preparations which was concentration dependent (EC50: +LPS, +ENDO; Cont 6.68 ±0.17 vs. SOV: 10^{-4}, 6.76 ±0.14; $5x10^{-4}$, 6.83 ±0.13; 10^{-3}, 6.93 ±0.14). Pre-incubation with SOV also increased Tmax in –ENDO (LPS) preparations (Tmax: Cont 0.5 ±0.04 vs. SOV: 10^{-7}, 1.26 ±0.15; 10^{-6}, 0.64 ±0.097; 10^{-5}, 1.08 ±0.13; 10^{-4}, 0.4 ±0.09; $5x10^{-4}$, 0.42 ± 0.1; 10^{-3}, 1.08; ± 0.33; kg/g dry muscle).

CONCLUSION. We confirmed that excess of nitric oxide may be one of causes of the LPS-induced vascular hyposensitivity in vitro. However, tyrosine phosphorylation pathway may play an important role in modulation of the LPS induced vascular hyposensitivity. It should be further examined whether this could have therapeutic consequences.

0282

MICROCIRCULATORY EFFECTS USING HIGH MOLECULAR HYDROXYETHYL STARCH SOLUTIONS IN A PORCINE FAECAL PERITONITIS

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INTRODUCTION. Microcirculatory alterations result into inadequate tissue oxygenation and multi organ dysfunction during severe sepsis and septic shock. It seems to be important to guarantee adequate volume replacement in sepsis in order to improve the microcirculatory flow. Using an established faecal peritonitis model we tested the effects of two new synthetic high molecular hydroxyethyl starches HES 700/0.42/2.5:1 (HES700/2.5:1) and HES 700/0.42/6:1 (HES700/6:1) compared to HES 130/0.42 (HES130) and ringer's solution (RS) on tissue oxygenation (StO2), microvascular reactivity and gastrointestinal CO2 gap.

METHODS. Prospective randomised, controlled animal study. 25 anaesthetised, ventilated pigs (28.4±2.3 kg) were randomised (5 each group) to volume replacement therapy with colloids, RS or a non-septic control group receiving RS. Animals in the septic groups received 1g/kg/body weight faeces into abdominal cavity to induce sepsis. Infusion rate was titrated to maintain a central venous pressure of 12 mmHg. Quadriceps muscle StO2 was measured by NIRS using the artery occlusion method. Microvascular reactivity alterations was evaluated by the calculation of the slope of the decrease in StO2 (decslope [%/sec]) and the calculation of the slope of the increase in StO2 (incslope [%/sec]) during and after the the ischemic period. The CO2 gap was determined with an oral tonometry catheter in the stomach (PgCO2) and one placed in the ileum (PiCO2). Time points: Baseline (bl) and 8h after induction of sepsis. Statistics were performed using ANOVA.

RESULTS. The PiCO2 [mmHg] was at study end significantly higher in the RS group [68.8±8.8] compared to HES130 [41.3±14.5], HES700/2.5:1 [40.6±14.5] and control [40.8±8.6]. There were no significant differences in the PgCO2 between the groups [RS 18.0±11.3; HES130 11.0±4.7; HES700/2.5:1 16.8±15.0; HES700/6:1 8.8±6.8; control 8.8±1.3]. StO2 analysis showed no differences in the incSlope and decSlope between the groups. The relative change [% of bl] in StO2 in RS group [33.1±14.8] was significant higher than in control [3.8±1.7].

CONCLUSION. In this porcine faecal peritonitis model the artificial colloids HES 130, HES700/2.5:1 and HES 700/6:1 could maintain tissue oxygenation in the quadriceps muscle significantly better than RS. Additionally microcirculation in the ileum maybe impaired using RS compared to HES130 and HES 700/2.5:1.

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0283

EX-VIVO DEMONSTRATION OF ENHANCED VASCULAR REACTIVITY TO VASOPRESSIN IN PROLONGED SEPTIC SHOCK

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INTRODUCTION. In patients, prolonged septic shock is associated with a decreased pressor response to norepinephrine (NE), but an enhanced sensitivity to vasopressin (VP). The mechanism underlying the latter is unknown. We used a long-term, conscious, fluid-resuscitated, rodent model of faecal peritonitis to reproduce this clinical scenario, and then measured *ex-vivo* contractile responses to NE and VP in resistance vessels taken from the same animals.

METHODS. Male Wistar rats (300g) were anaesthetized for insertion of arterial and central venous lines, attached to a tether to permit free movement. The following day, sepsis was induced by intra-peritoneal injection of faecal slurry. Paired sham controls received no injection. A 50:50 colloid:crystalloid mix was infused at 10 ml/kg/hr. 24 hours later blood pressure responses to iv infusions of NE (2.5mug) and VP (0.017IU) were measured. Animals were then culled, and mesenteric resistance arteries (200mum i.d.) dissected and mounted on a wire myograph for assessment of isometric contractions to NE and VP.

RESULTS. Septic animals became clinically unwell and hypotensive with respect to the sham controls. The *in-vivo* response to NE was significantly depressed in the septic group (p=0.003) in contrast to that to VP (p=ns)(Table 1). This difference in drug effect was amplified in *ex-vivo* septic vessels, with significantly depressed efficacy of NE (p=0.005) but increased sensitivity to VP (p=0.003) (Table 2). The morphology of the contractile responses differed in the septic vessels, with sustained tension seen following VP but only transient contraction with NE. This strongly suggests underlying alterations in Ca^{2+} mobilisation.

TABLE 1.

In-vivo mean arterial BP increase (mmHg)

	Sham (n=7)	Septic (n=4)
NE	34.9 ± 4.2	3.7 ± 3.7
VP	33.1 ± 4.6	12.0 ± 6.2

values are mean ± SEM

TABLE 2.

Wire myography ex-vivo

	Efficacy N/m Sham (n=9)	Efficacy N/m Septic (n=6)	Sensitivity pEC_{50} Sham (n=9)	Sensitivity pEC_{50} Septic (n=6)
NE	4.69 ± 0.24	2.96 ± 0.45	5.60 ± 0.04	5.49 ± 0.06
VP	5.00 ± 0.21	5.18 ± 0.34	8.74 ± 0.05	9.05 ± 0.06

values are mean ± SEM

CONCLUSION. This is the first *ex-vivo* demonstration of concurrent VP hypersensitivity and NE hyporeactivity in blood vessels taken from a clinically realistic septic animal model. We hypothesize that VP and NE utilise different Ca^{2+} mobilisation pathways, and that modulation of these in sepsis is responsible for the observed results. We will therefore use this approach to further examine VP and NE signalling at both tissue and cellular levels.

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0284

HYPERBARIC OXYGEN THERAPY FOR CARBON MONOXIDE POISONING DURING PREGNANCY

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INTRODUCTION. Carbon monoxide (CO) poisoning is a significant problem in Poland. Nonspecific spectrum of symptoms cause that many cases of poisoning are not recognized. CO poisoning is not common in pregnancy and can be easy unrecognized. It may have many adverse effects both to the mother and fetus. CO is fetotoxin and teratogen. Safety and efficacy of HBO2 in the treatment of pregnant women is not well established. The aim of this article is assess safety of HBO2 in the treatment of pregnant women with CO poisoning and the influence of HBO2 on time of delivery and children delivery in 1 year observation period.

METHODS. Record of patient treated with HBO2 for acute CO poisoning in Hyperbaric Oxygen Therapy Unit, Wroclaw Medical University, from January 2004 to January 2006 were collected and analysed. Symptoms of poisoning, approximate time of exposure, and time from the end of exposure to start HBO2 were analysed. Data of the time of delivery, Apgar scale were collected. Children delivery were assessed using standard protocols for 1 year old children in Poland.

RESULTS. From January 2004 to January 2006 57 patient were treated with HBO2 for CO-poisoning. There were 5 pregnant women in this group. The diagnosis was made on the basis of medical history and symptoms and eleveted COHb level. The mean age of pregnants was 29 years (23-33), mean gestational age – 32.25 hbd (22-38hbd). Symptoms: loss of consciousness in 4 cases, which lasted 3 minutes, 5 minutes, 15 minutes, 1 hour, respiratory insufficiency which demand intubation and mechanical ventilation for over half hour in one case, headache, and retrograde amnesia in all cases. Time from estimated exposure to HBO2 varied from 45 minutes to 4 hours (mean 2.44 hours). The reason of this was: 3 women were transported to our unit from others hospitals. The fetal CTG showed unprovoked decelerations to 100 bpm in 4 cases, and marked bradycardia in 1 case. Breathing with 100% oxygen was administered on the field, and patient were transported to our unit by ambulances. Patients were treated with HBO according to our protocol (1x2.8 ATA–90 minutes, 2x2.5 ATA-90 minutes in the first 24 hours. Then patients were observed in the Department of Toxicology, and consulted by obstetricians every 24 hours (CTG) for 7 days. All patients delivered in term at: 2x39, 2x40, 41 weeks gestation. The Apgar scores were 9 points in 1st minute and 10 points in 10th minutes after delivery in all cases. In one year observation all children have developed promptly.

CONCLUSION. 1. HBO2 is the treatment of choice for CO poisoning and all pregnant women suffering CO intoxication should be referred for HBO2 therapy (irrespective to maternal symptoms and maternal COHb level).
2. HBO2 is safe and well tolerated by fetus.

0285

A 12 MONTH RECORDING OF ADVERSE DRUG EFFECTS CAUSED BY COMMONLY USED ANTIMICROBIALS IN AN ICU

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INTRODUCTION. Antibiotics represent one of the most commonly prescribed drug classes in the Intensive Care Unit setting (1,2). Several side effects are therefore noticed. Our main purpose was to record the prevalence of side effects of commonly used antimicrobials in our unit.

METHODS. During a twelve – month period (1/1/2005 – 31/12/2005), all antibiotics side effects which were noticed in patients hospitalized in our 10 bed multivalent ICU were prospectively recorded.

RESULTS. During this year one hundred seventy two patients were admitted in our Unit. There were 88 men and 84 women. Their mean age was 51 $\pm$ 20.2 y. Adverse side effects were noticed in 12 patients (7%). Seventy four patients were treated with piperacillin / tazobactam. Four between them (5.5%) presented an eruption. None of them had a history of allergic reactions to any antimicrobial. After the drug was interrupted and antihistamines were given the eruption disappeared. Among sixty eight patients who received imipenem / cilastatin three presented side effects (4.4%). The first patient presented seizures, another one presented neutropenia and the third an allergic skin eruption. In the first case, seizures were attributed to a long duration of therapy while neutropenia in the second case to an overdose of the drug. Finally among 45 patients treated with linezolid, five (11%) presented severe thrombocytopenia (mean PLT number 22.000 / dl). Number of platelets continued to diminish for some time after the drug interruption. Thrombocytopenia appeared after a mean period of 8.8 $\pm$ 4.6 days. Platelets returned to normal slowly after an average of 12 days.

CONCLUSION. ICU physicians must remain aware of the fact that adverse side effects of antimicrobial drugs are not very rare. Attention must be paid so that the responsible drug is interrupted on time and more severe consequences are avoided.

REFERENCE(S). (1) APMIS 1999 Nov; 107 (11) : 989 – 96. High antibiotic consumtion in Danish Intensive Care Units? Petersen IS, Hesselberg L, Jorgensen L et al.
(2) Dancer S J, Coyne M, Robertson C, Thomson A, Guleri A, Alcock S. Antibiotic use is associated with resistance of environmental organisms in a teaching hospital. J. Hosp. Infect Control 2005 Apr; 33 (3) : 157 – 61.

0286

MANAGEMENT OF PATIENTS ON THE WARDS PRIOR TO EMERGENCY ADMISSION TO CRITICAL CARE

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INTRODUCTION. Recent publications have suggested sub-optimal ward management of patients referred to critical care services (1,2) which is associated with an increased mortality (1). Our audit looked at the adequacy of resuscitation and antibiotic therapy prior to admission to ICU. We felt that patients were often being admitted late to ICU and had been sub-optimally managed on the wards. Our aim was to quantify the extent of this problem.

METHODS. This was a prospective audit on the ICU in a large teaching hospital. The notes of every emergency admission directly from the ward over a six months were reviewed. The ward care prior to involvement of the critical care team was assessed by a questionnaire focusing on the recognition and management of clinical deterioration. We aimed to objectively assess resuscitation in terms of airway, breathing and circulation. Medical management was considered optimal if basic therapies appropriate to their underlying illness had been instituted. Where appropriate antibiotic therapy should have been commenced.

RESULTS. The notes of 56 patients were audited. A summary of the adequacy of resuscitation is presented in Table 1. Basic medical management was considered adequate in only 68% of patients. Antibiotics were considered appropriate in 73%. Only 90% of these had antibiotics prescribed and only 22% had been written up for a stat dose. There was a discrepancy of between 1 to 4 hours between the prescribed dose and administered times.

TABLE 1.
Adequacy of resuscitation prior to ICU admission

	% patients therapy indicated	% patients therapy performed
AIRWAY: airway adjunt / oxygen	34% airway adjunt/ 100% oxygen	58% airway adjunt / 93% (71% adequate FiO2)
BREATHING: phyisiotherapy/ NIV	46% physiotherapy / 46% NIV	46% physiotherapy / 46% NIV
CIRCULATION: fluid therapy	89% maintenace / 66% resuscitation fluids	48% maintenance/ 22% resuscitation fluids

CONCLUSION. Our findings confirmed that resuscitation, management and antibiotic therapy before ITU admission are often sub-optimal. Reasons for this are lack of recognition of clinical deterioration, failure to start appropriate therapy and lack of senior medical input. Although there is an element of subjectivity in such assessment our results support recent findings (1,2). More education of ward staff in the recognition and management of acute illness is required.

REFERENCE(S). 1. McQuillan P, Pilkington S, Allan A et al. BMJ 1998; 316: 1853-1858; 2. Cullinane M, Findlay G, Hargreves C et al. An Acute Problem. London: NCEPOD, 2005.

0287

S-100B AND NSE AS PREDICTORS OF NEUROLOGICAL OUTCOME IN HYPOTHERMIA TREATED CARDIAC ARREST PATIENTS

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INTRODUCTION. Early prediction of neurological outcome after cardiac arrest is essential to avoid futile intensive care. Induced hypothermia as a post cardiac arrest neuroprotective strategy demands sedation, making a clinical neurological exam unreliable. We conducted a prospective trial of the neurobiochemical markers S-100b and NSE as tools for predicting neurological outcome in hypothermia treated cardiac arrest patients.

METHODS. NSE and S-100b were measured in serum at 2+/-1h, 24+/-4h, 48+/-4h and 72+/-4h after cardiac arrest in patients with mixed initial rhythms and different locations of cardiac arrest. All patients were treated with induced hypothermia (33˚C for 24h and a slow rewarming 0.5˚C/h). After sedation was withdrawn the patients were evaluated neurologically. In patients who remained deeply unconscious (GCS 3-4) 72h after the time point when normothermia was reestablished, active treatment was withdrawn. All patients were evaluated according to the Cerebral Performance Categories (CPC) scale when leaving the ICU, before leaving hospital and 6 months after cardiac arrest. A CPC of 1-2 at any time was considered a good outcome.

RESULTS. 104 patients, 86 in whom NSE were evaluated, were included from August 2002 until August 2005. The patients had a mean age of 63 years, 70% were male. 84% had out-of-hospital cardiac arrests; the initial rhythm was VF/VT in 62%, Asystole/PEA 35% and unknown in 3% of the patients. 47% of the patients were classified as having good outcomes. With an S-100b cut off of 0.55 at 24h we reached a specificity of 93% with a sensitivity of 53% for bad outcome. NSE values of 24 (24h) and 27 (48h) resulted in a specificity of 100% and a sensitivity of 49% and 70% respectively. The early values of S-100b showed a large range independent of good (0.11-3.1) or bad (0.38-11) outcomes.

CONCLUSION. The best markers for neurologic outcome in this mixed group of hypothermia treated cardiac arrest patients were an S-100b level of 0.55 at 24h or a NSE of 27 at 48 h. Low levels of S-100 at any time should be interpreted cautiously due to low sensitivity, and initial S-100 levels were unreliable from a prognostic point of view.

0288

OUR EXPERIENCES ON ORGANOPHOSPHATE INSECTICIDE POISONING IN INTERNAL MEDICINE INTENSIVE CARE UNIT

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INTRODUCTION. Organophosphate (OP) insecticides inhibit both acetylcholinesterase and pseudocholinesterase activities. The clinical course of OP poisoning may be quite severe and may need intensive care management. We report our experience with the intensive care management of serious OP insecticide poisonings.

METHODS. A retrospective study was performed on the patients with OP poisoning followed at our medical intensive care unit. Sixty-one patients were included. Diagnosis was performed from the history taken either from the patient or from the patient's relatives regarding the agent involved in the exposure. Intravenous atropine and pralidoxime was administered as soon as possible. Pralidoxime could not be given to 18 patients: 2 patients did not receive pralidoxime because they were late admissions, and 16 did not receive pralidoxime because the Ministry of Health office was out of stock. Data are presented as mean ± standard deviation.

RESULTS. There were 32 female and 29 male patients. Fourty (65.57%) were suicide attempts and 21 (34.43%) were accidental exposure patients. The mortality rates for the patients who did and did not receive pralidoxime were 30.2 and 16.7%, respectively and were not statistically different. Sixteen patients (26.23%) required mechanical ventilation. The mortality rate for the patients who required mechanical ventilation was 50%, but the rate was 17.8% for those patients who were not mechanically ventilated. Intermediate syndrome was been observed in 11 (18.03%) patients. Complications were observed in 40 (74.4%) patients. The duration of the intensive care stay was 5.80 ± 3.37 days.

CONCLUSION. OP insecticide poisoning is a serious condition that requires rapid diagnosis and treatment. Because respiratory failure is the major reason for mortality, careful monitoring, appropriate management and early recognition of this complication may decrease the mortality rate among these patients.

REFERENCE(S). 1. Oztürk M A, Kelestimur F, Kurtoglu S, Guven K, Arslan D. Anticholinesterase poisonings in Turkey - clinical, laboratory and radiologic evaluation of 269 cases. Hum Exp Toxicol 1990, 9: 273–279.
2. Namba T, Nolte C T, Jackrel J, Grob D. Poisoning due to organophosphate insecticides. Acute and chronic manifestations. Am J Med 1971, 50:475–492.

0289

AN INTENSIVIST IN THE EMERGENCY DEPARTMENT: TOWARDS COMPREHENSIVE CRITICAL CARE

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INTRODUCTION. There has been an increasing concern among intensive care physicians with timely diagnosis and intervention in critical illness. The interface Emergency- Intensive Care Unit is in focus as an area for possible improvement. Hospital of S. João is a tertiary referral academic center with more than 160000 admissions a year to the Emergency Department. Of these, a small proportion is critically ill or trauma patients and enters in a 5-bed space called "Emergency Room" (ER) where are also admitted hospital inpatients with clinical deterioration. An Intensivist from the Intensive Care Service works in the Emergency Department in a weekly-based Rota with responsibility for directing the overall plan of care for these patients, for triage decisions and intensive care allocation. The purpose of this study was to assess whether care provided by an intensivist to critically ill patients in the ED has a positive impact in the process of care in terms of time-effectiveness and diagnostic and treatment expertise.

METHODS. Retrospective study of admissions to the ER from January to December 2005 as registered in the written log. Data collected included: origin of the patient, length of stay, and destination in terms of admission to Intensive Care Units, special care units, operating room, general ward, death or discharge.

RESULTS. In 2005 there were 2789 patients entering ER (of those, 513 where major trauma patients and were assisted by the Trauma Team). The other 2276 patients included 1437 (63, 1%) coming from the community; 324 (14, 2%) were inter-hospital transfers; 359 (15, 7%) came from in-hospital wards and 156 (6.8%) from Intermediate Care Units. Patients were assessed regarding indication for ICU admission. When life support treatment was withheld, strategies for palliation of symptoms were implemented on site. The mean length of stay was 5.8 hours. It's possible that this space functions as a buffer to lack of beds in either intensive or intermediate care units expending resources and leading to overcrowding. Only 11% of the patients (384) were admitted to Intensive Care Units. Opportune and efficient treatment may have averted many ICU admissions. Patients admitted to Intermediate Care Units – 844 (37%); to general wards – 336 (14.7%); to operating theatre – 135 (5.9%). Two hundred ninety eight patients (13%) died.

CONCLUSION. Having an intensivist in the front line of admission of critically ill patients is highly cost-effective. It extends the ICU model of care to the ED with focus in the level of care the patient needs regardless the location he is.

0290

THE BRAIN DEATH DETECTION WITH THE BISPECTRAL INDEX

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INTRODUCTION. Objetivo: To evaluate the BIS (Bispectral Index Scale) monitor as a method of brain death (BD) detection.

METHODS. Observational prospective study. Intensive care unit (ICU) of a university hospital. Patients hospitalized in a non consecutive way in the intensive care unit, with a serious neurological pathology and evolution towards a brain death. A BIS monitor, XP model and the sensor "BIS Quatro" were used. The BIS values were continuously recorded: suppression ratio (SR), quality of the signal index (QSI) and electromyographic (EMG) activity.

RESULTS. 33 patients (19 male). Ages ranged from 34 to 76 years (mean 62, 6). Aetiology of BD: 7 traumatic brain injury, 9 intracerebral hemorrhage, 13 subarachnoid hemorrhage and 4 stroke. E. Glasgow mean on admission in ICU was 4.9 (3-13). The 4 patients with stroke NIHSS Scale of 30, 21 and 19. The BD diagnosis was made through neurologic clinical exploration and electroencephalogram (EEG) in all the cases. Additionally, the transcranial Doppler (TD) was used in 23 patients (70%). Coinciding with the clinical worsening, it was observed that there was a gradual decrease of the BIS value, together with a raise in the SR. In all the patients in which the BD diagnosis was confirmed, the BIS showed values of 0 and suppression rates of 100. Only one patient showed interferences, due to electromyographic activity, being the same problem detected when doing a conventional EEG. After using a neuromuscular blocker, the values of BIS and SR were of 0 and 100 respectively. 1 patient, with BIS of 0, and atrial fibrilattion, during apnea test, presented a cardiac frequency of 170 bpm and increasing of BIS until values of 20. In 3 cases, with BIS of 0 the cough reflex persisted between 30 minutes and 5 hours.

CONCLUSION. The BIS is a non invasive method, simple and easy to interpret. All the patients with DB diagnosis, except for one, had a BIS value of 0 and TS of 100, showing a perfect correlation with the other methods of diagnosis used. False negatives transient can be observed by electromiographic interference and electrocardiogram artifact. The BIS cannot be used on its own for the confirmation of the BD, but it is a very useful tool in order to detect the beginning of brain herniation.

0291

OSMOTIC DEMYELINATION SYNDROME: AN ICU EXPERIENCE OF A TERTIARY CARE CENTRE

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INTRODUCTION. Dyselectrolytemia is common in hospitalized patients and hyponatremia (Serum Na <135 meq/l) is the commonest electrolyte disturbance encountered in critically ill patients. An association between osmotic demyelination syndrome (ODS) and the rapid correction of sodium in hyponatremic patients was established almost three decades back. We present a retrospective analysis of ten patients with the diagnosis of central pontine myelinolysis (CPM) and extra-pontine myelinolysis (EPM).

METHODS. A retrospective analysis of medical records of ten patients diagnosed with ODS was done during their stay in our intensive care unit (ICU) over a period of three years. We reviewed the clinical features, etiology and clinical outcome of these patients

RESULTS. Study included ten patients ranging in age from 12-71yrs (mean age-32yrs) with male female ratio of 4:6. Worsening of sensorium was the most common presenting neurological symptom (40%) at the time of admission to our ICU followed by new onset of alteration in sensorium (20%), seizures (20%) and generalized motor weakness (20%). Mean admission APACHE II was 12. Malnutrition (30%) and prolonged diuretic therapy (30%) were the most common predisposing factors. All patients were of chronic hyponatremia (>48hrs) with serum sodium less than 120 meq/l. In all patients the rate of correction of sodium was more than 10 meq/l/24 hours. Hypokalemia was the most common associated biochemical abnormality (60%) followed by hyperglycemia (20%), hypophosphatemia (20%) and elevated serum creatinine (20%). MRI was done in all patients after two weeks of first detection of hyponatremia. Imaging revealed CPM in 5 patients, EPM in 3 patients and both CPM and EPM in 2 patients. Only two patients had complete neurological recovery at ICU discharge (22%). Two patients were discharged in vegetative state, 2 patients died during the ICU stay due to intercurrent complications and 4 patients were discharged with moderate neurological recovery.

CONCLUSION. Osmotic demyelination syndrome is a complication of treatment of patients with life threatening hyponatremia. Outcome remains poor as majority (75%) of survivors in our series remained dependent for self care even after six months. Length of ICU stay and hospital stay were prolonged Recognizing the patient at risk (malnutrition, associated illnesses, patients requiring aggressive fluid therapy); preventing rapid correction of hyponatremia (>8 meq/l/24 hours); optimal correction of associated biochemical abnormalities especially concurrent hypokalemia and good holistic intensive care can reduce the incidence and improve the outcome of this syndrome

0292

PERSISTENT HIGH MORTALITY IN SEPTIC PATIENTS WITH SUSPICION OF CRITICAL ILLNESS POLYNEUROPATHY

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INTRODUCTION. Neuromuscular abnormalities are common in critically ill patients with systemic inflammation and organ failures. For the diagnosis of critical illness polyneuropathy (CIP), electrophysiological tests are recommended but frequently not available. We aimed to assess the incidence of clinically diagnosed CIP and its potential impact on length of hospital stay and mortality.

METHODS. 30 consecutive critically ill patients on mechanical ventilation for 48 hours and with the presence of greater than or equal to 2 SIRS criteria were prospectively studied. Clinical neurological examinations were performed daily during sedation stop. Clinical diagnosis of CIP was defined as symmetric limb muscle weakness with no explanation other than CIP (e.g. myasthenia gravis, Guillain-Barré syndrome, prolonged effect of sedation) in patients with normal neurology at ICU admission.

RESULTS. CIP was diagnosed clinically in 11 patients (37%). 10 patients (33%) had sepsis and 5 of them also had CIP (50%).

TABLE 1.
Demographic data of included patients

	All patients (n=30)	CIP+ (n=11)	CIP- (n=19)	P
Age	72 (25-84)	76 (25-84)	68 (32-82)	0.047
SAPS II	33 (15-99)	30 (21-61)	37 (15-99)	0.550
SOFA 1st day	9 (5-17)	8 (5-12)	10 (5-17)	0.138
ICU Days	12 (4-31)	15 (8-22)	9 (4-31)	0.015
Ventilator Days	9 (3-27)	12 (10-18)	6 (3-27)	0.002
Mortality (%)	33	46	26	0.074

CONCLUSION. CIP was diagnosed frequently in this patient group, and despite similar SAPS II and SOFA scores as compared to patients without CIP, these patients remained longer on mechanical ventilation and in the ICU and had a high mortality.

0293

INTRACRANIAL PRESSURE VARIATION DURING PERCUTANEOUS DILATIONAL TRACHEOSTOMY

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INTRODUCTION. Neurocritical patients represent the most important group which need a tracheostomy to receive long term mecanichal ventilation (MV). Percutaneous technique has been shown as the elective one, but the safety profile and the timing to perform it have still to be defined. This group is very sensitive to changes in the intracranial pressure (ICP), cerebral perfusion pressure (CPP) and ventilation. This study tries to define these variations as well as the role of the association of fever (F), use of vasoactive drugs (UVD), tracheal cuff puncture (TCP), endoscopy (E) and ventilatory mode (VM) during the procedure.

METHODS. We studied prospectively 64 neurocritical patients under monitorization of the ICP, invasive mean blood pressure (MBP), arterial oxygen saturation (SaO2) and end-tidal pCO2 (pCO2et). The method of Ciaglia with the succesives technological improvements of the percutaneous dilational tracheostomy (PDT) was chosen, associating endoscopic view occasionally (just to verify the appropriate position of the wire) in the patients with difficult anatomic references. The patients were under general anaesthesia and MV with FiO2:1 and PEEP<10 cm of water. The moment to perform it was designed by consensus once the patient was hemodinamically and respiratory stable and without intracranial hypertension crisis. The variables are expressed as mean and standard deviation.

RESULTS. We collected 44 male and 20 female of 50±16 years old, APACHE II at admission of 22±4 and 16±3 at the date of the tracheostomy. They were under MV for 9±5 days before the PDT. During the procedure the worst values for SaO2, ICP, MBP, CPP and pCO2et were respectively 97±2%, 21±3, 87±6, 72±6 and 38±4 mmHg. The fall in SaO2, MBP and CPP during the PDT were 2±2%, 10±4 and 9±3 mmHg. The highest elevations of the ICP and pCO2et were 15±3 and 5±2 mmHg. All of them were brief and easily corrected. The procedure lasted 20 min or less. Neither F, nor E, UVD or TCP have contributed to make worse the monitorized values. Only the VM affected negatively the oxygenation in patients under PCV, with a fall in the SaO2 (RR 95% CI: 1.38-3.94, p<0.0001).

CONCLUSION. The PDT performed as in our study has been shown, a safe procedure with brief and easily corrected variations without clinical impact of the monitorized parameters. Fever, UVD, F, TCP and E didn't worsen significantly the measured variables, like the VM did. Patients ventilated under PCV were significantly worse oxygenated.

0294

AUDIT OF INSERTION OF ICP MONITORS BY CRITICAL CARE TECHNICIANS

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INTRODUCTION. Changes in postgraduate education in the UK have resulted in fewer, less-experienced, doctors being available on the ICU. To ensure that service provision is maintained, we have trained critical care technicians (CCTs) to insert intracranial pressure (ICP) monitors. CCTs also supervise insertion of ICP monitors by junior medical staff. This aims to release senior medical staff to perform other tasks

METHODS. CCTs underwent internationally-recognised training in the insertion of ICP monitors. Following this, CCTs undertook local, supervised training and assessment. Time from request to ICP monitor insertion was recorded, along with number of attempts. Notes were reviewed for 7 days post insertion for any complications. Supervision of junior doctors was performed by CCTs using a standardised training programme and competency-based assessment tool.

RESULTS. 165 consecutive ICP monitor insertions were audited over a 5 month period. 145 of these were considered urgent. No statistical differences were noted in the time taken to insertion between operators. No episodes of local infection or intracranial bleeding were recorded.

TABLE 1.

Time taken for insertion of ICP monitor

	No. inserted	< 30 mins	30-60 mins	60-120 mins	>120 mins	unknown
Consultant	2	1				1
Specialist Registrar	146	31	32	42	38	3
SHO (with CCT)	6	0	1	2	3	
CCT	11	2	5	2	2	

CONCLUSION. Insertion of ICP monitors by CCTs or by junior medical staff under supervision by CCTs may allow senior medical staff to be utilised for other tasks. This may also shorten the patient's journey time if there is a delay in attendance by senior staff. Complications rates were low for all operators.

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0295

EXPERIMENTAL EVALUATION OF THE CROSS-CORRELATION METHOD FOR CEREBRAL AUTOREGULATION MONITORING.

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INTRODUCTION. Cerebral autoregulation (CA) monitoring might enable us to optimise the therapy of severe traumatic brain injury. The non-invasive cross-correlation method uses slow spontaneous oscillations of arterial blood pressure (ABP) and middle cerebral artery flow velocity (FV) for continuous measurement of CA. The aim of this study was to evaluate the cross-correlation method in a pig model of acute subdural hematoma coupled with autoregulatory disturbance. The static rate of regulation (sROR, [1]) was used to confirm the status of CA.

METHODS. After approval by the local ethics committee 12 male pigs (30 kg) were anesthetized, intubated, mechanically normoventilated and craniectomized. We continuously measured ABP, intracranial pressure, and bilateral FV by Doppler sonography. At baseline (intact CA), the time delay at the positive maximum of the cross-correlation function between low-pass filtered (0.1 Hz) ABP- and FV-oscillations was calculated and averaged over 10 minutes. For the calculation of sROR [1], ABP was elevated about 20% of baseline values by continuous infusion of arterenol. After recovery of ABP, a unilateral subdural hematoma was induced by autologous blood injection. To reach autoregulatory failure, the injection was continued until cerebral perfusion pressure persistently remained below 50mmHg. Calculation of the time delay and sROR was repeated. Wilcoxon tests were used for statistics.

RESULTS. The trauma led to significant disturbance of CA (mean sROR before trauma 1.0 ± 0.4, afterwards 0.2 ± 0.4 (p<0.01)). Cross-correlation analysis detected failure of CA (mean time delay before trauma -2.9 ± 1.4s, afterwards +0.5 ± 0.7s) and significantly correlated with the sROR (Spearmans rho -0.58, r^2= 0.34, p<0.01).

CONCLUSION. The applied model is useful to study CA measurement methods. Cross-correlation analysis can reliably distinguish between an intact and impaired CA. As the method is non-invasive, it is suitable for clinical monitoring.

REFERENCE(S). [1] Tiecks F P, Lam A M, Aaslid R, Newell D W. Comparison of static and dynamic cerebral autoregulation measurements. Stroke 1995; 26: 1014-1019.

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0296

MICRODIALYSIS PARAMETERS IN THE PROGNOSIS OF INTRACEREBRAL HEMATOMAS

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INTRODUCTION. To investigate the association between the microdialysis parameters and the outcome in patients with spontaneous intracerebral hematomas

METHODS. 30 patients with a mean age of 59 ± 10 years and GCS<=12 were included in this prospective study. Their outcome was evaluated with the GOS in 6 months. The patients were under multimodal brain function monitoring (ICP-CPP and ptiO2 measurements and a microdialysis catheter). The microdialysis samples were collected every two hours and were automatically analyzed.

RESULTS. From the patients included, 22 (73.33%) had favorable outcome (GOS=4,5) and the remaining 8 (26.67%) unfavorable outcome (GOS=1,2,3). The two groups were similar, in terms of patient's age and gender, initial GCS score and therapeutic interventions. The group of patients with the favorable outcome had lower glucose, lactate, lactate/pyruvate ratio and glycerol values, and higher pyruvate values comparing to the group with the unfavorable outcome. None of these differences reached statistical significance, with the exception of the differences in mean lactate and maximum lactate values, which were indicative (table 1).

TABLE 1.
Microdialysis paremetrs in patients with spontaneous intracerebral heamatomas

Parameter	Favorable Outcome	Unfavorable Outcome	p-value
Mean glucose values	0.633 (0.553-0.806)	1.05 (1.17-0.672)	0.143
Mean glycerol values	50.233 (31.78-55.96)	39.314 (30.34-89.36)	0.673
Maximum glycerol val	220.07 (167.3-248.6)	264.67(170.57-788.4)	0.464
Mean lactate values	4.31 (2.944-4.81)	5.27 (4.077-7.021)	0.083
Maximum lactate valu	7.133 (4.521-9.334)	9, 62 (7.751-15.83)	0.075
Mean pyruvate values	125.99 (93.43-153.5)	136.27 (99.84-172.5)	0.495
Mean L/P ratio value	34.076 (30.49-35.67)	37.41 (32.49-42.83)	0.157

CONCLUSION. Although microdialysis is a useful tool for the prognosis in patients with traumatic brain damage, its value seems limited when used in spontaneous intracerebral hematomas.

0297

INTERACTION BETWEEN MEROPENEM AND VALPROIC ACID IN NEUROCRITICAL PATIENTS

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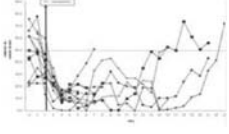
INTRODUCTION. Recent literature suggests a marked decrease in plasma concentrations of valproic acid (VPA) associated with concomitant administration of carbapenems. This interaction may increase the risk of epileptic seizures in neurocritical care patients.

METHODS. we retrospectively analyzed the interaction between meropenem and VPA in patients admitted in our NCCU between 2000-2005. During this period we had twelve patients that received concomitante treatment with VPA and meropenem. Seven female and five male with mean age of 59 years admitted with neurocritical diseases needed antiepileptic treatment either because of previous history of epilepsy or recent seizures. During their stay in the NCCU developed Gram negative nosocomial infections with indication for treatment with meropenem.

RESULTS. In all cases serum VPA levels fell imediately after meropenem therapy was started, in spite of increasing VPA daily intake until maximum dose. Patients were monitored with EEG and none of them developed acute seizures during this period. Meropenem seems to inhibit the hydrolytic enzyme involved in the hydrolysis of VPA-glucoronide to VPA, resulting in a decrease in plasma concentration of the active drug.



CONCLUSION. In concluison it is advisable that high risk patients for developing seizures should be closely monitored with VPA serum levels determination and EEG evaluation.

REFERENCE(S). Nakajima Y, Mechanism of the drug interaction between valproic acid and carbapenem antibiotics in monkeys and rats. Drug Metabolism and Disposition 2004;32(12):1383-91.
Nacarkucuk E, Meropenem decreses serum level of valproic acid. PediatricNeurology 2004; 31(3):232-4.

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0298

IMPACT OF RESPIRATORY RATE ON PULSE PRESSURE VARIATIONS

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INTRODUCTION. Pulse pressure variation has been proposed as a means of assessing fluid responsiveness in critically ill patients. However, this index may be sensitive to ventilatory settings. We hypothesized that pulse pressure variation may decrease at high respiratory rates.

METHODS. We investigated six patients ventilated in volume control mode with a tidal volume higher than 8 ml/kg at a respiratory rate (RR) lower than 15/min and with a pulse pressure variation higher than 10%. Cardiac index was measured in all patients, either with a pulmonary artery catheter (n=5) or with a PiCCO system (n=1). Cardiac index, mean arterial pressure (MAP), pulse pressure variation and the ratio between heart rate and RR (HR/RR) were measured at baseline (RR of 14/min), after increasing RR to 30/min and then to 40/min, and again at 14/min after volume expansion with 1000 ml of crystalloids. The inspiratory to expiratory ratio was kept constant during the entire procedure. Data are presented as median [percentiles 25-75]. We applied a Friedman test followed by a Wilcoxon rank test with Bonferroni adjustment for multiple comparisons.

RESULTS. Plateau pressure, total positive end-expiratory pressure (PEEP) level and transpulmonary pressure remained constant throughout the experiment.
The evolution of the principal variables is shown in the table.

TABLE 1.

	RR 14	RR 30	RR 40	RR 14 + fluids
Mean arterial press mmHg	66 [61-73]	68 [58-74]	67 [60-72]	79 [73-83]+
Cardiac index L/min.M²	2.1 [1.8-2.7]	2.1 [1.7-2.7]	2.3 [1.9-2.8]	2.6 [2.5-3.0]+
Pulse press var %	25 [15-31]	12 [4-15]+	2 [0-5]+	8 [5-14]+
HR / RR	7.6 [5.1-8.4]	3.9 [2.8-4.2] +	3.0 [2.9-3.1] +	7.3 [5.5-8.3]

+ p<0.05 vs baseline

CONCLUSION. The use of pulse pressure variation to evaluate fluid responsiveness can be influenced significantly by the respiratory rate; its usefulness can be masked when the HR/RRratio falls below 3.5.

0299

EFFECTS OF PEEP (POSITIVE END EXPIRATORY PRESSURE) ON PORTAL FLOW

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INTRODUCTION. Positive End Expiratory Pressure (PEEP) increases intrathoracic pressure at the end of the expiratory cycle and reduces the venous return to the heart. Venous portal flow drains into the inferior vena cava, therefore it can be influenced by the same condition. In this study we evaluate the effect of PEEP on venous portal flow.

METHODS. We studied venous portal flow in eight mechanical ventilated patients (5 males – 3 females; age 65 +/- 16.6 yrs) admitted to the Intensive Care Unit (ICU) for medical diseases: 3 Post-Anoxic Comas, 2 Chronic Obstructive Pulmonary Diseases, 2 Heart Failure and 1 Sepsis. During the examination, patients were haemodinamically stable, sedated and ventilated in Pressure Support Mode. Echo-Doppler (Hitachi H 21) with a 3.5-5 MHz convex probe was used to determine the venous portal velocity. The examiner put the probe on the abdomen in order to display the portal vein. At the end of the expiration the flow velocity was measured at Zero End Expiratory Pressure (ZEEP) and subsequently at 10 cmH20 of PEEP. Measures were repeated almost twice for each value of PEEP by two different examiners and the mean value was given for the statistical analysis. Results are given as mean +/- SD. Data were evaluated by paired t test and a value of $p < 0.05$ was taken as statistically significant.

RESULTS. PEEP determines a reduction of portal vein velocity: ZEEP 25.0 +/- 5.9 cm/sec; PEEP 18.7 +/- 4.9 cm/sec ($p < 0.006$).

CONCLUSION. The results of this study demonstrate that a variation of PEEP affects portal. Ultrasonography is able to detect this effect and could be useful in a more complete evaluation of patient haemodinamical status.

REFERENCE(S). Effects of PEEP on liver arterial and venous blood flow N Brienza Am J Respir Crit Care Med 1995; 152: 504-10.
Regional control of venous return: liver blood flow N Brienza Am J Respir Crit Care Med 1995; 152:511-18.

0300

MEASURING AORTIC DIAMETER IMPROVES ACCURACY OF ESOPHAGEAL DOPPLER IN ASSESSING FLUID RESPONSIVENESS

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INTRODUCTION. Fluid responsiveness requires the accurate measure of cardiac output that can be approached by aortic blood flow (ABF) as measured by esophageal Doppler monitoring (EDM). EDM devices may either include an echo-determination of aortic diameter or estimate aortic diameter from nomograms and thus consider it as constant. However, it is unclear if measuring aortic diameter increases the accuracy of EDM to identify fluid responsiveness. Aortic diameter varies with arterial pressure such that its measure could be essential for assessing the changes in ABF during acute circulatory failure. We attempted to demonstrate that measuring aortic diameter improved the accuracy of EDM to assess fluid responsiveness.

METHODS. In 76 patients with acute circulatory failure in whom a fluid challenge (500 ml NaCl 0.9%) was given, we measured aortic velocity and area by EDM before and after fluid loading and evaluated the effects of fluid challenge on ABF, either measured after fluid infusion (measured ABFafter) or estimated assuming an unchanging aortic area (estimated ABFafter).

RESULTS. If measured ABFafter was used for assessing fluid response, it was increased above 15% as compared to ABF at baseline in 41 patients (responders). Conversely, estimated ABFafter increased above 15% from ABF at baseline in 27 patients only, i.e. the effects of the challenge were underestimated in 14 patients. In these 14 patients, the relative change in mean arterial pressure during volume expansion was of greater magnitude than in patients who were classified as non-responders by considering measured ABFafter.

CONCLUSION. Monitoring the changes in aortic diameter improves the accuracy of EDM in assessing the hemodynamic effects of a fluid challenge, especially if it induces a large increase in arterial pressure. Estimating rather than measuring the aortic diameter may lead to underestimation of fluid responsiveness.

0301

PASSIVE LEG RAISING AND FLUID RESPONSIVENESS DURING SPONTANEOUS BREATHING: AN ECHO-DOPPLER STUDY

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INTRODUCTION. In patients with spontaneous breathing, volume responsiveness is a crucial issue and can not be predicted by respiratory variation in arterial pressure or stroke volume. In such patients, the increase of arterial pulse pressure during passive leg raising (PLR) has been proposed as an indicator of volume responsiveness. However, this indicator suffers from poor specificity and sensitivity.
The aim of the study was to test the hypothesis that PLR-induced changes of stroke volume calculated by echocardiography could predict fluid responsiveness in spontaneously breathing patients.

METHODS. We included spontaneously breathing patients with acute circulatory failure for whom the attending physician decided to perform a fluid challenge. At baseline, during PLR, before and after fluid challenge (500 mL NaCl 9% in 15 minutes), the stroke volume was calculated as the product of aortic valve area by the velocity time integral of aortic blood flow (VTIAo). At baseline, we also obtained two static markers of preload: the left ventricular end-diastolic area (LVEDA) and the ratio of mitral E wave velocity to the early diastolic velocity of the mitral annulus (E/Ea), which was measured by tissue Doppler imaging.

RESULTS. Twenty patients (65 ± 16 years old) were included. The main origin of circulatory failure was septic in 15 cases and non septic in 5 cases. At baseline, mean arterial pressure was 64 ± 11 mmHg, indexed stroke volume (SVi) was 39 ± 13 ml/m^2, and heart rate was 98 ± 22 beats/min. The increase in SVi after fluid challenge correlated with the increase of SVi during PLR (r^2=0.49, p=0.0006) but not with baseline LVEDA (p=0.8) and E/Ea (p=0.9). In the 15 patients who increased their SVi by more than 10% after fluid challenge (responders), SVi increased by 21 ± 11% (p<0.0001) after PLR and by 25 ± 9% (p<0.0001) after fluid therapy. In non-responders (n=5), SVi did not change after PLR. For predicting fluid responsiveness, an increase in SVi after PLR above 8% had a sensitivity of 100% and specificity of 100%.

CONCLUSION. The PLR-induced change in stroke volume measured by transthoracic echocardiography appeared as a good indicator for predicting fluid responsiveness in patients with spontaneous breathing.

0302

PASSIVE LEG RAISING AND FLUID RESPONSIVENESS DURING SPONTANEOUS BREATHING: PULSE CONTOUR EVALUATION

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INTRODUCTION. The aim of this study in patients with spontaneous breathing or arrhythmias was to investigate whether the response of pulse contour cardiac cardiac output to passive leg raising (PLR) could distinguish responders to volume expansion from nonresponders.

METHODS. Fifty two patients with circulatory failure were included. Arterial pressure variation could not be used for predicting fluid responsiveness because of spontaneous breathing (n=44) and/or arrhythmias (n=10). The pulse contour cardiac index (CI) was monitored by a PiCCO device (Pulsion, Germany). At baseline, during PLR and after fluid infusion (500 mL saline in 15 minutes), CI and arterial pressure were measured. The global end-diastolic volume (GEDV), a static marker of preload, was also obtained at baseline.

RESULTS. The PLR-induced increase in CI correlated with the fluid-induced increase in CI (r=0.62, p<0.0001) but not with baseline GEDV (p=0.2). There was a significant correlation between the rate of increase of pulse pressure during PLR and that after fluid challenge (r=0.40, p=0.003). The increase of CI after fluid challenge above 15% defined responders. At baseline, cardiac index was 3.1±1.0 L/min/m^2 in responders and 3.0±0.9 L/min/m^2 in nonresponders (p=0.8), GEDV was 720±206 mL/m^2 in responders and 776±273 mL/m^2 in nonresponders (p=0.3). In responders (n=27), CI increased by 25±20% (p<0.001) during PLR and by 34±20% (p<0.001) after fluid challenge while the pulse pressure increased by 16±17% (p<0.001) during PLR and by 24±28% (p<0.001) after fluid challenge. In nonresponders (n=25), neither CI nor pulse pressure changed during PLR. An increase in CI during PLR > 12% predicted fluid responsiveness with sensitivity (Se) of 70% and specificity (Sp) of 92%. The predictive value of PLR-induced increase in pulse contour CI was significantly better (area under the ROC curve = 0.80±0.06) than that of the PLR-induced increase in pulse pressure (threshold: 11%, Se: 59% and Sp: 80%; area under the ROC curve = 0.68±0.07).

CONCLUSION. The short-term changes in pulse contour CI induced by PLR provide a good prediction of volume responsiveness in patients with spontaneous breathing and/or arrhythmias.

0303

CHANGES IN MICROCIRCULACION ARE EARLY INDICATORS OF HYPOVOLEMIA

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INTRODUCTION. Our hypothesis was that changes in microcirculation are earlier indicators of hypovolemia than commonly used variables.

METHODS. 8 anesthetized sheep were stepwise bled (5, 10 and 15 ml/kg) at 30' intervals. Ileal intramucosal-arterial PCO2 (ΔPCO2), mean arterial blood pressure (MAP), cardiac output (CO) and intestinal blood flow (Qgut) were measured. Sublingual and ileal mucosal microcirculation were evaluated by sidestream darkfield (SDF) imaging. Microvascular flow index (MFI) was determined (1).

RESULTS. The change in ΔPCO2 was correlated with mucosal MFI (r2 = 0.45, p < 0.0001).

TABLE 1.

	CO (l/min)	MAP (mm Hg)	BE (mmol/l)	Lactate (mmol/l)	ΔPCO2 (mm Hg)	sublingual MFI	Ileal mucosal MFI
Basal	2.5 ± 0.4	83 ± 6	1 ± 3	1.6 ± 0.3	2 ± 5	3.1 ± 0.1	2.9 ± 0.1
5 ml/kg	1.9 ± 0.6*	82 ± 10	1 ± 3	2.5 ± 0.6*	5 ± 4	2.7 ± 0.3*	2.3 ± 0.3*
10 ml/kg	1.6 ± 0.3*	71 ± 17	-1 ± 5	4.0 ± 1.5*	8 ± 4*	2.6 ± 0.2*	2.0 ± 0.4*
15 ml/kg	1.4 ± 0.3*	60 ± 17*	-4 ± 5*	5.8 ± 2.2*	17 ± 15*	2.3 ± 0.2*	1.7 ± 0.4*

**p < 0.05 vs. basal.*

CONCLUSION. Before changes in MAP, BE or ΔPCO2 could be detected, there were significant alterations in sublingual and intestinal microcirculation and in lactate levels. SDF imaging might contribute to early detection of perfusion deficits.

REFERENCE(S). 1. Boerma E C, Mathura K R, van der Voort P H, Spronk P E, Ince C. Quantifying bedside-derived imaging of microcirculatory abnormalities in septic patients: a prospective validation study. Crit Care 2005;9:R601-6.

0304

ASSESSMENT OF DIASTOLIC DYSFUNCTION UNDER VARIABLE LOADING CONDITIONS

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INTRODUCTION. Echocardiographic assessment of diastolic function respectively dysfunction remains difficult under variable loading conditions, changes of preload during intensive care are frequently documented, presence of diastolic dysfunction however contributes to congestive heart failure and has an impact on choice of drugs.

METHODS. 16 patients on hemodialysis (HD), 10 male, median age 54 years SD13, exhibiting one or more Doppler echocardiographic signs of diastolic dysfunction: isovolumic relaxation time (IVRT)<100ms, peak velocity E< 100cm/s, Deceleration time>240ms or<150ms, E/A ration<1.1. Patients were investigated immediately before/after hemodialysis as a model for rapid preload reduction without apparent influence on myocardial contractility by pulsed wave and continous wave transmitral velocity profile.

RESULTS. Hemodialysis with a median weight reduction of 2.5kg (range 0.5-3.2) in all patients, left ventricular ejection fraction 55% (28-62), left ventricular muscle mass 141(89-213) g/m2. Heart rate before HD 74/min SD13, after HD 77/min SD13, systolic blood pressure before HD 151mmHg SD23, after HD 138mmHg SD25, diastolic blood pressure before HD 80mmHg SD6, after HD 77mmHg SD9. Doppler echocardiographic parameters before/after hemodialysis: peak velocities of E and A wave, deceleration time and isovolumetric relaxation time were significantly altered by different loading conditions.
IVRT before HD 100ms SD15, after HD 120ms, p=0.0002. Peak velocity E wave 97cm/s before 78cm/s after HD, p=0.0006. Deceleration time before 178ms after HD 244ms, p=0.0001. Acceleration time before 58ms after HD 56ms, p=0.6, non significant.

CONCLUSION. Pathologic reduced acceleration time as a parameter of left ventricular diastolic dysfunction seems to be a Doppler echocardiographic parameter stable against short term changes in loading conditions.

REFERENCE(S). Ashraf A. et al, Acute diastolic dysfunction: a new entity recognized ba transesophageal echocardiography in thoracoabdominal aortic aneurysm surgery. Canadian Journal of anesthesia 2005. 52, A 14.
Choong CY et al, Preload dependence of Doppler derived indexes of left ventricular diastolic dysfunction. J Am Coll Cardiol 1987. 10, 800-808.

0305

NON INVASIVE EVALUATION OF WEDGE PRESSURE, IN CRITICAL CARE PATIENTS WITH MECHANICAL VENTILATION

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INTRODUCTION. For many years, pulmonary artery catheterization has been a method of choice for assessing preload at the bedside in critical care units. Despite many recent concerns about its use, and the lack of evidence for benefits in medical trials, it is estimated that nearly a million pulmonary artery catheters are used per annum in the USA.
Hemodynamic changes associated with mechanical ventilation have been proposed as predictors of preload in critical care patients. The Valsalva maneuver has been described in previous trials as a useful tool for assessing preload; it appears to be a safe procedure, but it has not been tested in seriously ill patients.

METHODS. We enrolled mechanically ventilated critical care patients who had pulmonary artery catheters and arterial lines for various clinical conditions, hospitalized in Colombian critical care units between August 2004 and June 2005. Local staff-trained personnel measured pulmonary artery occlusion pressure (PAOP) through the pulmonary artery catheter, and we compared the results with the PAOP estimated by the Valsalva maneuver. For statistical analysis, we used SPSS Version 13.

RESULTS. We included 120 patients in the trial, comprising 3 categories: (1) 72 patients with shock, (2) 21 surgical patients, (3) 27 patients with miscellaneous conditions, described as 'others'. PAOP was measured directly through the pulmonary artery catheter and estimated by the Valsalva maneuver. There was a statistically significant correlation between the two measurements for the surgical patients (r2 =0.518, p<0.05) and the 'others' (r2=0.621, p<0.001). We found no statistically significant correlation for the shock group or for the overall patient population.

CONCLUSION. Pulmonary Artery Oclussion Pressure (PAOP) estimated by the Valsalva maneuver is a safe procedure for use in mechanically ventilated critical care patients. In surgical patients and patients who are not in shock, there is a good correlation between the PAOP measurements taken from a pulmonary artery catheter and estimated by the Valsalva maneuver.

REFERENCE(S). 1. Weilenman D, Rickli Hans: Non Invasive Evaluation of Pulmonary Capilary Wedge Pressure by Bp response to the Valsalva Maneuver. Chest 2002, 122:140-145.
2. Uehara H, Takenaka K: A New Method of predicting pulmonary capillary wedge pressure: The Arterial Pressure Ratio. Anaesthesia 2000, 55:113-117.

0306

RESPIRATORY VARIATIONS IN THE DIAMETER OF THE INFERIOR VENA CAVA ARE SIGNIFICANTLY REDUCED BY PEEP

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INTRODUCTION. It has been proposed that the respiratory variations in the diameter of the inferior vena cava (IVC) indicate fluid responsiveness (1). We hypothesized that application of positive end-expiratory pressure (PEEP) by hampering venous return and increasing the volume in the capacitance vessels would decrease the variations even if fluid responsiveness exists.

METHODS. 8, 20-22 kg, anesthetized, muscle-relaxed and mechanically ventilated pigs were subjected to 0.10, and 20 cmH2O of PEEP at 10% (of estimated blood volume) hypovolemia, normovolemia, and 10% hypervolemia. Hypovolemia was achieved by venesection and hypervolemia by infusion of a starch-solution. Subcostal echocardiography was performed and a cross section image of the IVC, covering one fully respiratory cycle, was recorded and stored in digital cine-loop format. The area together with the anterior-posterior (APD) and left-right (LRD) diameter during end- expiration and inspiration were measured. Maximum and minimum DIVC values over a single respiratory cycle were collected and the DIVC variation (DDIVC) calculated as the difference between the maximum and the minimum DIVC value, divided by the minimum value and expressed as a percentage (1). Statistics: Kruskal Wallis and Wilcoxons tests, p<0.025 was considered significant. Median and 25.75% are shown.

RESULTS. All measures, i.e., variations in APD, RLD and areas followed the same pattern. The APD values are shown. At hypovolemia and normovolemia, DDICV% decreased significantly by application of 10 and 20 cmH2O PEEP (from 44 (15.56)% to 7 (2.10)% and 4(2.10)% at hypovolemia, and from 9 (6.25)% to 5 (4.15)% and 2 (0.5)% at normovolemia) while at hypervolemia was no significant changes occurred (from 12 (5.13)% to 12 (10.15)% and 6 (4.9)%).

CONCLUSION. The respiratory variations in the diameter of the inferior vena cava were significantly reduced by application of PEEP suggesting that this method might not be useful for assessment of fluid responsiveness during mechanical ventilation with moderate or high PEEP.

REFERENCE(S). 1. Barbier C et al. Respiratory changes in inferior vena cava diameter are helpful in predicting fluid responsiveness in ventilated septic patients Intensive Care Med 2004;30:1740–1746.

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0307

EVALUATION OF PULMONARY ARTERY OCCLUSION PRESSURE USING ECHOCARDIOGRAPHY IN VENTILATED PATIENTS

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INTRODUCTION. The hemodynamic criterion of ARDS relies on the measurement of a pulmonary artery occlusion pressure (PAOP) less than or equal to 18 mmHg, which is usually obtained by pulmonary artery catheterization (PAC). We evaluated the ability of transesophageal echocardiography (TEE) to predict PAOP in ventilated patients.

METHODS. 82 patients were studied (mean age: 63±14 years; SAPS 2: 46±12). All patients were in sinus rhythm and underwent both a TEE and CAP. Invasive PAOP measured with CAP was used as reference. In each patient, the following conventional Doppler parameters were measured (mean of 3 end-expiratory measurements): mitral Doppler E/A ratio, pulmonary vein Doppler S/D ratio and systolic fraction (SF = VTI S/VTI S+D). In the last 26 patients, new Doppler parameters were also measured: early diastolic blood flow propagation velocity with color M-mode (Vp), and early tissue Doppler imaging (TDI) velocities of the lateral aspect of the mitral ring (Ea), with E/Vp and E/Ea ratios. Inter- and intra-observer variability in measured parameters was 1 to 13% and 2 to 7%, respectively. ROC curves were determined for each Doppler parameter to predict a PAOP less than or equal to 18 mmHg, and areas under curve (AUC) were compared.

RESULTS. All Doppler parameters were significantly correlated with invasive PAOP. Although AUC were similar between Doppler indices to predict PAOP, new Doppler parameters yielded highest values (table).

TABLE 1.
Prediction of PAOP less or equal 18 mmHg

	E/A < 1.4	S/D > 0.65	SF > 44%	E/Vp < 2.6	E/E' < 9.5
AUC	0.86±0.07	0.85±0.05	0.88±0.04	0.94±0.09	0.96±0.08
Sensitivity	85%	85%	85%	100%	100%
Specificity	89%	94%	88%	94%	86%

CONCLUSION. TEE allows to accurately predict the level of PAOP (< or > 18 mmHg) in ventilated patients. New Doppler indices could increase TEE diagnostic accuracy. These indices promise to yield the hemodynamic criterion of ARDS non invasively, while assessing patient hemodynamics using TEE.

0308

EFFECTS OF LUNG RECRUITMENT MANEUVERS ON SPLANCHNIC PERFUSION IN PIGS

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INTRODUCTION. Lung recruitment maneuvers are advocated in the management of impaired lung function due to atelectasis formation in order to improve gas exchange. This procedure may depress splanchnic circulation.

METHODS. Ten anesthetized and paralyzed pigs were instrumented with pulmonary artery catheter, central venous and arterial line. Ultrasonic flow probes and sensors for laser Doppler flowmetry were used to assess splanchnic blood flow and microcirculation. During the experiment normovolemia was maintained with Lactated Ringer's Solution and hetastarch. The animals were ventilated in volume controlled mode and a PEEP of 5 cm H2O. FIO2 was adjusted to keep arterial oxygen levels at 100-150 mmHg. Tidal volume was set at 10 mL/kg and minute ventilation was adjusted to maintain a PaCO2 between 34 and 41 mmHg. After a stabilization period of six hours a recruitment maneuver was performed with sustained inflation to 30 cm H2O for 10 seconds. Baseline ventilatory settings were resumed thereafter. Hemodynamic data were analyzed before and up to 15 minutes after the recruitment maneuver.

RESULTS. All regional blood flows decreased acutely and significantly ($p<0.05$, Friedman test) during the recruitment maneuver. Values are expressed as changes relative to baseline and shown as median (interquartile range): Carotid artery flow 0.46 (0.26-0.54), celiac trunk flow 0.32 (0.24-0.48), hepatic artery flow 0.37 (0.27-0.51), portal vein flow 0.55 (0.48-0.67), renal artery flow 0.49 (0.44-0.52), splenic artery flow 0.34 (0.30-0.54) and superior mesenteric artery (SMA) flow 0.64 (0.62-0.67). Baseline values of the regional blood flows were re-established within 1 to 3 minutes. Cortical and medullary renal microcirculation decreased in parallel with the regional blood flow to 0.69 (0.55-0.81) and 0.64 (0.61-0.78) respectively. Despite decreased regional blood flow to the liver and decreased SMA flow, hepatic and jejunal microcirculation were not impaired.

CONCLUSION. A moderate recruitment maneuver in healthy pigs causes transient and significant reductions in splanchnic blood flows. The liver microcirculation appears resistant to acute changes in regional flows, whereas renal microcirculation is acutely depressed.

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0310

EPIDEMIOLOGY OF INFECTION AND SEPSIS IN THE SAPS 3 DATABASE.

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INTRODUCTION. The objective was to study frequency, prognostic factors and outcome of critically ill patients with infection and to evalaute sepsis criteria in this cohort of critically ill patients.

METHODS. Substudy of a prospective multicentre, multinational cohort study. A total of 16,784 patients consecutively admitted to 303 intensive care units (ICUs) from 14 October to 15 December 2002 (SAPS 3 database) were studied. Details about the cohort and methods have been reported elsewhere [1,2].

RESULTS. Out of the whole cohort, 7,566 patients (45%) presented with SIRS. 3,505 patients (21%) presented with an infection already at ICU admission. Generally, infected patients were older (65 [50-75] vs. 63 [49-74] years, $p < 0.001$), exhibited more often female gender (42 vs 39%, $p<0.001$) and were significantly more often admitted unplanned (86 vs. 59%, $p<0.0001$). With respect to the surgical status, infected patients were more often admitted after acute surgery. Severity of illness as measured by the SAPS 3 Admission Score was significantly higher in infected patients (62 [52-72] vs. 44 [36-56]), as were hospital mortality rates (41.8 vs 18.7%). ICU length of stay was significantly increased in infected patients (5 [2-12] vs. 2 [1-5] days). Out of the infected patients, 704 presented with infection, 190 (5%) with sepsis, 1768 (50%) with severe sepsis and 843 (24%) with septic shock. Hospital mortality rates increased from 32% (infection) to 58% (septic shock).

CONCLUSION. Infection was present in 21% of admitted patients and was associated with increased ICU length of stay and increased ICU and hospital mortality rates.

REFERENCE(S). 1 Metnitz Ph G H, Moreno R P et al. Intensive Care Med 2005; 31:1336-1344. 2 Moreno R P, Metnitz Ph G H et al. Intensive Care Med 2005; 31:1345-1355.

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0309

SEX GENDER INFLUENCES THE OUTCOME OF SEVERE SEPSIS

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INTRODUCTION. Compelling experimental evidences have suggested that females may have a more active immune system offering them a better protection against severe infection. This would be related to sex hormones differences. However clinical studies are far more controversial. We hypotheses that these discrepancies may be related on the population studied: severe sepsis, shock septic, and hormonal status (pre or postmenopausal).

METHODS. We studied 1692 severe sepsis patients from the 4860 patients included in the Outcomerea database® over an 8-year period. We first determined variables independently related to hospital mortality using a logistic regression method. Based on these variables, we developed a propensity score for mortality and used it to carefully match women with men. We evaluated the sex gender's influence on the outcome on severe sepsis, septic shock through the use of a conditional logistic regression. Subgroups analyses were performed on the age before <50 year (pre-menopausal) or after 50 year (post-menopausal).

RESULTS. We matched 1000 men with 608 women with severe sepsis; the hospital mortality was lower in women (OR: 0.75 [0.657-0.97], after adjusting for confounding variables, p=0.02). This effect was even more significant in older women (>50 year old) vs. men (OR: 0.69 [0.52-0.93, p=0.014]). Interestingly, we did not observe any difference in premenopausal (<50 year old) versus men (OR: 1.01 [0.52-1.97, p=0.98]). No sex gender differences were unmasked when considering only patients with septic shock (n= 310 vs. n=491, respectively): there was no difference in outcome in this subgroup of patients (OR: 0.92 [0.65-1.3]).

CONCLUSION. Women with severe sepsis have a lower risk of hospital mortality than men. This better chance of survival was more pronounced after the age of 50 (postmenopausal). Furthermore, there was also no difference in hospital mortality in the subgroup of patients with septic shock, irrespective of the hormonal status.

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0311

DIAGNOSIS OF LATE COMPLICATIONS AFTER TRACHEOSTOMY WITH VIRTUAL LARYNGO-TRACHEOSCOPY

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INTRODUCTION. Tracheostomy (surgical and percutaneous) is a well-established procedure for prolonged mechanical ventilation in the critically ill adult patient. Fiberoptic laryngotracheoscopy (FLT) is used in the evaluation of the trachea following decannulation but it involves discomfort. Today it is possible to perform virtual endoscopy by multislice CT within seconds even in debilitated patients. Our aim was to confirm the value of virtual laryngo-tracheoscopy (VLT) in the diagnosis of cervical tracheal granulations and stenosis of various grades in clinic and in an animal model experiment.

METHODS. We examined 28 patients (19 males and 9 females) who were recruited from ICU after tracheostomy and decannulation. Examinations were performed between a few days and 12 months after decannulation on a multidetector CT scanner. Navigation through the laryngo-tracheal lumen as well as reformatted coronal and sagittal images were performed on GE AW 4 workstation. The animal studies were done on 10 adult dead pigs in three series. In the first series, normal parameters of the larynx and cervical trachea were examined with adult bronchoscope Olympus (FLT) and after that by VLT. In the next two series, cervical tracheal granulations and stenosis were simulated and examined by both methods. The parameters of the larynx and cervical trachea were accurately measured

RESULTS. The pathological changes in the clinical study found with the help of VLT were: mural granulations, polypoid mass in the tracheal wall, tracheal wall flap and flap with a persistent tract. When the FLT was performed it showed the same findings. The animal study confirmed our supposition that endoscopic pictures and virtual images provided similar macroscopic appearance. In most lesions, the measurements and localization of the abnormalities with VLT were more precise and easy to perform compared with FLT.

CONCLUSION. Comprehensive evaluation of the trachea can be achieved by combining these two techniques. We suggest that in the evaluation of critically ill patients following decannulation VLT examination should be done first. In cases where endoscopic biopsy or treatment is required, FLT should be then performed. Prospective studies will help to find out patients with complicated healing after tracheotomy and give opportunity to treat them properly.

0312

THE INCREASING BURDEN OF ALCOHOLIC LIVER DISEASE ON UNITED KINGDOM CRITICAL CARE UNITS

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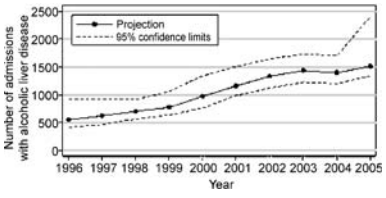
INTRODUCTION. Alcohol consumption in the United Kingdom (UK) has steadily increased since the 1950s, with annual per capita consumption of 100% alcohol doubling from 4 litres to over 8 litres in this time [1]. We investigated the effect of increased alcohol consumption on the number of admissions to intensive care units (ICUs) in the UK each year.

METHODS. Using data from 385,429 admissions to 166 adult ICUs in England and Wales from 1996 to 2005, we investigated how the number of admissions with alcoholic liver disease, their case mix, outcome and length of stay has changed during this time. Admissions were identified from the Case Mix Programme Database if they had 'alcoholic cirrhosis' or 'alcoholic hepatitis' specified as a reason for admission or other relevant condition. These figures were extrapolated to estimate the total number of admissions with alcoholic liver disease each year to all 229 adult ICUs in England and Wales.

RESULTS. We identified 4,219 admissions with alcoholic liver disease. The percentage of admissions with alcoholic liver disease increased from 0.7% in 1996 to 1.4% in 2005, but case mix, outcome and length of stay remained similar. The percentage of ICU bed-days occupied by these admissions has also increased. The projected total number of admissions to all ICUs in England and Wales increased from 500 in 1996 to 1500 in 2005 (figure), and the projected total number of bed-days occupied increased from 3,000 to 10,000.



CONCLUSION. ICU admissions with alcoholic liver disease have trebled in a 10-year period.

REFERENCE(S). 1. The Academy of Medical Sciences. Calling time: the nation's drinking as a major health issue. March 2004.

0313

IMPACT OF AN INTERVENTION ON THE DELAY OF TREATMENT IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION

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INTRODUCTION. Despite technological advances in coronary care, mortality related to Acute Coronary Syndrome (ACS) is entirely proportional to the delay to contact health system and receive an appropriate treatment. Our aim was to evaluate the impact of an educational campaign about ACS on the delay of demanding assistance and providing adequate care.

METHODS. Quasi-experimental design with retrospective (pre-test) and prospective (post-test) data and non-equivalent control group. The target population included adults older than 30 from the catchment area of our hospital. The educational campaign was designed to provide comprehensive information about ACS and improve coordination among all the health system links involved in coronary care. Data from 242 patients pre-intervention and 241 from the intervention with diagnosis of acute myocardial infarction (AMI) admitted to ICU were collected. As a control group, we used data from a different catchment area similar in population during both periods including, respectively, 182 and 180 patients with AMI admitted to another ICU.

RESULTS. Comparing before and throughout the intervention, the intervals Symptoms-First contact and Symptoms-Fibrinolysis were shortened, but only the interval Hospital-Fibrinolysis was significantly reduced (52'(39.85) vs 39'(29.70); p= 0.002) (expressed as minutes (percentile 25.75). In the control group, none of these intervals showed a significant reduction in time during the study period. The access to the hospital was mainly by private transport (62.4%) in pre-intervention group, whereas the use of public health transport was increased after the campaign (from 37.6% to 57.4%; p<0.001). In patients who arrived at the hospital using private transport, a significant reduction in the delay between the onset of symptoms and fibrinolytic therapy (180' vs 124'; p=0.009) before and after the intervention was observed.

CONCLUSION. 1. The educational campaign and a better coordination among health system links reduced the delay in receiving fibrinolytic therapy in patients with AMI. The interval from arrival at the hospital to fibrinolysis was significantly shortened, compared to a control group.2. Despite the increase in the use of public health transport to arrive at the hospital, patients using private transport received fibrinolytic therapy earlier during the intervention period.

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0314

DRUG RELATED HEAT STROKE AT ADMISSION TO INTENSIVE CARE UNIT DURING HEAT WAVE IN AUGUST 2003

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INTRODUCTION. More than 10000 of deaths were attributed to heat wave during August 2003 in France. Classic heat stroke was uncommon in this country. Underidentification of drug related heat stroke could worsen organ failures and outcomes in intensive care unit (ICU). Few studies have assessed drug related morbidity in heat waves (1,2). The aim of this study was to assess frequency and characteristics of drug related heat stroke at admission to ICU during the august 2003 heat wave and type of drugs involved in heat stroke.

METHODS. Patients admitted during the heat wave were included in a prospective study to a university hospital medical ICU. All drugs taken the month before admission to ICU were collected and a standardized questionnaire filled. For each patient, an independent expert panel determined relashionship between drugs and heat stroke, after follow-up and by using imputation method. Follow-up focused on morbidity, mortality, workload for personnel, and length of stay. Heat stroke patients were defined by an elevated core body temperature above 40°C with central nervous system dysfunction, in the absence of other etiologies explaining hyperthermia (1,2).

RESULTS. Between the 2 and 14th of August 2003, 43 were admitted in ICU. Eight patients (18.6%) were admitted for heat stroke. On admission, 6 of 8 heat stroke patients had 3 drugs or more known to interact with thermoregulation process. Lithium, neuroleptics, antiparkinsonian, and antihypertensive drugs were involved. In 4 cases, patients have association of neuroleptics therefore, a malignant syndrom was first suspected in the first hours in 2 cases. Despite intensive cooling, and artificial support (hemodialysis in 3, blood transfusions, vasopressive drugs and mechanical ventilation in 4), 3 of them died. Workload for personnel, length of stay were the same between patients with or without drug related heat stroke.

CONCLUSION. Heat stroke were frequently worsened by psychiatric, antiparkinsonian and antihypertensive drugs (1). Drugs, delayed diagnosis and subsequent treatment may increase heat stroke related mortality.

REFERENCE(S). (1) Kilbourne E M, et al. Risk factors for heatstroke. JAMA 1982;247:3332-3336. (2) Dematte J E, et al. Near-Fatal heat stroke during the 1995 heat wave in Chicago. Ann Intern Med 1998;129:173-81.

0315

THE LINK BETWEEN AGE AND RECENT INCREASES IN ADMISSION RATES TO ICU/HDU FOR RSV BRONCHIOLITIS

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INTRODUCTION. Many clinicians in Ireland have felt that there has been an increase in the severity of bronchiolitis over the last decade. During an infant's first episode of RSV, 0.5%-2.5% require hospitalisation (Centers for Disease Control and Prevention). The aim of this study was to examine if there has been an actual rise in the number of cases of bronchiolitis and also if there has been a rise in the percentage of cases requiring admission to ICU/HDU. The cases were also reviewed to determine if there was any correlation between admission to ICU/HDU and a shift in age profile of the infants.

METHODS. All cases of bronchiolitis admitted to Temple St Hospital were reviewed between September 1996 and February 2006. Data was obtained from the infection control records of the Microbiology Department. Data regarding admission to ICU/HDU was available from September 1998. All cases were RSV positive by nasopharyngeal aspirate and aged less then 365 days on the day of virus isolation. Each bronchiolitis season was taken from September to February.

RESULTS. In total there were 667 cases over the ten years. There has been a steady increase in the percentage of children requiring admission to ICU/HDU from 5% in 1998-9 to 17% in 2005-6. The average age has not changed significantly, with a range of 104-137 days. The percentage of children in the group aged less then 49 days has varied greatly from 0% to 31% of the whole group. The increase in the admission rates of all infants is strongly correlated to a rise in the admission rate amongst infants aged less then 49 days (r=0.776). The total number of children in the group less then 49 days also strongly correlates with the admission rate (r=0.593) while there is no significant correlation of children aged 49-90 days (r=-0.004) and over 90 days (r=-0.004) with admission rates.

CONCLUSION. The recent rise in the admission rates to ICU/HDU is strongly correlated to the rise in percentage of the infants aged less then 49 days in the group as a whole, and also the rise in the percentage of children less then 49 days requiring admission to ICU/HDU. Maternal protective antibodies are postulated to play a significant role in the protection of these infants aged less then 49 days. An antigenic shift in the RSV may be occurring resulting in fewer infants receiving transplacental immunity to the virus. To further investigate this, a prospective national audit is being carried out this year to determine this, and other possible causative factors.

0316

OUTCOMES OF CRITICALLY ILL PATIENTS WITH LUNG CANCER.

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INTRODUCTION. Recent advances in oncology and critical care have resulted in improved survival in critically ill cancer patients. An appraisal of the prognosis of critically ill patients with lung cancer is timely. The aim of this study was to evaluate the outcomes and prognostic factors of critically ill cancer patients with lung cancer.

METHODS. From 2000 to 2005, patients with either small-cell (SCLC) or non-small-cell lung cancer (NSCLC) admitted at two intensive care units (ICU) in Brazil and France were included. Patients with postoperative care, ICU stay <24h and readmissions were excluded. Demographics, clinical, cancer related and outcome variables were collected. Hospital mortality was the outcome variable of interest. Variables selected in the univariate analysis (p<0.25) and those considered clinically relevant were entered in a multivariable logistic regression analysis [results were expressed as odds-ratios (OR), 95% confidence interval (CI)].

RESULTS. A total of 132 patients were studied (INCA=87, St Louis Hospital=45). Their mean age was 61±10 years and 73% were males. Twenty-five (19%) had SCLC and 107 (81%), NSCLC. The SAPS II score was 48±21 points. The main reasons for ICU admission were severe sepsis (45%) and acute respiratory failure (33%). During ICU stay, 96 (73%) patients received mechanical ventilation, 76 (58%) vasopressors and 11 (8%) dialysis; 15 (11%) patients were treated with chemotherapy and 6 (5%), radiation therapy. Thirty-eight (29%) patients had end-of-life decisions. ICU and hospital mortality were 43% and 60%, respectively. Multivariable analysis identified three independent determinants of hospital mortality: airway obstruction/infiltration by cancer [OR=2.87 (1.34-8.13), p<0.001], number of organ failures [OR=1.91(1.01-2.74), p=0.047] and performance status 3-4 before admission [OR=2.90 (0.94-8.95), p=0.065].

CONCLUSION. Improved survival in overall ICU cancer patients extends to patients with lung cancer, including those needing mechanical ventilation. Interestingly, the characteristics of the cancer are not associated with the outcome and should not be the grounds for the ICU decision making. Mortality is increased with the number of organ dysfunctions, in particular when respiratory failure is due to cancer progression.

0317

MORTALITY AFTER ACUTE RENAL FAILURE IS MORE DEPENDENT ON OTHER ORGAN FAILURE

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INTRODUCTION. Acute renal failure (ARF) is common in critically ill patients, and is often claimed to indicate a grave prognosis. The presence of concomitant severe organ dysfunction have been documented to influence mortality more than respiratory failure alone [1]. This investigation was performed in order to document survival after ARF with different degrees of concomitant organ failure.

METHODS. The study was conducted during a six year period (2000-2005) in a single ten bed academic ICU. Admitted adult patients had the sequential organ failure assessment (SOFA) [2] scored in six vital organ systems on a daily basis during their ICU stay. Severe dysfunction in any organ was defined as SOFA score of 3 or 4. Patients identified with severe ARF were retrieved from our ICU database, and grouped according to increasing number of concomitant severe organ dysfunction (pulmonary, circulatory, CNS, liver and coagulation) from none to six. Patients were followed for 90 days (including ICU and hospital survival).

RESULTS. There were 2660 admissions. Severe ARF was found in 544 (20.5%), and was present at admission in 319. During 223 admissions some form of renal replacement therapy (RRT) was given. The number, age, Max SOFA, SAPS II and mortality in each group are given in the table.

TABLE 1.
ARF in the different groups

	Number	Age years mean	Max SOFA mean	SAPS II mean	ICU mort %	Hosp mort %	90 d mort %
ARF alone	53	43.5	5.6	35.6	0	6.4	10.6
ARF + 1 OD	141	45.4	8.8	44.5	14.8	20.5	24.6
ARF + 2 OD	180	59.1	12.2	54.3	44.3	54.5	56.9
ARF + 3 OD	136	57.1	15.7	63.6	64.9	70.2	73.3
ARF +4/5 OD	34	52.5	19.6	65.5	73.5	79.4	82.4
All ARF	544	53.3	12.0	54.3	40.3	47.5	50.7
ARF with RRT	223	57.3	13.6	54.9	39.2	47.8	52.6
ARF without RRT	321	50.5	11.0	51.6	41.1	47.3	49.3

OD = organ dysfunction

CONCLUSION. Severe ARF is a frequent organ dysfunction in the ICU. The outcome of ARF is however more dependent on the presence and number of other severe OD. When occurring alone or with only one OD the mortality is low.

REFERENCE(S). 1. Flaatten H, Gjerde S, Guttormsen A B, Haugen O, Hoivik T, Onarheim H, Aardal S: Outcome after acute respiratory failure is more dependent on dysfunction in other vital organs than on the severity of the respiratory failure. Crit Care 2003, 7:R72.
2. Vincent J, Moreno R, Takala J, Willatts S, De Mendonca A, Bruinning H, Reinhart C, Suter P, Thijs L: The SOFA (Sepsis-related organ failure assessment) score to describe organ dysfunction/failure. Int Care Med 1996, 22:707-710.

0318

SURVIVAL OUTCOMES IN PATIENTS REQUIRING RENAL REPLACEMENT THERAPY FOR ACUTE RENAL FAILURE IN ICU

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INTRODUCTION. Patients in ICU with renal failure requiring treatment with renal replacement therapy (RRT) have poorer survival at hospital discharge and at 1 year, and this effect persists after adjustment for potential confounding factors (1). However, studies may not have adjusted for all important factors. Furthermore, little is known about the survival of these patients beyond one year. This study aims to evaluate the independent effect of renal failure in ICU patients requiring RRT on short and long-term survival.

METHODS. A retrospective cohort study of adult patients admitted to a 22-bed general ICU between 1987 and 2002. An ICU clinical database and two administrative databases (Hospital Morbidity Data System and Death datasets) were linked using probabilistic matching. Follow-up time from the index ICU admission was possible for at least 1 year for all patients, and up to 16-17 years (7% patients). Survival was evaluated at: (1) hospital discharge (logistic regression); (2) 1 year for patients who survived to hospital discharge (Cox regression); (3) subsequent survival, up to 17 years, for all patients alive at 1 year (Cox regression).

RESULTS. The study cohort of 21583 patients had a median follow-up of 6.6 years. Patients (n=915) having RRT in ICU (duration of therapy 1-40 days) had poorer unadjusted survival (54% vs 93% at hospital discharge, 46% vs 86% at 1 year and 33% vs 77% at 5 years). However, patients receiving RRT were sicker with higher severity of illness and comorbidity. Adjustment was made for covariates including age, gender, comorbidity, acute physiology score on admission, number of organ failures, elective surgery, ICU diagnosis, length of stay in ICU, mechanical ventilation, and year group of admission. Administration of RRT was not associated with worse survival to hospital discharge (OR=0.80, 95% CI 0.66,0.99); survival at 1 year, for patients who survived to hospital discharge, (HR=1.05, 95% CI 0.79,1.39); and on subsequent survival for patients who were alive at 1 year (HR=0.92, 95% CI 0.76,1.10).

CONCLUSION. Hospital and long-term survival is worse in patients who have RRT for renal failure in ICU. However this is a consequence of age, comorbidity, diagnosis and severity of illness, and not an independent effect of renal failure.

REFERENCE(S). Ahlstrom A et al. (2005) Survival and quality of life of patients requiring acute renal replacement therapy. Intensive Care Med. 31:1222-8.

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0319

CHARACTERISTICS OF MYOCARDIAL INFARCTION IN THE PRIMVAC REGISTER. A TEN YEARS PERSPECTIVE

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INTRODUCTION. The PRIMVAC registry (1) started in 1995 and has collected all acute myocardial infarctions episodes (AMI) admitted in the intensive coronary units (ICU) of the main hospitals in the Comunidad Valenciana (southeastern Spain).

METHODS. Demographic, clinical, procedural and outcome variables were registered in such patients since 1995 till 2004. Analysis of variance (parametric or not) was used for continous variables and trends Mantel chi square for nominal data. Bootstraping was performed for time variables. S-Plus statistical packet was used.

RESULTS. 19,719 cases with MONICA diagnosis of AMI were included in the decade 1995-2004. Mean age was 65 (SD 12) with 24.3% female. Coronary risk factors: 48.3% had hypertension, 32.2% hypercholesterolemia, 36.5% were current smokers, 29.4% diabetics, 17.3% had prior myocardial infarction and 4.3% had received prior revascularization (2.6% angioplasty and 1.7% coronary bypass). Regarding AMI characteristics: anterior location 42.1%, inferior 43.5%, not specified in 14.4% and Q wave in 72.6%. Complications: III/IV Killip group 14.3%, ventricular taquicardia 5.8%. ventricular fibrillation 5.1%, atrial fibrillation 9.2%, complete AV block 5%, angina 9.3%, reinfarction 2.6%, right ventricle impairment 6.8%, mechanical complications 2.6%. Overall mean mortality was 12.2% with a slight but continuous and significant decrease over the years (14.1% in 1995 vs 9.1% in 2004, p<0.01). Procedural variables: coronariography was performed in 13.6% of patients, 2.9% Swan-Ganz, 4.6%temporary pacemaker, intraaortic balloon pump 0.7%, mechanical ventilation 7.4%. Revascularization procedures: angioplasty was performed in 9.5%, cardiac surgery in 0.8% and thrombolysis in 44% of patients. Betablockers were used in 27.8% of patients, aspirin in 89.2% and ACE inhibitors in 42.3%. Time delay for thrombolysis was 180 min.

CONCLUSION. In this large registry of AMI admitted in ICU of the Comunidad Valenciana, mortality remains high but with a significant reduction in the last years. Nevertheless, thrombolysis and other revascularizations procedures as angioplasty are still offered to few patients.

REFERENCE(S). 1) Adolfo Cabadés; Ildefonso Echánove; Javier Cebrián et al.- Características, manejo y pronóstico del paciente con infarto agudo de miocardio en la Comunidad Valenciana en 1995: resultados del registro PRIMVAC (Proyecto de Registro de Infarto Agudo de Miocardio de Valencia, Alicante y Castellón). Rev Esp Cardiol 1999; 52: 123-133.

0320

REMIFENTANIL SHORTENS DURATION OF MECHANICAL VENTILATION AND ICU STAY

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INTRODUCTION. Reduction of duration of mechanical ventilation (MV) in ICU patients is related to decreased morbidity and mortality and may increase ICU bed capacity. We studied the effect of remifentanil-based analgo-sedation (RAS) on the duration of MV and length of ICU stay (LOS) compared to conventional analgesia and sedation (CAS).

METHODS. 16 ICU's participated in an open label, centre-randomized, centre-crossover study. Patients with an expected MV-time of 2-3 days requiring analgesia and sedation were included. Study medication was given for a maximum of 10 days; either: CAS (morphine or fentanyl combined with propofol, midazolam or lorazepam according to Dutch IC Society guidelines) or: RAS (remifentanil at a starting dose of 6-9 mcg/kg/h, titrated to 0-45 mcg/kg/h and combined with propofol when required). When required, patients received CAS after day 10. Duration of MV (start study medication - extubation) and LOS (start study medication - ICU discharge) were analysed using a Cox Proportional Hazards model, stratified by study centre. Subjects not reaching the endpoints, including death or still ventilated after day 10, were censored.

RESULTS. 205 ICU patients were included (109 CAS, 96 RAS). Age, SAPS, type of admission (post-surgical or medical) and diagnosis were well balanced. CAS contained morphine (58%), fentanyl (38%), propofol (46%), midazolam (81%) and/or lorazepam (7%). In RAS, the median weighted remifentanil dose was 8 mcg/kg/h and propofol was added in 65% of cases. Median duration of MV is 5.0 days (95% CI 3.4-6.6) for CAS and 3.9 days (95% CI 2.6-5.2) for RAS (crude Kaplan-Meier). Treatment effect on duration of MV was time dependent. For day 1-3 the extubation rate in RAS was 1.85 times higher than in CAS (p=0.019). Based on this ratio of 1.85, remifentanil increases the cumulative percentage of extubated patients as compared to CAS from 8% to 14% on day 1, from 23% to 38% on day 2 and from 34% to 54% on day 3. Between day 4 and 10, there was no significant difference (p=0.85). At day 10, 23 CAS-patients vs. 8 RAS patients were still mechanically ventilated (p=0.012). The ICU discharge rate during day 1-3 was 1.9 times higher in RAS than in CAS (p=0.044). The 85th percentile LOS values were 2.9 days for CAS and 1.8 days for RAS.

CONCLUSION. In patients with an expected duration of MV up to 3 days inclusive, remifentanil based analgo-sedation significantly decreases the duration of MV and length of ICU stay.

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0321

30-DAY MORTALITY OF ALCOHOL ABUSERS ADMITTED TO INTENSIVE CARE UNITS – A DANISH COHORT STUDY

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INTRODUCTION. A high prevalence of ICU admissions is related to chronic alcohol abuse. Limited data exist on the outcome of critically ill alcohol abusers requiring ICU admission. To clarify this issue we conducted a population-based cohort study to examine the 30-day mortality of critically ill alcohol abusers requiring ICU admission.

METHODS. Through Aarhus University Intensive Care Study Cohort we identified all first-time ICU admissions to three multidisciplinary ICU's within Aarhus University Hospital from 1999 through 2004. Alcohol abusers ("previously hospitalized with an alcohol-related disease" or "previously prescribed antabus (disulfiram)") and comorbidity were identified through linkage to hospital discharge registries and prescription databases. Complete follow-up for mortality were obtained through the Danish Civil Registration System. We constructed Kaplan-Meier survival curves, based on the date of ICU admission, for the main study variables (alcohol abuse, age, gender, comorbidity, renal replacement therapy (RRT), mechanical ventilation (MV)) and computed 30-day mortality. We used Cox's regression analysis to estimate 30-day mortality rate ratios (MRR) for alcohol abusers compared with non-abusers adjusted for potential covariates.

RESULTS. Of 9597 patients with a first-time ICU admission, 583 (6%) where alcohol abusers. Alcohol abusers were generally younger (82% vs. 47% were younger than 60 years of age) and were more likely to be male (68% vs. 41%) and had similar levels of comorbidity (42% vs. 44%). The prevalence of alcohol abusers treated with MV (34% vs. 43%) and RRT (5% vs.7%) was lower than of non-abusers. The 30-day mortality among alcohol abusers was 19% compared with 21% among non-abusers corresponding to an adjusted 30-day MRR of 1.34 (95% CI: 1.10-1.63). Among patients referred from departments of medicine we found a 30-day mortality of 18% among alcohol abusers compared with 28% among non-abusers corresponding to an adjusted 30-day MRR of 0.84 (95%CI: 0.64-1.11). Among patients referred from surgical departments we found a 30-day mortality of 22% among alcohol abusers compared with 17% among non-alcohol abusers corresponding to an adjusted 30-day MRR of 1.80 (95% CI: 1.37-2.37).

CONCLUSION. We found a 30% increase in 30-day mortality of critically ill alcohol abusers requiring ICU admission compared with non-abusers; however, the increased mortality was a superimposing of two findings. Among patients referred from departments of medicine the 30-day mortality of alcohol abusers was reduced by 15% whereas patients referred form surgical departments had a nearly two fold increased 30-day mortality.

0322

PROTHROMBIN & F V LEIDEN GENE POLYMORPHISM IN PATIENTS WITH DVT. PREVALENCE, DIAGNOSTIC AND THERAPEUTIC IMPLICATIONS.

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INTRODUCTION. Risk profiling in deep vein thrombosis (DVT) has been classically concerned with traditional factors of obesity, postoperative status, prolonged recumbency, long standing varicosity, etc with subsequent stagnation of blood & damage to vascular endothelium. Only recently, there has been increa sing concern with procoagulant factors as protein C, protein S, antithrombin III deficiencies as well as elevated F VIII, hyperhomocysteinemia, dysfibrinogenemia, etc.all of heredo familial nature.The present study is intended to assess the prevalence of two genetic disorders promoting coagulation namely, the mutant form of factor V (Leiden) and prothrombin gene in Egyptian patients with acute DVT.

METHODS. We studied 30 pts admitted with acute DVT (16M,14F, mean age 44±14y) & 30 control subjects (19M,11F, mean age (37±10y). Excluded from the study were pts known to have bleeding dia thesis, those with acute or chronic liver disease and those on oral or parenteral anticoagulation. Following clinical evaluation including twelve leads ECG and routine labora tory tests, all pts were subjected to venous duplex and gene identification. The latter comprised DNA extraction, PCR amplification, and gene mutation detection using the THROMBO TYPE reagent kit.

RESULTS. Compared to control subjects, pts with acute DVT had signif icantly higher prevalence of factor V Leiden Gene mutation (66.7% vs. 23.3%, p 0.003). Compared to non carriers of this mutant form, carriers exhibited significant more frequent familial incidence (55% vs. 15%, p 0.035), younger age of pre sentation (40y vs. 51y, p 0.048) & more frequent complications (55% vs10%, p 0.049). Prothrombin gene mutation was exhibited by 3 out of 30 pts with acute DVT (10%) & was associated with factor V Leiden in two of them None of control subjects ex hibited this mutant form of prothrombin gene 20210.

CONCLUSION. Acute DVT among young pts and particularly with recurrent DVT should urge the cardiologist to search for factors pro moting coagulation. Our data show abnormally high prevalence of mutant form of F V Leiden (associated with prothrombin gene mutation in a minority). Besides the diagnostic value, gene mutation detection has therapeutic and prognostic imp lications through the need to adjust the dose & the durati on of oral anticoagulation.

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Poster Sessions
Perioperative inflammation and infection
0323-0335

0323

VACUUM ASSISTED CLOSURE OF INFECTED ABDOMINAL WOUNDS AT SEPTIC SURGICAL ICU

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INTRODUCTION. Abdominal sepsis, tertiary peritonitis and re-operative abdominal surgeries lasting for many hours are inflicted with number of postoperative complications including operative wound complications. Necrotizing fascitis, dehiscence of laparotomy or small dehiscence of anastomosis with entero-cutaneous fistulas prolong the hospitalization of a patient at the ICU. Deep purulent complications in the operative wound demand expensive, painful and many weeks lasting dressing changes.

METHODS. We have been using Vacuum assisted closure (V.A.C.) system in the treatment of those complications since June 2004. It is a sandwich method where we insert semi-permeable folia or mesh non-permeable folia into open laparotomy. Polyurethane foam and adhesive non-permeable folia is placed on top of that and into which centre target with vacuum catheter is placed. In case of fascitis the foam is placed directly onto the wound and its edges are sealed up with non-permeable folia with a target. The wound is then continuously or intermittently evacuated and dressing is changed once every 4-5 days.

RESULTS. We used this system in case of 11 patients in the period between 06/2004 - 03/2006. The system must have been changed 4 times in average, then the subcutaneous layer and skin was sawn up or a stomy device was possible to apply in case of reduced wound around the entero-cutaneous fistula. The wound healed within 22 days in average.

CONCLUSION. VAC system is a promising possibility in the management of complicated dehiscences in place of laparotomy. Active vacuum prevents pus retention, effectively lowers pus secretion, decreases edematous inflammatory reaction and supports granulation production. Main advantages are seen in faster healing and lower number of painful dressing changes. This system is almost irreplaceable only possibility of treatment of large dehiscent wound and enterocutaneous fistula. The next advantage, especially for ICU, is closeness of this system and therefore lower risk of spreading the hospital related infection.

0324

REDUCTION OF MYOCARDIAL INJURY BY APROTININ DURING OFF-PUMP CORONARY SURGERY

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INTRODUCTION. Aprotinin (A) is a serine protease inhibitor that is being used widely in cardiac surgery in order to reduce blood loss. In a recent study, use of A was associated with a significant increase in the risk of myocardial infarction or heart failure probably because of intravascular thrombosis (1). The effect of A during OFF pump coronary surgery (OPCAB) is still not widely described. OPCAB is associated with postoperative hypercoagulability which may compromise the patency of bypass grafts (2). Then, the aim of this study was to evaluate the risk of myocardial infarction in patients undergoing OPCAB with or without A.

METHODS. 78 consecutive patients undergoing OPCAB with preoperative use of A (GrA) were retrospectively compared to 160 patients operated without A (GrT). Patients in group A received a bolus of 2 x 10(6) KIU during 30 minutes, followed by a continuous infusion of 0.5 x 10(6) KIU per hour until the end of surgery. Troponin I and CKMB levels were assessed at arrival in ICU (H0), 6 & 18 hours later (H6, H18). Statistical analysis was performed with t test, chi-2 test and anova.

RESULTS. The 2 groups were similar for age, weight, ejection fraction and EuroSCORE. Significant inter-group differences were found in troponin I levels (p=0.023, fig), in CKMB values and cumulative blood loss within 24h.

TABLE 1.

	Gr A	Gr T	p
Blood loss ml	499 (248)	853 (368)	<0.0001
CK MB H6 µg/j	14 (13)	22 (25)	0.07
CK MB H18 µg/j	18 (20)	22 (45)	0.44
Troponin I H0 µg/l	0.6 (1.1)	1.2 (1.8)	0.06
Troponin I H6 µg/l	1.5 (1.8)	3.7 (5.3)	0.006
Troponin I H18 µg/l	2.1 (2.7)	3.3 (5.7	0.14

CONCLUSION. During OPCAB, A reduces myocardial injury after OPCAB surgery as describe in experimental study (3).

REFERENCE(S). 1 Mangano D T. The risk associated with aprotinin in cardiac surgery. N Engl J Med. 2006 26; 354:353-65.
2 Kim K B, Off-pump coronary artery bypass may decrease the patency of saphenous vein grafts. Ann Thorac Surg. 2001;72:S1033-7.
3 Khan T A. Reduction of myocardial reperfusion injury by aprotinin after regional ischemia and cardioplegic arrest. J Thorac Cardiovasc Surg. 2004;128:602-8.

0325

OUTBREAK OF INVASINE ASPERGILLOSIS IN SICU PATIENTS PROBABLY ASSOCIATED WITH A CONTAMINATED AIR-HANDLING SYSTEM

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INTRODUCTION. Aspergillus species are infrequent but serious cause of nosocomial infection. An outbreak of Aspergillus infection at Onassis Cardiac Surgery Center was identified among patients who underwent cardiac surgery between 1/1/05 to 31/12/05. During this period, 5 patients were identified, all of whom had Aspergillus species cultured from normally sterile sites.

METHODS. We retrospectively reviewed records of patients who underwent cardiac surgery in our 16-bed ICU with microbiological or histopathological evidence of Aspergillus during SICU stay.

RESULTS. Surgical procedures included: ascending aorta replacement (n=1), valve replacement (n=3), CABG and AVR (n=1). Engineering records were reviewed and no hospital construction or renovation projects took place during this period. All cases clustered in two operation theaters during a 5-month period. The exclusive occurrence of Aspergillus infection among surgical patients led to a closer examination of air quality in this area. A Biotest Air Sampler RCS (D-6000) Hycon used to measure the number of Aspergillus colonies/m^3 (colonies/m^3 =colonies on agar strip/sampling time). Sampling from the two operating theaters (no3, 4) showed a high Aspergillus colonization far exceeding the allowed norms (no3: 125cfu/m^3 and no4: 113cfu/m^3). Our 4 operating rooms are supplied with filtered air from two independent ventilation systems. Theaters no3 and no4 where the Aspergillus was identified are supplied from the same unit. Despite that the examination system indicated that no filters needed replacement; they were all immediately replaced and the air tunnels meticulously cleaned. After that no additional invasive Aspergillus infections have been occurred up to the end of March 2006.

CONCLUSION. Nosocomial transmission of Aspergillus infection occurs most often during or after hospital or surroundind buildings construction or renovation and usually observed in immunocompromised patients. However, the development of postoperative invasive Aspergillus infection is unusual. The investigation of invasive Aspergillus infections among post-surgical patients identified contamination in an operating theater air-handling system. Although contamination of air-handling system is uncommon, this outbreak suggests that some modification in current air quality guidelines is necessary in ICU and operating theaters.

0326

EFFECTS OF STATIN ON INFLAMMATORY RESPONSE AFTER OFF-PUMP CORONARY SURGERY

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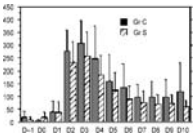
INTRODUCTION. Preoperative statin (S) therapy may reduce the risk of mortality after CABG with CPB (1. S induces biologic effects independent of lipid lowering which could explain this improvement, including anti-inflammatory effects (2). The aim of this study was then to test the hypothesis that pretreatment with S before cardiac surgery without bypass (OPCAB) reduces postoperative inflammatory reaction.

METHODS. Data were collected retrospectively for 277 patients undergoing non emergent OPCAB including 178 patients treated with S (GrS) and 99 non-S-pretreated (GrC. Primary outcomes was C-reactive protein levels preoperatively (D-1) and from day of surgery (D0) to day 10 (D10). Statistical analysis was performed with t or chi-2 test and anova.

RESULTS. Preoperative use of S significantly reduced mortality (table) and CRP levels (Fig, p<0.0001).

TABLE 1.

	GrS	GrC	p
Age	67 (11)	68 (9)	0.41
Ejection Fraction (%)	53 (16)	53 (18)	0.35
EuroSCORE	4.3 (2.7)	5.0 (3.2)	0.06
Length of surgery (min)	183 (53)	197 (51)	0.04
Length of stay (D)	8.9 (3.6)	10.1 (9.8)	0.18
Mortality	1.1	6.1	0.05



CONCLUSION. Pretreatment with S reduces postoperative CRP levels after OPCAB as found in patients operated with CPB (3).

REFERENCE(S). 1 Pan W. Statins are associated with a reduced incidence of perioperative mortality after coronary artery bypass graft surgery. Circulation. 2004; 14:II45-9.
2 Albert MA. Effect of statin therapy on C-reactive protein levels: the pravastatin inflammation/CRP evaluation (PRINCE): a randomized trial and cohort study. JAMA. 2001 4:64-70.
3 Chello M. Effects of atorvastatin on systemic inflammatory response after coronary bypass surgery. Crit Care Med. 2006;34:660-7.

0327

DOES BNP CORRELATE WITH THE DEGREE OF ORGANIC DYSFUNCTION IN THE POSTOPERATIVE PERIOD OF CARDIAC SURGERY?

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INTRODUCTION. BNP has been studied as a promising follow-up marker and risk predictor for cardiac surgery (CS) patients (pts); however, its behavior in the postoperative (PO) period of CS is still controversial. The objective this study is to correlate preoperative and PO BNP levels of pts undergoing elective CS with Multiple Organic Dysfunction Score (MODS) in the PO period.

METHODS. Prospective study with a cohort of 83 CS pts selected between August 2003 and September 2005. Their mean age was 67.0±8.55 years, 23 (27.3%) were females, and the mean Euroscore was 4.0±2.60. BNP was quantitatively measured by use of immunofluorescence (Biosite Triage BNP Test) in the preoperative period (BNPPre), and in the first (BNP1) and sixth (BNP6) PO hours. MODS of the first (MODSD1) and third (MODSD3) PO days was used, the cut-off point being ≥ 3. The statistical analysis comprised Spearman rank correlation, Kruskal-Wallis test and ROC curve.

RESULTS. The mean BNP levels were as follows: BNPPre = 181.0 $\pm$ 368.95 pg/mL (MED = 58.7); BNP1 = 156.0 $\pm$ 276.9 (MED = 67.2); and BNP6 = 280.3 $\pm$ 567.4 (MED = 146.0). The mean MODSD1 was 2.7 $\pm$ 1.8 (MED = 2) and the mean MODSD3 was 1.7 $\pm$ 2.0 (MED = 1). The Kruskal-Wallis test showed no significance of BNPPre, BNP1 and BNP6 to predict MODSD1 ≥ 3 (0.99; 0.73; 0.19) and MODSD3 ≥ 3 (0.30; 0.21; 0.55). By using the Spearman test, a correlation was observed between BNPPre and MODSD3 (rho = 0.256; p = 0.02). The area under the ROC curve of BNPPre to predict MODSD3 ≥ 3 was 0.57.

CONCLUSION. In the population studied, BNP was not a good predictor of organic dysfunction in the PO period of CS; a small correlation with MODSD3 was observed. Further studies with more critically ill patients are required.

0328

ASSESSMENT OF ENDOTHELIAL FUNCTION IN PATIENTS WITH SEVERE CORONARY ARTERY DISEASE

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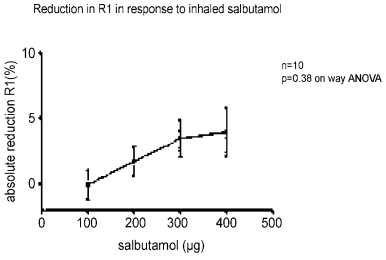
INTRODUCTION. The vascular endothelium exerts control over local thrombosis, inflammation and blood flow in addition to its barrier function. Traditionally endothelial function has been assessed using venous forearm plethysmography and flow mediated vasodilatation. These techniques are unsuitable for assessment of patients in the peri-operative period. Pulse wave analysis (PWA) is a novel technique that may have potential for endothelial function assessment in these patients. We have investigated the use of PWA and the response to salbutamol whose effects are partially mediated by the endothelium.

METHODS. Patients with triple vessel coronary artery disease were enrolled (n=10). Studies were undertaken following abstinence of caffeine and recent fatty meals with patients lying supine in a quiet temperature controlled room. Recordings were taken from the Pulse Trace apparatus that analyses the digital pulse waveform. The response to incremental doses of inhaled salbutamol was recorded. Blood pressure and heart rate were monitored throughout the study.

RESULTS. A small dose-dependant reduction in the reflection index (RI): 3.96 +/- 1.86%, (p = 0.38, one-way ANOVA) was observed only in response to relatively high doses of inhaled salbutamol 400mcg. Values were averaged between 5 and 15 minutes after inhalation.



CONCLUSION. The reduction in RI following inhaled salbutamol in patients with severe coronary artery disease is very small. This may indicate that this technique is unsuitable for assessment of endothelial function in this population.

Grant acknowledgement. Intensive Care Society

0329

CMV VIREMIA IN CRITICALLY ILL CARDIAC SURGERY PATIENTS

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INTRODUCTION. The manifestations of CMV infection in immunosuppressed patients rang from asymptomatic virus shedding to severe organ disease. Patients who are not treated with immunosuppressive drugs and who are HIV-negative are usually not considered immunocompromised, and are therefore not at high risk for CMV infection. However, some reactivations have been observed in other populations, for example, after trauma, as well as in patients with cirrhosis, renal failure and those receiving dialysis. The objective of this study was to determine the prevalence, associated findings, and consequences of CMV viremia on surgical intensive care unit (SICU) patients.

METHODS. Between a 12-month period we retrospectively reviewed records of patients who underwent cardiac surgery in our 16-bed SICU, and had positive CMV screening test by a molecular test assay. Patients with HIV infection and transplant recipients were excluded. Patients were tested for CMV based on clinical judgment of the attending physician.

RESULTS. From a total of 1450 patients (p), 6 p (0.4137%) were found positive for CMV by the method of PCR (mean age: 70±7.51years). 2 p underwent valve replacement, 3 p CABG and 1 p Bentall and CABG. CMV viremia was diagnosed within 25.83±9.62 days after ICU admission. All patients fulfilled the sepsis criteria, were on mechanical ventilation, experienced renal failure and 4 p needed dialysis. All were on enteral nutrition. All p had been transfused but blood transfusion is considered a contamination risk when blood products were not leukocyte depleted. In our practice, all blood products used were leukocyte depleted. But this process usually does not eliminate all leukocytes, and few leukocytes are required for a CMV viremia to be positive. 1p received a 14-days antiviral therapy.

CONCLUSION. CMV viremia is not an uncommon diagnosis in critically ill CSICU, regardless of their immune system status. The clinical significance of CMV is unknown and the differentiation between CMV detection and CMV disease represent a difficult diagnosis dilemma. CMV has known immunosuppressive effects, which may predispose chronic SICU patients to subsequent bacterial and fungal infection, and subsequent organ failure and death. Several factors suggest pathogenicity, but further study is needed to define causalty.

0330

EVOLUTION OF PROCALCITONIN, INTERLEUKIN, CRP AND WHITE BLOOD CELLS DURING INFECTION AFTER CARDIAC SURGERY

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INTRODUCTION. Cardiac surgery is predictable to induce an elevation of inflammatory markers even in the absence of a documented infection (Chris Maharaj et al, Curr Opin Anaesthesiol.2004). The aim of this study is to compare evolution of procalcitonin (PCT), interleukin 6 (IL6), IL8, CRP and white blood cells (WBC) in the case of cardiac surgery with cardiopulmonary bypass (CPB).

METHODS. Prospective observational study, including 100 adult patients who underwent a cardiac surgery with CPB. Patients with documented infection were included in group GI, the remaining patients in group GNI. PCT plasma level was determined before surgery, at hour 1 post operative (po), then daily until day 7 po. The threshold was considered as significant to indicate the occurrence of infection according to ROC curves.

RESULTS. Documented infection took place in 17 patients (bacteraemia, pneumonia, mediastinitis or parietal infection). Patients demographics as well as per operative clinical parameters were comparable in both groups. ROC curves analysis found that PCT plasma level in day 3 po (2ng/ml) had the highest predictive value of infection with a specificity of 90% and a sensibility of 77%. Air under the curve was 0.87. For CRP, WBC, IL6 and IL8 it was respectively 0.73, 0.75, 0.65 and 0.66. Compared with other markers of inflammation, PCT had the best positive and negative predictive values of post CPB infection.

CONCLUSION. In cardiac surgery, a procalcitonin plasma level > 2ng/ml after CPB, on the 3rd day post operative or just later would signal the occurrence of an eventual infection.

REFERENCE(S). Chris Maharaj et al, Curr Opin Anaesthesiol.2004.

0331

C-REACTIVE PROTEIN (CRP) DOES NOT PREDICT THE OUTCOME IN CARDIAC SURGERY

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INTRODUCTION. The objetive of this work was to analyzed the prognostic value of CRP during the cardiac surgery.

METHODS. CRP of 34 patients for cardiac surgery with extracorporeal circulation were analized before surgery and 0,5,12 and 18 hours after the end of the procedure. We compared the CRP levels of patients with complications (divided in global, cardiac, respiratory and other complications) versus those without these events. Results are expressed as mean (SD) and statistical differences like p<0.05.

RESULTS. There were no statistical differences in CRP levels in patients with complications and non complications divided in global, cardiac, respiratory and other complications (table1).

TABLE 1.
Complications vs. CRP

	CRP pre	CRP 0h.	CRP 5h.	CRP 12h.	CRP 18h.
With global complications	8.4(9.8)	5.4(7.6)	9.8(10.1)	68.8(23.6)	131.1(61.8)
No global complications	9.5(11.23)	7.3(7.4)	11.2(10.1)	68.6(23)	142.3(39.6)
With cardiac complications	5.95(7.7)	3.7(4.3)	8.2(6.6)	65(20)	135.8(55.7)
No cardiac complications	10.3(11.1)	7.4(8.6)	11.4(11.3)	70.8(24.5)	134.6(55.3)
With respir. complications	8.8(9.6)	5.3(4.6)	11.1(7.2)	63.4(23.5)	124.2(54.6)
No respir. complications	8.7(10.5)	6.3(8.2)	10.1(10.7)	70.4(23.1)	138.4(55.2)
With other complications	9.7(10.6)	6.7(9.2)	10.3(11.7)	65.8(27.4)	111.1(52.5)
No other complications	8.2(10.1)	5.7(6.4)	10.3(9)	70.5(20.3)	149.8(51.6)

**p<0.05*

CONCLUSION. CRP levels before and during postoperative period are not a good prognostic marker for predicting complications and outcomes after cardiac surgery.

REFERENCE(S). A. Aouifi, V Piriou. Effect of cardiopulmonary bypass on serum procalcitonin and C-reactive protein concentrations. Br J Anaesth 1999;83:602-07.
Mohamed Y. Rady. Perioperative determinants of morbidity and mortality in enderly patients undergoing cardiac surgery. Crit Care Med 2001;29:163-173.

0332

HRV, CORTISOL, MYOGLOBIN, CYTOKINE PRODUCTION AS BIOMARKERS OF PHARMACOLOGICAL PREPARATIONS.

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INTRODUCTION. The autonomic nervous system, endocrine, immune system form the stress-response of the organism.

METHODS. 1. Heart rate variability (HRV) is analyzed a computerized beat-to-beat heart rate. Thus are investigated SDNN, RMSSD. 2. Plasma concentration of cortisol is analyzed using radioimmuno-assay technique. 3. Cytokine production by means of study granulocyte-macrophage colony-stimulating factor (GM-CSF) of blood were defined as markers of a condition of immune system. 4. For an estimation of microcirculation were defined free myoglobin. All given parameters were studied initially, at the moment of application 30 and 60 minutes and 30 minutes after the termination of an intravenous infusion of a medicinal preparation. During increase adrenergic responses the patients received a single i/v of clonidine (0.018-0.027μ g/kg). During hypervagal responses the patients received dobutamine (4.6-6.9 μg/kg per min.).

RESULTS. Dobutamin decreased total variability of R-R intervals: SDNN from 89+/-18 to 27+/-3.5msec(**- p<0.01); rMSSD from 115+/-26 to 30+/-7.6msec(**-p<0.01). Dobutamin increased of level cortisol in plasma from 399+/-100.0 nmol/l to 466+/-109nmol/l. Dobutamin decreased of level myoglobin from 277+/-53 to 145+/-76 ng/ml(*-p<0.05) and decreased of GM-CSF from 100% (initially) to 74%(*-p<0.05). Clonidin increased total variability of R-R intervals: SDNN from 9.8+/-1.5 to 27+/-5.63msec(*- p<0.05); rMSSD from 3.9+/-0.5 to 25+/- 7.2msec (**-p<0.01). Clonidin decreased of level cortisol in plasma from 538+/-105 nmol/l to 444 +/-99nmol/l. Clonidin decreased of level myoglobin from 267+/-40 to 98+/-19 ng/ml(*-p<0.05) and decreased of GM-CSF from 100%(intially) to 57%(*-p<0.05).

CONCLUSION. Monitoring of neuroendocrine and immune parameters during of an intravenous infusion of a medical preparation has the potential to detect physiologic response to therapy in intensive care unit.

0333

ETOMIDATE AND ADRENAL INSUFFICIENCY AFTER CARDIAC SURGERY

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INTRODUCTION. A single bolus of etomidate could be a major risk factor for relative adrenocortical insufficiency in critically ill patients. After cardiac surgery, acute adrenal insufficiency can be easily unrecognized, and it can be hazardous. The objective of this study is to compare the risk of relative adrenal insufficiency if etomidate (versus other agents) is used for anesthesia induction in adults undergoing cardiac surgery.

METHODS. Consecutive adult patients who underwent elective cardiac surgery with cardiopulmonary bypass (CPB) in our hospital were prospectively included. Exclusion criteria: heart trasplant recipients, previous adrenal insufficiency, HIV or treatment with steroids in the 14 previous days or during surgery. Epidemiologic, surgical, hemodynamic and analytic variables (baseline cortisol concentration and after 60 minutes of an injection of 0.25 mg of ACTH) were analysed. The diagnosis of adrenal insufficiency was made if the baseline cortisol concentration was < 15 mcg/dl or an increase < 9 mcg/dl after ACTH administration. The results were analysed with the SPSS (Statistical Package for Social Sciences) software for Windows (version 11.0).

RESULTS. A total of 96 patients were included (men 68%), with a mean age of 63 ± 2 years old, and a mean Euroscore of 5 ± 1. Most of the patients underwent valvular (46%) or coronary (32%) surgery, with a mean CPB time of 120 ± 12 minutes. Mean intensive care stay of 2 days. The mortality rate was 2%. In 29 patients (31%) a distinct inductor of etomidate was used. We found adrenal insufficiency in 65 (70%) of all patients.

TABLE 1.

The result of the statistical analysis was:

	Etomidate (n: 65)	Others (n:29)	p
ISR Yes	56%	13%	<o.o1
ISR No	13%	17%	

CONCLUSION. In our study, etomidate is related to an increased risk of adrenal insufficiency after cardiac surgery. Large randomized studies are needed to made treatment recomendations.

0334

INFECTIVE ENDOCARDITIS: ICU'S OUTCOMES AFTER CARDIAC SURGERY.

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INTRODUCTION. Infective endocarditis (IE) has a high mortality rate, and the option of surgical treatment must be individually evaluated. In this study we describe the outcomes in that patients who finally underwent cardiac surgery in our hospital.

METHODS. Patients who underwent cardiac surgery between january 2000 and march 2006 in our tertiary care centre, because of IE, were prospectively analized. Of each patient, we collected age, gender, site of endocarditis, native or prosthetic, results of microbiological tests, indication for surgery, complications in the intensive care unit (ICU), ICU and hospital stay, and in-hospital mortality. The statistical analysis was made with the SPSS (Statistical Package for Social Sciences) software for Windows (version 11.0). Predictors of prolonged ICU stay were obtained with linear regression.

RESULTS. A total of 68 patients (men 79%, mean age 61 +/- 4 years old) were included (2% of heart interventions). Mean Euroscore 8 +/- 2. Native valve IE: aortic in 19 (28%), mitral in 11 (16%), and aortic + mitral in 8 patients (12%). Prosthetic valve IE: 30 patients (44%). S. Aureus and S. Epidermidis represents the 25 and 22% respectively. The main indication for cardiac surgery was heart failure (45%). Eight patients (12%) were in shock before surgery. Twelve patients (18%) underwent surgery because of uncontrolled infection. Mean time of cardiopulmonary bypass : 124 +/- 14 min. The mean ICU stay was 9 +/- 4 days, and the mean hospital stay was 42 +/- 6 days. Complications during ICU stay: acute renal failure in 34 patients (51%), but only in 8 (12%) a continuous renal replacement (CCRT) was used; low cardiac output or prolonged inotropic support in 39 patients (43%); an arritmic event or need prolonged epicardic estimulation in 25 (37%); respiratory complications in 27 (40%), with a median extubation time of 19 +/- 8 hours; neurologic complication in 17 (25%) and multiorgan disfunction (MOD) in 14 patients (21%). Eleven patients (16%) need reintervention because of IE relapse. Infection, MOD and CCRT were related with prolonged ICU's stay. The in-hospital survival was 74% (with a 76% of ICU survivors).

CONCLUSION. Most of the patients had prolonged in-ICU and in-hospital stay, with high morbidity and mortality rates. Infection, MOD and need for CCRT were predictors of prolonged ICU stay. Surgical treatment is nowadays an useful option in selected patients.

0335

SELENIUM APPLICATION IN INTENSIVE CARE MEDICINE

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INTRODUCTION. Selenium is an essential part of the intracellular antioxidant system as a component of the glutathione peroxidase enzymes. Selenium seems to play a role in the regulation of inflammatory processes. The aim of the study was the evaluation of clinical outcome in patients with postoperative extended ICU stay and selenium therapy.

METHODS. In this prospective, randomized, open controlled, not blinded study, we compared the effects of intravenous selenium application. The clinical endpoints were defined as mortality, length of stay (LOS) and time on respirator (TOR). Between 01/2005 to 09/2005, a total number of 74 patients underwent cardiac surgical procedures and had a prolonged postoperative stay on the ICU (> 5 days). The selenium group was treated with an initial dose of 2000mg IV and a preservation dose of 500mg for 10 days.

RESULTS. The primary reasons for a prolonged ICU stay were caused in a cardiac low output syndromes or respiratory failure. The treatment with selenium was initiated after the 5 day on ICU. We could not detect any beneficial aspect of the therapy. Selenium does not influence the mortality rate, LOS, TOR or the incidence of a septic shock.

CONCLUSION. Long term treatment of critically ill patients admittedly is loaded by a high in-hospital- and follow up mortality. Selenium therapy had not the potential to improve the clinical outcome. A randomized, prospective, double blinded multicenter phase III study including the measurement of selenium serum levels and markers of the inflammatory response, is necessary to describe possible benefits.

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0336

CEREBRAL HISTOPATHOLOGIC LESIONS IN EARLY PORCINE ENDOTOXEMIA

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INTRODUCTION. Brain dysfunction is common in sepsis (1), and alterations in cerebral histopathological structures have been described after bacteremia (2,3). The aim of this study was to assess the relationship between cerebral perfusion and histopathology during early endotoxemia.

METHODS. 12 Animals (weight: 42kg ±4; mean±SD) were exposed to E.coli lipopolysaccharide or saline infusion (n=6, each) for 12 hours. Cardiac output (thermodilution; ml/kg/min), systemic (MAP) and pulmonary artery blood pressure (PAP, mm Hg), and cerebral blood flow (laserDoppler, arbitrary units) were continuously measured. At the end of the experiment, formalin fixed brains were cut in coronal sections and embedded in Paraffin. Afterwards, the sections were cut at 5 microns and stained with HE.

RESULTS. 4 of 6 endotoxemic animals but none of the control group had cerebral tissue lesions (areas of encephalomalacia with spongy degeneration of the white matter and axonal swelling and ischemic neuronal thalamic necrosis). Out of the 4 animals, 3 had also significant vascular changes at the level of venules and small veins predominantly in the brainstem.

TABLE 1.

	CO *, **	PAP *, **	MAP	CBF *, **
Baseline	c: 145±24 e: 145±21	c: 13±2 e: 16±2	c: 103±14 e: 91±23	c: 378±13 e: 351±48
6 hours	c: 145±23 e: 116±20	c: 14±2 e: 24±5	c: 99±13 e: 105±24	c: 301±92 e: 361±94
12 hours	c: 148±12 e: 155±25	c: 13±2 e: 27±4	c: 90±19 e: 87±32	c: 261±45 e: 437±95

*time effect, p<0.05; **: time-group-interaction, p<0.05, c:control, e:endotoxemia*

CONCLUSION. Endotoxemia induced histopathological brain damage which was not related to systemic or cerebral blood flow and pressure.

REFERENCE(S). 1) Bleck T P, Smith M C, Pierre-Louis S J, et al. Crit Care Med 1993;21:98-103.
2) Papadopoulos M C, Lamb F J, Moss R F et al. Clin Sci (Lond) 1999; 96:461-6.
3) Bogdanski R, Blobner M, Becker I et al. Anesthesiology 2000;93:793-804.

0337

PERFORMANCE OF ICU VENTILATORS DURING PRESSURE SUPPORT VENTILATION MODE: A BENCH STUDY

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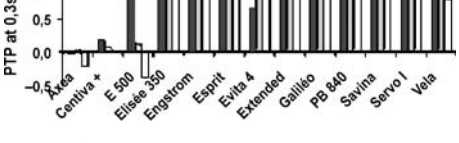
INTRODUCTION. The aim of this study was to evaluate the performance during PSV mode among 13 ICU ventilators (figure).

METHODS. To stimulate spontaneous ventilation, we used a two-chamber lung test (Michigan Instruments). To test inspiratory trigger we used 2 levels of P0.1 (2 & 4 cmH2O) and two levels of PEEP (0 & 5 cmH2O); to assess the pressurization we used 3 levels of respiratory drive (low, moderate and high) and 4 levels of pressure support (5, 10, 15 and 20 cmH2O). We evaluated: 1) time delay (TD, between the onset of the effort and the rise of the Paw) 2) the maximal decrease in airways pressure (DPaw) and 3) the pressure-time product (PTP) at 0.3 sec and 0.5 sec, reflecting the efficiency of pressurization.

RESULTS. Substantial variations were observed among tested ventilators for most variables. For the trigger, differences were moderate. For example with a P0.1=4 cmH2O and PEEP=5 cmH2O, median [range] was 50ms [34;97] for TD and 1.06 cmH2O [0.37;1.92] for DPaw. For pressurization, differences were larger. With high simulated respiratory drive pressure support of 10 cmH20 and Peep of 5 cmH2O, PTP0.3 was 1.44 cmH2O.s [-0.38;+2.16], and PTP0.5 was 3.28[+0.87;+4.64].



CONCLUSION. Despite technological evolution, performances of the tested ventilators are still highly heterogeneous especially in terms of pressurization.

0338

CARDIAC OUTPUT MEASUREMENT BY TWO DIFFERENT PULSE CONTOUR ANALYSIS DEVICES AFTER CARDIAC SURGERY

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INTRODUCTION. The aim of this study was to compare CO determined by two pulse contour analysis devices (FloTrac, Edwards Lifesciences = FCO and PiCCO plus, Pulsion Medical Systems = PCO[1]) with intermittent thermodilution (ICO) in patients after cardiac surgery.

METHODS. 20 patients were included, for one set of data (**A = hemodynamic stable**) CO was assessed after hemodynamic stabilization. Triplicate FCO and PCO values were recorded before ICO was determined by 3 injections at 4 time points with 15 min intervals. For the second set of data (**B = hemodynamic changes**) triplicate FCO, PCO and ICO measurements were recorded 15 min after inducing different body positions (supine, 30° head-up, 30° head-down, supine). Statistical analysis was done using ANOVA (Bonferroni) and Bland-Altman analysis for absolute values and % changes (δ).

RESULTS. CO during **A** ranged from 3.0 to 7.1 l min^{-1} without significant CO changes between measurement points (δFCO = 0.9±13.0%, δPCO = 1.0±11.3%, δICO = 0.6±11.2%). Mean bias±2SD (limits of agreement) was 0.04±1.31 l min^{-1} for FCO-ICO and -0.01±1.09 l min^{-1} for PCO-ICO. Differences of δCO were comparable (mean bias±2SD = 0.3±24.1% for δFCO-δICO and 0.4±20.2% for δPCO-δICO). A range of CO from 2.85 to 8.60 l min^{-1} were obtained during **B** with significant changes of FCO, PCO and ICO between the measurement points (Table 1). Mean bias±2SD was -0.10±1.80 l min^{-1} for FCO-ICO and -0.15± 1.21 l min^{-1} for PCO-ICO. For δFCO-δICO mean bias±2SD was -2.2±46.7% and for δPCO-δICO -4.9±21.2%.

TABLE 1.
CO changes (%) between measurement points during B

	30° head-up positioning	30° head-down positioning	supine positioning
δFCO	-14.9±10.7%*	+37.3±27.7%*	-12.4±15.5%*
δPCO	-8.6±6.9%*	+16.6±9.2%*	-6.5±5.7%*
δICO	-10.4±6.3%*	+24.9±7.8%*	-10.9±5.7%*

*$p < 0.05$

CONCLUSION. CO can be reliably monitored by FloTrac and PiCCOplus during stable hemodynamic conditions after cardiac surgery. FloTrac tended to overestimate induced rapid CO changes when compared to PiCCOplus.

REFERENCE(S). 1. Della Rocca G et al. Can J Anaesth 2003; 50: 707-11.

Grant acknowledgement. This study was supported by a grant from Edwards LifeSciences.

0339

MULTIACCESSCATHETER FOR POWER INJECTIONS

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INTRODUCTION. Power injections of contrast material have become a routine part of many CT protocols for the brain (e.g. CT-Angio), chest (e.g. Pulmonary artery protocols), abdomen and pelvis. Data regarding the feasibility and safety of power injections through central venous catheters is limited. Unfortunately, in many critically ill patients no peripheral access can be obtained. We therefore designed an in-vitro experiment to test the use of the MAC Multiaccesscatheter (Arrow international, Reading USA) for power injections in a range from 3 ml/sec to 10 ml/sec.

METHODS. The MAC consists of three lumina (Lumen A: 12 Gauge, Lumen B: Distal 9 F with an 8 F catheter) and a one way valve secured introducer port for PA-catheters or additional multilumencatheters). MAC's from different lots were immersed in a water bath and connected to a Power Injector (Stellant Dual Injector by Medrad). Contrast medium (Omnipaque 300) was injected with flow rates of 3 ml/sec, 5 ml/sec, 8 ml/sec and 10 ml/sec. Contrast flow was recorded on video and catheter movement was graded as none, minimal, mild or severe by an observer blind to the pressure injected. Pressure curves were obtained from the Injector. Lumen A and B were injected with and without the presence of a PA-catheter through the introducer port and with or without a simulated catheter obstruction (hemostat on the distal third of the catheter). A conventional triple lumen catheter was used as control at the mentioned flow rates.

RESULTS. Power injections up to 8 ml/sec were possible through Lumen A and B, with or without a PA-catheter in place, without any signs of catheter damage. At a flow rate of 10 ml/sec the injection was stopped by the Injector because the pressure limit of 325 psi was reached. With complete obstruction an injection through Lumen B caused the one-way membrane of the introducer port to rupture and release contrast medium at a continuous flow rate with 134 PSI.
While the conventional triple lumen catheter demonstrated a jet phenomenon with a severe whiplash movement the stiffer MAC did not show movement at flow rates up to 3 ml/sec and minimal movement at the higher flow rates.

CONCLUSION. Power injections up to 8.0 ml/sec can be safely performed through a MAC with or without a PA catheter in place through the introductory port. Complete catheter obstruction can result in destruction of the one-way valve of the introductory port.
The reduced mobility of the MAC makes him favorable compared to conventional triple lumen catheters for power injections.

Grant acknowledgement. The catheters for this study were provided free of charge by Arrow international, Reading USA.

0340

HOW BISPECTRAL INDEX (BIS) COMPARES TO ENTROPY AND A-LINE ARX INDEX (AAI) IN THE SAME PATIENT

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INTRODUCTION. Bispectral index (BIS) monitoring of depth of anesthesia has pioneered the field for more recent monitoring devices like the A-line ARX Index (AAI) or the state (SE) and response entropy (RE) monitoring devices. Following an observational design the present study aimed to compare simultaneously in the same, normothermic patient recorded BIS, AAI and entropy (e.g. RE, SE) values.

METHODS. Data from patients (n = 33) undergoing minor gynecological operations were analyzed. Boli of fentanyl and of propofol were given to induce anesthesia. To maintain anesthesia propofol and remifentanil were infused. At the anesthetist's preference, either an endotracheal tube or a laryngeal mask was used for airway management. Before induction of anesthesia commercially available AEP electrodes, BIS and entropy sensors were simultaneously placed on the forehead. BIS, AAI and entropy value recordings were started at 3 minutes before induction of anesthesia and continued until transfer of the patient to the postanesthesia care unit. Markers were set at defined landmarks. The anesthetist responsible for the patient was deliberately unaware of AAI, BIS and entropy values during the operation.

RESULTS. The prediction probability (Pk) of BIS (0.99+/-0.0004) and AAI (0.97+/-0.001) was comparable and better than that of SE (0.88+/-0.0075) or RE (0.86+/-0.0072).

CONCLUSION. During uneventful anesthesia, e.g. without patient movement provoked by surgical stimulation, BIS and AAI values showed better correlation than did AAI and entropy or BIS and entropy values. Agreement, however, between BIS, AAI and entropy on patient state (e.g. awake, inadequate anesthesia, optimal or deep anesthesia) did not exceed 20%.

0341

OUTCOME IN SEPTIC SHOCK PATIENTS WITH HEMATOLOGIC MALIGNANCIES: IMPACT OF PREVIOUS CHEMOTHERAPY.

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INTRODUCTION. Developing septic shock after having received chemotherapy is often considered as the worst case scenario in hematology. The aim of this study was to compare the characteristics and outcome in septic shock patients with hematologic malignancies who received vs. who did not received i.v chemotherapy within 3 weeks before ICU admission.

METHODS. Prospective observational study of all consecutive patients with hematologic malignancies admitted in the ICU with septic shock between 2000 and 2006. The diagnostic certainty (documented vs. clinically suspected bacterial infection and presence or absence of non-bacterial infection) and the site of infection (pulmonary vs. non-pulmonary) were assessed by an independent panel of physicians blinded to the patients' outcome. Severity of illness on day 1 was assessed by the SOFA and a cancer specific severity of illness score (CSSIS) [1]. Multivariate logistic regression was used to identify early (<24 hrs) predictors of hospital mortality.

RESULTS. Over the study period, 100 septic shock patients with hematologic malignancies were admitted. Forty-five percent received previous i.v chemotherapy. The ICU, hospital and 6 months mortality in patients with vs. without previous chemotherapy was 29% vs. 53% (P=0.025), 48% vs. 64% (P=0.15) and 54% vs. 71%(P=0.08), respectively. Patients who received chemotherapy were younger (52 $\pm$ 19 vs. 64 $\pm$ 12 years, P<0.001), more often had a high grade malignancy (80% vs. 36%, P<0.001), were more often neutropenic (62% vs. 20%, P<0.001), less often had a pulmonary site of infection (42% vs. 69%, P=0.009) and were less often ventilated (62% vs. 84%, P=0.02) and dialysed (13% vs. 35%, P=0.02) during ICU stay compared to those without. However, we found no difference in SOFA (11.1 $\pm$ 2.8 vs. 12.1 $\pm$ 3.4, P=0.12), noradrenaline dose (335 $\pm$ 416 vs. 451 $\pm$ 577 ng/kg/min, P=0.26), previous antibiotic use (53% vs. 47%, P=0.68) neither in non-bacterial infections (20% in both, P=0.99) between these groups. Both had similar expected mortality rates according to the CSSIS (79% vs. 84%, P=0.15). In a multivariate analysis, age (OR 1.06; 95%CI 1.02-1.1), SOFA (OR 1.24; 95%CI 1.05-1.48), high grade malignancy (OR 3.9; 95%CI 1.2-12.8) and pulmonary infection (OR 3.24; 95%CI 1.1-9.3) were associated with the outcome.

CONCLUSION. Septic shock complicating active chemotherapeutic treatment has a better prognosis than commonly perceived. This might be explained by the lower incidence of pulmonary infection in this group.

REFERENCE(S). 1) Groeger et al. J Clin Oncol 1998;16:761-770.

0342

EFFECT OF END INSPIRATORY FLOW ON CONFIGURATION OF VIBRATION RESPONSE IMAGING (VRI) WAVEFORM

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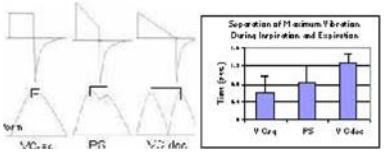
INTRODUCTION. Vibration response imaging (VRI) measures vibration energy generated from airflow to create a dynamic image of respiration process and the software in the VRI device provides a waveform displaying the total vibration intensity from the lungs over time. We investigated the effect of end inspiratory flow on configuration of VRI waveform in mechanically ventilated patients.

METHODS. We performed serial VRI recordings during assisted volume control ventilation with the square (VC-sq) and decelerating (VC-dec) flow patterns and pressure support (PS) ventilation in 5 mechanically ventilated patients. Time between peak inspiratory and peak expiratory vibration was measured and t-test was performed.

RESULTS. There is a difference in the separation of peak inspiratory and expiratory vibration between VC-sq, PS and VC-dec with p values of 0.0178 for VC-sq versus PS, 0.01 for VC-sq versus VC-dec and 0.048 for PS versus VC-dec (Fig 1).



CONCLUSION. End inspiratory flow determines the distance between peak inspiratory and expiratory vibration in VRI respiratory cycle waveforms. In mechanical ventilation, the flow at the end of inspiration in VC-sq is maximal, less in PS and almost zero in VC-dec. Lower flow at the end of inspiration causes greater separation in VRI waveforms. When inspiratory flow persists at the time of ventilator cycling, this energy must be dissipated prior to reversal of flow with expiration. The lack of separation between peaks reflects the persistence of this energy. VRI waveform analysis may provide clinically useful physiologic information for adjustment of mechanical ventilation.

0343

ASSESSMENT OF SEDATION IN ICU: BISPECTRAL INDEX VALUES COMPARED TO RAMSAY AND CIA SCORES

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INTRODUCTION. To avoid oversedation in critically ill patients is a daily challenge. All methods to assess the level of sedation retain the possibility of variability in measurements. The bispectral index (BIS), based on EEG readings, is nowadays available to measure the effect of hypnotic and sedative drugs. In this study we aim to compare BIS values in sedated patients with two validated subjective scores, the Ramsay sedation and critically ill assessment (CIA) scores.1

METHODS. A total of 400 observations were collected in thirteen patients during a period of minimal 12 to maximal 64 hours on a general ICU. All patients were mechanically ventilated and received analgesic and sedative medication. Level of consciousness was prospectively evaluated using the Ramsay and CIA scores. BIS measurements were continuously monitored and together with Ramsay and CIA scores recorded every hour. Median BIS values were analyzed for different Ramsay scores. Overall and intra-individual correlations between BIS and CIA scores were calculated.

RESULTS. Median age of patients was 79 (range 40-86 years). Median BIS value during daytime was 50 (IQR 40-65) and during nighttime 47 (IQR 40-63). Almost 80% of the Ramsay assessments ranged from a score of 5 to 6. Median BIS values when Ramsay was scored 5 or 6 was 45 (IQR 39 to 53) (n=287). Median BIS values when Ramsay was scored 3 or 4 was 72 (IQR 51 to 82) (n=77). BIS measurements ranged from 0 to 75 when a minimal CIA of 5 was scored. Overall correlation between BIS and CIA was 0.55 (n=128) with intra-individual correlations ranging between -0.36 and 0.85.

CONCLUSION. The correlations between Ramsay or CIA scores and BIS values were suboptimal and inconsistent in our study population. Individual Ramsay and CIA scores were reflected by a broad range of BIS scores. Especially in patients with CIA scores above 10 or Ramsay scores above 4, BIS scores varied widely. Further studies as to how BIS-values should be scored (with or without addressing the patient) and change of BIS-values in reaction to administration of sedative medication are needed to determine if BIS monitoring can guide sedation and prevent oversedation in patients under intensive care.

REFERENCE(S). 1 Schoonderbeek F J, et al. The Critically Ill Assessment scale. Critical Care 2005, 9(suppl. 1):p 143.

0344

A NEW ISOLATED PERFUSED RAT SMALL BOWEL MODEL FOR ANALYSIS OF INTESTINAL OEDEMA FORMATION

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INTRODUCTION. Septic multi-organ failure is a life-threatening condition in critically ill patients. Intestinal malperfusion leading to bowel oedema with disturbed permeability and bacterial translocation may initiate the development of sepsis. Up to now, there exists no experimental model allowing a systematic analysis of molecular mechanisms of intestinal oedema formation and possible therapeutic options. Therefore, we developed a new ex situ model of an isolated perfused rat small bowel for studying intestinal oedema formation.

METHODS. The small bowel was isolated in female Wistar rats (body weight: 230-250 g). Cannulas were inserted into the proximal and distal small intestine as well as into the superior mesenteric artery and portal vein. The isolated small bowel was then transferred into a specially designed temperature-controlled, moist chamber with a built-in weighing system. The bowel weight could continuously be measured as no organ bath was used. Modified DMEM cell culture medium containig tetramethylrhodamine isothiocyanate (TRITC) albumin was used for luminal bowel perfusion. Vascular perfusion was performed with oxygen-enriched artificial plasma with human red blood cells and fluorescein isothiocyanate (FITC) albumin either in a pressure- or flow-controlled mode. Vascular and intraluminal pressures and flows were continuously recorded. Lymphatic vessels were opened and the lymphatic fluid collected allowing the quantification of lymphatic fluid production. The fluorescent albumins added to both the vascular and intraluminal fluids allowed the characterization of fluid fluxes among different compartments.

RESULTS. In this new model, vascular, luminal and lymphatic flows, arterial, venous and intraluminal pressures and bowel weight can be monitored simultanously. The initial experiments revealed that the bowel was vital and stable for at least 3 hours. This was confirmed by histological techniques and by measuring the oxygen and glucose consumptions, lactate-to-pyruvate ratio and arterial-to-venous lactate dehydrogenase (LDH) concentration difference. First experiments with administration of platelet activating factor (PAF) showed vasoconstriction and development of bowel oedema comparable to former findings in the isolated lung.

CONCLUSION. The presented model of an isolated perfused small bowel allows the separation of the vascular, luminal, extracellular and lymphatic compartments. We expect the model to be suitable for establishing the molecular mechanisms of bowel oedema formation.

0345

COMPARATIVE STUDY BETWEEN INTRAVENOUS IMMUNOGLOBULINS AND STANDARD TREATMENT IN SEPTIC PATIENTS

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INTRODUCTION. Introduction: The use of IVIG in the treatment of human sepsis remains controversial. The aim of this study was to assess the effects of IVIG in patients with severe sepsis with or without septic shock on mortality and morbidity compared to standard treatment of sepsis.

METHODS. Material and methods: This prospective controlled study included thirty-two patients who were randomized according to the type of sepsis treatment into: 16 pts received standard treatment of sepsis plus IVIG and 16 pts who received standard treatment of sepsis and served as controls. Ig-M enriched IVIG was given by dose of 5ml/kg/day for 3 consecutive days. APACHE-II and SOFA scores were calculated on days 1,4 then day 14. Recording of any side effect related to IVIG therapy was done to test the drug tolerability. Serial levels of serum IL-1, IL-6, L-10 and serum CD14 were measured daily. „α TNF-

RESULTS. Results and discussion: Compared to conventional treatment of sepsis, IVIG reduced APACHE-II and SOFA scores significantly on day 14 of hospitalization. Serum PCT level showed significantly consistent decline from day 1 to day 14 in IVIG-treated pts of the entire group as well as severe sepsis and septic shock subgroups. The PCT level always showed rise in conventionally treated pts from day 1 to day 14 in the entire group, severe sepsis and septic shock subgroups. Significant decline in the serial CD14 and IL-I levels from day1 to day 5 occurred in IVIG-treated entire group of pts as well as severe sepsis and septic shock subgroups of pts. Mortality rate was significantly lower in IVIG-treated pts with severe sepsis compared to conventionally treated pts (40% vs 70%). In IVIG-treated pts with septic shock, the mortality rate was 100% just like that of the conventionally treated pts with septic shock.

CONCLUSION. Used early enough, IVIG therapy induces substantial improvement in morbidity and mortality in patients with severe sepsis, but couldn't demonstrate any beneficial effect on morbidity or mortality rate in patients with septic shock. The improvement in the clinical course and ultimate outcome of severe sepsis is paralleled by a consistent decline in serum levels of IL-6, PCT and CD-14.
Key words: Sepsis, IVIG, Cytokines, PCT, APACHE II score and SOFA score.

0346

A NEW MONITORING SYSTEM TO PREVENT LIFE-THREATENING CRISIS ON THE REGULAR FLOOR

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INTRODUCTION. In-hospital cardiac arrests, intensive care unit (ICU) admissions and unexpected deaths are commonly preceded by warning signs 24 hours before the acute event. Appropriate alarm system detected deterioration are needed to allow an early intervention, this is the focus of our study.

METHODS. The Bio Sign algorithm (Oxford signal, oxford, UK) uses 5 physiological parameters (heart rate [HR], respiratory rate [RR], blood pressure [BP], arterial oxygen saturation [SpO2] and temperature [T]) to generate a single measure. This so-called Bio Sign Index. represents the probability that a patient's physiological data is different from the normal data for a representative group of patients on whom the Bio Sign algorithm was trained. Whenever the Bio Sign Index exceeds a preset threshold of 3.0 for four minutes out of a five-minute period, the monitor is deemed to have detected an event. We monitored 16 patients on three different wards (a stroke unit, a haematology unit and an intensive care unit) including 8 patients at risk of development of complications and 8 patients at the end of their life (with "do not resuscitated" order)

RESULTS. The recording were analyzed by two independent observers (Table 1). Positive predictive value of the Bio Sign signal was 86%. Most of the artefactual Bio Sign Alarms were due to the temperature probe losing contact (15 out of 38 artefactual Alerts - 39%). Despite frequent artefactual decreases in the SpO2 readings, only 4 of these caused an artefactual Bio Sign Alarm.
In the 8 patients who died without intervention (end-of-life decision) the mean time between the Bio Sign alarm and the cardiac arrest was 2h 46 min [range : 20 min – 7h].

TABLE 1.
Table 1: True or False alarms

	Total Alarm	True Alarm	False Alarm
Observers 1	253	218	35
Observers 2	266	228	38

CONCLUSION. Bio Sign Alerts identifies life threatening alterations with a high predictive value (86%). It can help to intervenence before crisis occurs.

0347

NONINVASIVE VS. INVASIVE LOW DOSAGE OF INDOCYANINE GREEN (ICG) PDR AFTER LIVER TRANSPLANTATION

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INTRODUCTION. Indocyanine green plasma disappearance rate (ICG-PDR) obtained non invasively in the early postoperative period after orthotopic liver transplantation, has been shown to be a valuable parameter to predict graft function and clinical outcome [1]. However few data exist on the reliability of this system using low dosages of ICG in patients with an hyperdynamic circulation and poor liver function [2].

METHODS. We studied 29 patients after OLTx, who received a 4F aortic catheter with an integrated fiber-optic device and a thermistor (Pulsiocath 4F PV2024L, Pulsion Medical Systems, Munich, Germany) via the femoral artery sheath connected to a computer system (COLD-Z021, Pulsion Medical Systems), and an ICG finger clip connected to a liver function monitor (LiMon, Pulsion Medical Systems). Through a venous central access 0.3 mg/Kg of ICG (Pulsion Medical Systems) was injected, and data were simultaneously obtained. Most of the patients had more than one ICGPDR evaluation in different days. For statistical analysis data were compared with linear regression and according to Bland-Altman analysis.

RESULTS. 56 measurements were obtained from 29 patients (range 1-3, median 2). $PDRICG_{INV}$ was 21.43±12.43%/min (mean±SD) (range 4.3-48.1%/min), and $PDRICG_{NINV}$ was 18.79±10.13%/min (range 4.1-38.0%/min). Linear regression analysis yielded the equation $PDRICG_{NINV}$=2.93±0.73x$PDRICG_{INV}$, with a correlation coefficient ofr^2 =0.81 (p<.0001). The Bland-Altman analysis showed a mean bias of 2.92±5.34%/min for all data. When the $PDRICG_{INV}$ was less than 18%/min (n=20), the value that predicted a good clinical outcome of the graft, the agreement between the two methods resulted in a mean bias of 0.75±2.15%/min, with an equation of $PDRICG_{NIVN}$= 0.88±0.41x$PDRICG_{INV}$ (r^2=0.75, p<.0001).

CONCLUSION. Among tests used to monitor liver function, ICG clearance has demonstrated a good correlation with outcome in liver transplanted patients. But higher dosages of ICG are needed using noninvasive in comparison with invasive techniques increasing costs. In our liver transplanted patients, even with a low dosage of ICG (0.3 mg/Kg) the PDRICG obtained noninvasively demonstrated a good clinical accuracy in cases of good as in poor graft function, compared with the invasive determination.

REFERENCE(S). 1. Hori T, et al. Liver Transplant (2006);12:605-613.
2. Sakka S, et al. Intensive Care Med (2004);30:506-509.

0348

COMPARISON BETWEEN BLOOD TEST RESULTS FROM RAPIDLAB1265 AND THE HOSPITAL LABORATORY IN ICU PATIENTS.

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INTRODUCTION. Fast-paced intensive care testing demands that laboratories deliver blood test results as rapidly and accurately as possible. The goal of this study is to define limits of agreement between sodium, potassium, chloride, glucose, lactate and haemoglobin results from the delocalized Rapidlab 1265 blood gas analyzer and the central laboratory in our critically ill patients. In a previous study, 89 minutes were so gained (1).

METHODS. The 3-month prospective observational study was approved by the ethics committee. For each studied patient, a single arterial blood sample was taken. A first part was drawn by a 2 ml syringe to be processed by the blood gas analyzer Rapidlab1265 located inside the intensive care unit, the second part was collected by three appropriate tubes and sent by pneumatic conveyor system to the central laboratory. Na, K, Cl, glucose, lactate were measured on Modular System and haemoglobin on a Celldyn 4000 analyzer. The Bland and Altman's method determined the limits of agreement between the results.

RESULTS. Table 1 describes for each parameter the number of comparisons, the observed range values in the central laboratory (minimum - maximum), the skew and the 95% limits of agreement (lower and upper). The skew represents laboratory value minus Rapidlab value.

TABLE 1.

	Number of comparisons	Units	Minimal range value	Maximal range value	Skew	Lower limit of agreement	Upper limit of agreement
Sodium	204	mmol/L	113	151	-2.5	-6.1	1.1
Potassium	203	mmol/L	2.8	6	+0.1	-0.1	+0.3
Chloride	204	mmol/L	75	118	-2.0	-6	+2
Glucose	202	mg/dL	68	494	-1	-16	14
Lactate	187	mg/dL	4	147	-0.8	-5.2	+3.8
Haemoglobin	187	g/dL	5.4	16.2	-0.2	-0.6	0.4

CONCLUSION. The agreement between the two methods seems to be satisfactory in the studied population.

REFERENCE(S). 1. Roman A, et al. Comparaison entre le taux d'hémoglobine répondu par un analyseur délocalisé et le laboratoire central hospitalier. Réanimation. 2006; 15: SP 174.

0349

COMPARISON OF VPW AND PICCO DERIVED HAEMODYNAMIC MEASUREMENTS IN PATIENTS OF A GENERAL ICU

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INTRODUCTION. Assessing the intravascular volume status of critically ill patients can be exceedingly difficult. Due to concerns about the efficacy and safety of using invasive haemodynamic monitoring, non-invasive diagnostic testing has gain increasing importance. We try to compare the reliability of VPW as an indicator of overload, in patients of a general ICU, with a method of invasive haemodynamic monitoring that has proved in literature and in every day practice his efficacy.

METHODS. Vascular Pedicle Width (VPW), which represents the mediastinal silhouette of the great vessels, was compared to the haemodynamic measurements, which were obtained with the method of transpulmonary thermodilution (PiCCO Plus, Pulsion Munich). We measured the VPW in anteroposterior chest x-rays in supine position, with standard parameters, in 50 patients without prior cardiac surgery, prior mediastinal irradiation, obesity, severe ARDS and PEEP. In every patient we perform invasive haemodynamic monitoring with PiCCO Plus. ITBI > 1000 ml/m2 and GEDI > 800 ml/m2, ELWI > 7.0 ml/kg were considered as the markers of significant volume overload.

RESULTS. The mean VPW in overloaded patients was 79.85 cm compared to a mean of 63.71 cm for the rest. The results were subsequently analyzed using Spearman's non parametric test and we found good correlation (0.802, 0.788, 0.510) between VPW and GEDI, ITBI, ELWI, respectively. The results were considered statistically significant ($p < 0.000$, $p < 0.000$, $p < 0.005$) respectively.

CONCLUSION. VPW when appropriately assessed at bedside using portable chest x-rays might give very useful information regarding volume status of the patients, results that are comparable in their efficacy to those obtained with invasive and more expensive methods.

Poster Sessions
Ethics: End-of-life and other ethical issues
0350-0363

0350

ADMISSION OF THE OLDEST PATIENTS IN ICU

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INTRODUCTION. To analyze epidemiological characteristics of very elderly patient (aged higher than 84 years) admitted to the Intensive Care Unity, and a good indication admission, mortality and the risk factors associated to it.

METHODS. Descriptive study patient older than 84 years admitted in a ICU during 4 years. We recorded age, sex, admission type, length of stay, severity of illness (APACHE II), main diagnosis, procedures, mortality. Comparison of averages was performed by using t Student; comparison of proportions Chi2 test. $p<0.05$ denoted statistical significance.

RESULTS. N=80 (comprised 7% of the all population admitted (1326)). Average of age 87 years old, length of stay 2.13 days. 62% admitted by Emergency Department and 19% by Emergency room operator. 22% died. APACHE II 14. Main diagnosis: heart diseases (72%), (ischemic heart 35%), surgery diseases 17%, respiratory 13%. Procedures in 64%: pace marker 33%, mechanical ventilation 22%, non invasive mechanical ventilation 8%. Main differences within died and survivors ($p<0.05$): length of stay (2 days in died versus (vs) 3), APACHE II (21 vs 12), diagnosis more frequently are heart diseases (58% vs 30% in survivors)(ischemic heart diseases 54%), and surgical diseases (22% vs 12%). Different intensive procedures in died patients (85% vs 64%), the more frequent is a mechanical ventilation (75% in died vs 10% in survivors), and the less frequent is the pace maker (20% in died vs 35% in survivors).

CONCLUSION. The very oldest patient admitted in ICU is a short percentaje, origining a very short lenght of stay. Mortality and the severity of illness is higher than the rest od the population described in the bibliography. Mortality in very old patient admitted to ICU are associated to severity of illness, heart diseases, emergency surgical treatment and the needed of mechanical ventilation too. The age was not explained the practice of providing less aggressive care to elderly patients, because higher than 80% of the patients survive, thus it is not relevant criterion for ICU admission.

REFERENCE(S). Chelluri L, Im K, Belle S H, Schulz R, Rotondi A J, Donahoe M P et al. Long term mortality and quality of life after prolonged mechanical ventilation. Crit Care Med 2004; 31(1): 61-9.

0351

VERY OLD PATIENTS (OLDER THAN 85 YEARS) AT A MEDICAL ICU: INDICATIONS, INTERVENTIONS, OUTCOME

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INTRODUCTION. The part of elderly people in the population has been increasing during the last decades. In 1995 16% of the Middle-European population have been older than 65 years, up to the year 2010 there should be an increase up to 22%. German investigations have shown that a 1/3 of the population older than 65 years are suffering from 3-4 chronic diseases, 98% of the population older than 80 years at least from one chronic disease.
Through those facts the number of old patients admitted to our ICUs is increasing. Aim of following paper was to objective the treatment and outcome of very old patients (older than 85 years) at a medical ICU over a two years period (01.01.1999 - 31.12.2000).

METHODS. 1098 patients had been admitted to our ICU during the study period, 60 (5.5%) older than 85 years. At admission the APACHE II-score ranked between 16 and 36. Indications had been mainly cardial (36), metabolic/intoxications (9), gastrointestinal (6), outside CPR (6) and acute respiratory failure (3).

RESULTS. It was necessary to ventilate 12 patients (20%) for 1-8 days (mean 3 d), 7 patients received a cardiac pacemakersystem, 5 underwent endoscopical interventions, 4 thrombolysis (due to acute myocardial infarction 100mg Alteplase "front loaded"), 4 patients PCI (in two patients an IABP was inserted) and one female patients ACBG.
Duration of stay had been 3.8 d (overall 5.6d), mortality 26.7% (overall 14.75%).

CONCLUSION. Comorbidity and mortality had been naturally higher in patients older than 85 years compared to all patients admitted to our ICU during the study period. 6 month after the ICU stay 24 patients (54.5%) had been still alive with reported good quality of life. We belive that despite higher mortality at the ICU even very old patients benefit from ICU stay and critical care interventions.

REFERENCE(S). Reiger J, Grimm G, Palasser A, Trattnig Th, Vorderegger A: Der sehr alte, über 85-jährige Patient an einer medizinischen Intensivstation: Indikationen, Interventionen Outcome. Intensivmed 40:301-304 (2003).
Suresh R, Kupfer Y Y, Tessler S: The "greying" of the intensive care unit: demographic changes 1988-98. Crit Care Med 27:A27 (1999).
US Concensus Bureau: Projections of the Population, by age and sex 1995-2050. U.S. Government Printing Office, Washington DC (1996).

0352

DECISIONS REGARDING END OF LIFE CARE ARE AFFECTED BY RACIAL DIFFERENCES.

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INTRODUCTION. The decisions regarding the processes at the end of life of are complex and influenced by many factors including religious, education level, and cultural. We investigated the common characteristics of the individuals who died in our ICU with focus on the frequencies of withdrawal of supportive measures.

METHODS. We performed a retrospective chart review of all patients who died within our 53 bed combined oncological medical and surgical ICU. All patients admitted between 9/01/04 to 8/31/05 were included in the study. Data collected included, but were not limited to, demographics, cancer type, the initiation of the terminal wean, and utilization of Comfort Measures Order Sets (CMO). An extensive chart review including nurses, pharmacy and respiratory therapy records to determine data accuracy was performed. Race description and religious affiliation was patient reported. Financial class is reported by this institution in relation to methods of payment.

RESULTS. During the study period, a total of 287 medico-surgical patients died in our ICU; among them, 203 whites versus 84 nonwhites (nonwhites included African American, Hispanic, Asian and Middle Eastern). Overall there were 94 patients who elected to have a discontinuation of life supportive measures, 76 white and 18 nonwhite for a percentage of each group of 37.4 and 21.4, respectively ($p<0.01$). Among the 76 white patients, 53(69.7%) had CMO sets; whereas, 11 out of 18 nonwhites (61.1%) had CMO sets completed (p=NS). There were no significant differences between whites versus nonwhites in frequencies of cancer types, financial class, or religious affiliation.

CONCLUSION. Whites had a significantly higher frequency of self determined discontinuation of life supportive measures than nonwhites. Since we found no differences in the types of cancers, religious affiliations, or financial class; we suspect the differences are probably related to cultural viewpoints within these groups. However, this cannot entirely be determined from this study. Further, there is a small difference in the CMO utilization rate between the two groups studied, but, these numbers are not statistically significant and thereby do not allow for any conclusions.

0353

CHANGE IN END-OF-LIFE PRACTICES BY SEQUENCE OF ENROLLMENT IN EUROPEAN ICU'S: THE ETHICUS STUDY

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INTRODUCTION. End-of-life practices (EOLP) may vary over time especially when one is involved in an EOLP study.

METHODS. Data collected prospectively in 37 European ICU's in 17 countries during 18 months (m) and divided in 3 consecutive groups of 6 m, including EOLP category [1] (CPR, WH and WD therapy, shortening of dying process - SDP), information about pt wishes, discussions with pt and families, and time from ICU admission to first limitation of therapy and from first limitation of therapy to death.

RESULTS. Of 31417 pts, 4248 were included. Changes in EOLP [n (%)] over time are seen on table 1. Median time from ICU admission to 1st limitation of therapy (days) was 3.5 (0-6 m), 2.5 (7-12 m) and 3.0 (13-18 m), p=0.001. Median time from 1st limitation of therapy to death (hours) was 15.3 (0-6 m), 17.6 (7-12 m) and 11.3 (13-18 m), p=0.0001.

TABLE 1.

	0-6 m	7-12 m	13-18 m	p
EOLP: CPR	275 (22)	276 (19)*	281 (23)	
EOLP: WH	503 (40)	617 (43)*	474 (38)	0.04
EOLP: WD	449 (36)	487(34)*	462 (37)	
EOLP: SDP	28 (2)	42 (3)*	24 (2)	
Information about pt wishes	295 (27)	299 (24)	235 (23)	ns
Discussion with pt	31 (3)	32 (3)	33 (3)	ns
Discussion with families	633 (65)	778 (68)	696 (73)	0.001

**The percentages do not add up to 100 because of rounding errors.*

CONCLUSION. More discussions with families and quicker limitation decisions occurred over time in an EOLP study.

REFERENCE(S). 1 JAMA (2003) 290: 790-793.

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0354

END-OF-LIFE DECISION MAKING PRACTICES IN A UNITED KINGDOM INTENSIVE CARE UNIT

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INTRODUCTION. End-of-life decisions are common in intensive care units. The majority of intensive care unit (ICU) patients who are dying or are subjected to EOL decisions lack personal decision making capacity. There is increasing public interest and expectation that there is more family involvement in these complex decision making processes. EOL care decisions, processes, and discussion with family are often poorly documented and not subjected to regular evaluation or audit [1]. We undertook a retrospective study of patients who had been admitted to a university teaching hospital ICU during 2005 where there had been a decision to withdrawal treatment.

METHODS. Case notes of 100 consecutive patients where an EOL decision was made were reviewed. Data collected included age, sex, APACHE II score on admission, timing of EOL decision, mode of withdrawal, time to death, and communication with next of kin (NOK).

RESULTS. The mean APACHE II score on admission was 20.1. 43% of patients were female. Median time from ICU admission to EOL decision was 2.38 days (IQR 0.93-6.31). Extubation to air was the mode of withdrawal in 37% of patients. 99 patients died in hospital and 1 survived to hospital discharge. Median time of decision to withdrawal to death was 4 h 39 mins (IQR 1 h 44 mins - 15 h 11 mins). Median time to death in the extubation group was 4 h 48 mins (IQR 2 h 20 mins - 23 h 29 mins) and in the non-extubated group was 4 h 5 mins (IQR 1 h 39 mins - 10 h 32 mins) (p=0.19). EOL decisions were discussed with NOK in 97% of cases. 3% of patients had no nominated NOK. The median number of documented discussions was 2 (IQR 2-4). 7% of patients participated in their EOL decision.

CONCLUSION. Communication NOK was significantly higher than previously documented [2]. In our series median time to death from EOL decision was less than 5 hours and extubation did not appear to influence time to death.

REFERENCE(S). 1. Carlet J, Thijs G, Antonelli M, Cassel J, Hill M, Cox P, Hinds C, Pimental J M, Reinhart K, Thompson B T (2004) Challenges in end-of-life care in the ICU. Statement of the 5th International Consensus Conference in Critical Care: Brussels, Belgium, April 2003. Intensive Care Medicine 30:770-784.
2. Cohen S, Sprung C, Sjokvist P, Lippert A, Ricou B, Baras M, Hovilehto S, Maia P, Phelen D, Reinhart K, Werdan K, Bulow H-H, Woodcock T (2005) Communication of end-of-life decisions in European intensive care units. Intensive Care Medicine 31:1215-1221.

0355

DNAR DIRECTIVES IN THE HIGH DEPENDENCY UNIT: A PROSPECTIVE OBSERVATIONAL STUDY

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INTRODUCTION. Do not attempt resuscitation (DNAR) directives should be an integral part of patient management. There is no published data about DNAR decision-making on high dependency units (HDU). Our objective was to investigate prevalence and factors associated with an explicit DNAR directive in HDU.

METHODS. Patients admitted to the HDU over 6 months were enrolled. We recorded demographics, severity scores, admission diagnosis, and resuscitation directives. Where no explicit directive was made, an implicit directive for resuscitation was assumed.

RESULTS. 205 consecutive patients were included; age 62±18 yrs, mean APACHE II 16±6.2 and mean SOFA 4.9±2.8. 67 patients (33%) had directives established, of which 5 (7.4%) were established prior to HDU admission. Directives were established within 24 h of HDU admission (95% CI 0.4–1.6 days). No directives were established by family physicians. Of these 67 directives, 9% were for resuscitation. Independent predictors of an explicit directive are shown in table 1. The strongest predictors were prior functional impairment, previous stroke, and the inability to make an informed decision.

TABLE 1.

Factors	DNAR directiveOR (95% CI)	P value
Age	1.04 (1.01 to 1.07)	0.01
APACHE II	1.1 (1.02 to 1.2)	0.04
SOFA	1.1 (1.05 to 1.3)	0.01
Prior functional impairment	4.7 (2.2 to 9.2)	<0.001
Previous Stroke	3.9 (1.4 to 10.8)	0.008
Respiratory Failure for NIV	2.7 (1.3 to 5.6)*	0.009
Incapacity to consent	9.1 (2.4 to 34.8)	0.001

**This may reflect compliance with the British Thoracic Society guidelines for NIV*

CONCLUSION. Our study suggests that DNAR decisions relate most strongly to prior functional state, and thus could be predicted and discussed prior to admission to HDU. After admission, patients for whom these decisions are made, are unlikely to be able to participate, through limited capacity.

0356

END OF LIFE ATTITUDES OF FIRST DEGREE RELATIVES OF CHRONICALLY VENTILATED PATIENTS

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INTRODUCTION. Chronic ventilation is an available treatment option for patients with various end-stage pulmonary, cardiac and neurological diseases. In Israel, legal, social and religious issues prohibit disconnection from the ventilator in dependant patients. Therefore, the population of chronically ventilated patients is rising, requiring adequate chronic ventilation and weaning facilities. This study aims to evaluate attitudes of first degree relatives of patients chronically ventilated in one of these facilities in Israel, regarding end-of-life decisions for their relatives in comparison with their attitudes towards themselves and patients in general.

METHODS. We collected patient demographics, relevant medical information and cognitive function. First degree relatives were interviewed using a structured questionnaire. They were required to address interventions for their relatives such as dialysis, antibiotics and transfusions. They were presented with various hypothetical scenarios such as chronic ventilation, resuscitation and disconnection from the ventilator, in patients with preserved or reduced consciousness. For each scenario they were asked about their wishes for themselves and for patients in general.

RESULTS. 22 relatives of 18 patients were interviewed. 10 patients were male and 8 female. Median age was 75.5 yrs (range 32-90). Median length of ventilation was 23 months (range 1-100). Major diagnoses: Degenerative neurological disease or CVA: 39%, anoxic brain damage 33% and end stage pulmonary disease 28%. 44% of patients were in persistent vegetative state, 56% were conscious, 60% with various degrees of cognitive impairment. 2/18 had been weaned from mechanical ventilation, 6 were partially ventilated and 10 fully ventilated. More than 70% of interviewees wanted further interventions such as dialysis, antibiotics and transfusions for their relatives. 64% requested continued life support, most preferring not to make decisions regarding their relatives. When asked about their wishes for themselves, only 19% and 14% wanted chronic ventilation and resuscitation respectively, if unconscious with minimal chance of recovery and 50% would expect to be disconnected from the ventilator! Regarding patients in general, 50% thought unconscious patients with minimal chance of recovery should be chronically ventilated and resuscitated. 60% felt that legally permitting ventilator disconnection could lead to a "slippery slope".

CONCLUSION. Family members of chronically ventilated patients usually want escalation of medical treatment for their relatives. Most would NOT wish to be chronically ventilated or resuscitated in such situations. Attitudes to patients in general tend towards more aggressive therapy and life prolongation, with cautiousness regarding cessation of ventilation.

0357

CARING AT END-OF-LIFE: VISION AND ATTITUDE OF STAFF

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INTRODUCTION. Complex issues, as interruption of treatment in terminal patients are present in every day activity in an ICU, as so as in media. To know the point of view of the staff is essential to understand attitudes and decisions. This study tried to analyze quantitatively medical prescriptions of patients who died and staff's attitude about therapy discontinuation.

METHODS. Study, retrospective was done in a private general ICU with 23 beds. It was analyzed prescriptions of patients who died after more than 24 hours after admission in the ICU. Period of study was the year of 2005. It was defined as Therapeutic Intensity (TI) the number of item of medical prescription, except the drugs on demand (SOS). The TI was registered in the first 24 hours (TI-1) and in the last 24 hours (TI-2) of ICU admission. The TI was calculated from the ratio TI-2 / TI-1. A research was done with staff about therapeutic withhold of mechanical ventilation, nutrition, fluid management, antibiotics, vasoatives drugs, sedation and analgesia in patients which death is imminent and irreversible.

RESULTS. From 990 admissions, 93 patients were studied. Mean age was 62.5 (SD 15.5), with mean time in ICU of 14.5 days (SD 12.6). TI-1 found was 10.07 (SD 2.07) and the TI-2 was 13.76 (SD 3.89). The analysis of sub-groups with time in ICU less than 7 days did not show difference compared with sub-group with time greater than 7 days. The TI was 1.36. The study showed that medical staff (n=21) agree with withhold of vasoatives drugs (66.7%), antibiotics (61.9%), nutrition (19%) and mechanical ventilation (9.6%) in patients out of treatment. The other staff members (not doctors) [n=54], only agree with withhold of antibiotics (48.4%) and vasoatives drugs (44.4%).

CONCLUSION. Our results showed that the staff has, in everyday practice, a many problems in discontinue therapy in patients out of chance, although theoretically agree with the idea. A debate about end-of-life decisions should begin by respect to points of view of all involved: patients, family and staff.

REFERENCE(S). Rubenfeld G D, Randall Curtis J - End-of-Life Care in the ICU Working Group - End-of-life care in the intensive care unit: a research agenda - Crit Care Med. 2001 Oct;29(10):2001-6.

0358

SYMPTOM RELIEF, SEDATION AND TERMINATION OF LIFE IN A DUTCH ICU: NURSES AND PHYSICIANS OPINIONS

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INTRODUCTION. Euthanasia (the deliberate termination of life (DTL) by the use of drugs at the explicit request of the patient) is very rare in the ICU as most patients are incompetent. We asked which acts ICU nurses and physicians define as alleviation of pain or other symptoms (APS), palliative sedation (PS) or DTL and their opinions about the acceptability of these decisions.

METHODS. A questionnaire, describing 3 cases in 2 stages, was sent to 187 ICU nurses and physicians. 1a: Man, age 40. Multi-organ failure and no chance of improvement. Treatment is withdrawn. Start sedation/opioids. Death in 4 hours. 1b: Discomfort. Administration of sedation/paralyticum. Death in 15 minutes. 2a: Man, age 50. Terminal ALS. Has problems with talking/swallowing. Rejects tracheotomy. Wishes to withdraw non-invasive ventilation. Start continuous morphine infusion. Loss of consciousness after 1 day. Death after 3 days. 2b. Start sedation because of dyspnoe. Death after 1 day. 3a. Man, age 60. Catastrophic cerebral bleeding. Glasgow Coma Score is 6, best motor reaction of abnormal extension. No improvement. Ventilation is withdrawn. Morphine with the intention to shorten life, without informing the relatives. Death after 1 day. 3b. Relatives hand over an advance directive. Extensive deliberation with all involved. Administration of barbiturate/paralyticum. Death after 15 minutes. We asked whether nurses and physicians would define cases as APS, PS or DTL, and about the acceptability of the decisions on a 5-point Likert scale. Decisions that were judged to a great part or fully acceptable are shown.

RESULTS. Preliminary results (n=64) showed diversity. The majority of respondents defined the use of morphine as PS (2a:53%) or as DTS (3a:64%). The use of a sedative in combination with opioids was in the majority defined as PS (1a:63%; 2b:69%). The use of a paralyticum was in the majority defined as DTL (1b:86%; 3b: 97%). APS and PS were judged as acceptable (1a: 84%; 2a: 97%; 2b: 95%). DTL was judged as acceptable by the minority (1b:30%; 3a:11%). The case of DTL at request of the patient (3b) was judged as acceptable by 78%.

CONCLUSION. There is diversity in definitions. The administration of morphine is sometimes determined as PS, or, when doses of morphine are increased with the intention to shorten life, as DTL. ICU nurses and physicians judge APS, PS and DTL at the request of the patient as acceptable.

0359

STAFF ATTITUDES TO DEATH AND DYING IN ICU

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INTRODUCTION. Withdrawal of care is the most frequent cause of death in intensive care units. Information on the decision making process and the methods by which care is withdrawn is sparse. We wished to assess staff attitudes in Intensive Care Units (ICUs) in Scotland.

METHODS. A questionnaire was distributed to all ICUs in Scotland. 18 detailed questions were asked.

RESULTS. 571 responses were received (56%). In dying pateints, 66% alway diable alarms and 25% do so mostly. 46% felt alarms should always be disabled, 35% thought they should be disabled most of the time. Table 1: If the patient is alert and orientated, is and should their poor prognosis and plan of care discussed with them? Table 2. Do and should the family help to decide on level of monitoring in a dying patient?

TABLE 1.
In an alert patient, is and should the poor prognosis and care plan be discussed

	Always	Mostly	Never	Seldom	Sometimes	Unanswered
Is it?	297	159	0	6	95	
Should it?	112	167	11	83	152	32

TABLE 2.

	Always	Mostly	Never	Seldom	Sometimes
Do they?	36	106	149	160	107
Should they?	Inappropriate 58	Less often 56	No change 144	More often 291	Other 22

CONCLUSION. These results give an insight into staff attitudes to death and dying in ICU, as well as current practice. Some of the answers are unexpected. Not only is a poor prognosis and subsequent plan of care not always discussed with an alert and orientated patient, but also staff feel these discussions should be less frequent. In an era of patient autonomy, paternalism of this sort is becoming outmoded. We are unclear why alarms should so frequently be enabled in dying patients. It may be that staff feel insecure without the backup of alarms. The level of family involvement in decisions about monitoring is more contentious and the spread of answers understandable. We hope that these results will eventually allow a consensus to emerge in Scotland about some aspects of palliative care for dying patients in ICU.

0360

ANALYSIS OF ATTITUDES OF PHYSICIANS TOWARDS DECISION TO ATTEMPT OR NOT TO ATTEMPT CPR IN POLAND

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INTRODUCTION. The opinions concerning indications for cardiopulmonary resuscitation (CPR) have been modified for the last 25 years. CPR is known to have a low success rate especially when attempted for patients in poor general condition or terminally ill. Several factors such as ethnic origin, religion, sex have been specified to have impact on physician's acceptance of "do not attempt resuscitation" (DNAR) order. In western countries where individual's autonomy is well recognized patients are deeply involved in decision making process. Although this issue has been in the center of debate all over the world it has not been properly explored in East Europe so far. The objective of the survey was to examine an actual clinical practice and current opinions of the physicians about several aspects of CPR with special emphasis on process of making decisions.

METHODS. Two questionnaires were specially created for the study purposes. The first one examining current practice was filled in by physicians who diagnosed cardiac arrest. The questionnaire exploring opinions was filled in by a group of 168 physicians out of 200 drawn among 500 employed in Warsaw University Hospital.

RESULTS. Physicians on-call were main decision makers (45%) with no input from the patient when the decisions DNAR were made. Their knowledge about patients' medical condition was often scarce. DNAR decisions were usually informal and communicated to medical team only orally (98%). "Slow codes" are common in current clinical practice in Poland. Majority of examined physicians (63%) are not familiar with DNAR term. 20% of doctors declare that patients should be involved in the decision making process concerning CPR. More then 30% responders indicate the need for collegial elaboration of this extremely important decision. In opinion of 80% of doctors once such a decision is made it should be formally recorded. Sex, age and professional experience modify physicians' attitudes towards different aspects of resuscitation.

CONCLUSION. Results of the study confirm that attitudes of polish doctors concerning several aspects of resuscitation differ meaningfully from a model accepted in majority western European countries. Paternalistic and informal model of decision making still predominates, but many responders indicate that this approach should be changed. Current opinion of physicians differs strikingly from clinical practice in almost every respect.

0361

END-OF-LIFE (EOL) CARE: EVALUATION OF THE PRESENCE OF HOSPICE VOLUNTEERS BY FAMILIES AND PATIENTS

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INTRODUCTION. We introduced non professional hospice volunteers (NPHV) in our 15-bed medical tertiary care ICU in september 2003 with the aim to help conscious patients and family members to relieve the burden of an ICU stay. French laws and regulations recommend the presence of NPHV in palliative care settings. We performed a study to collect patients and family members' appreciation.

METHODS. We signed an official agreement with the association "ASP Iroise", a member of a national network of NPHV associations, defining NPHV' presence and role.
Four NPHV, women 40 to 65 yrs, took alternate turns in the ICU on Tuesday afternoons one week out of two from 09/2003 to 03/2004 and each week since 04/2004. NPHV were free to visit any conscious patient or family who wished so and the ICU staff asked the NPHV to visit people who seemed particularly distressed. NPHV wrote a brief commentary about their visits in a special logbook which can be read by the ICU staff.
All living patients and family members who met NPHVs were sent an anonymous questionnaire in 01/2005.

RESULTS. 1) NPHV were present 62 afternoons. The made 78 visits to 46 patients and 93 visits to 65 different families; contact was kept with 10 people after ICU discharge.
2) 82 questionnaires were sent. 4 patients answered, mean age 63 yrs; 19 family members answered, 10 spouses, 1 sister, 3 parents, 2 children, 1 close friend (no answer=2)
Answers to questions expressed / to patients (n=4) and family members (n=19)
* NPHV's hours of presence adequate: 2 - 12
* NPHV's presence is useful: 3 - 13
* NPHV
- helpful in case of loneliness: 1 - 6
- helpful in case of anxiety: 2 - 11
- bring appeasement: 2 - 6
- give moral support: 1 - 12
* Discussions with NPHVs are
- enriching: 2 - 10
- necessary or indispensable: 2 - 19
* Prolongation of NPHV presence wished: 3 - 17
* Access to NPHV wished for everybody: 3 - 19
* Wish to meet NPHV after ICU discharge: 2 - 6

CONCLUSION. Th presence of NPHV is considered useful by 3/4 patients and 2/3 family members. NPHV are helpful to alleviate loneliness and anxiety, to appease and give moral support to families. Prolongation of NPHV presence is wished by more than 80%. Wish for all patients and families to benefit from NPHV's presence is expressed by all answers.
NPHV's presence is an important element of our accompanying policy and should be reinforced.

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0362

FAMILLY INFORMATION BY BOOKLETS IN FRENCH ICUS

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INTRODUCTION. Little is known on the information delivered in ICUs by booklets. We surveyed the content of ICU information booklets in French ICUs.

METHODS. A sample of 105 ICUs, was enrolled. A questionnaire focusing on the modalities of patient family information, including the request to rate the Drs opinion on informing relatives on specific important issues was sent. Doctors (Drs) of ICUs were also asked to send their ICU information handout. This material was analyzed and we compared the percentage of information issues (items) found in these booklets and recommended by the two French ICU societies (1,2) and an American.(3) We quoted how often Drs deemed important some specific items should be explained to families.

RESULTS. 59 ICUs answered (56%). Numbers represent median percentage of response or median percentage of presence in booklets for the item considered. We found a significant difference ($p<0.01$) in booklet contents by type of ICU thus showing some "cultural" differences in information strategies. The amount of items recommended by reference documents (1-3) and found in booklets was low (41%), even if it was higher than the amount of items not recommended by reference texts present in booklets (6%)($p<0.01$). Considering the items we believed as important and which were submitted to the judgment of ICU Drs, we found that they were scarcely present in booklets (14%) despite they were rated as important and deserving to be incorporated in booklets (68%)($p<0.01$) Of note, some items were not mentioned in the three reference ICU societies but were present in a large percentage of booklets, e.g. modalities of children visits (63%), practical organisation of visits (23-44%), information to close relatives only (21%), role of, and response to the alarms (21%), possible need to physically restrain patients (13%), data describing the ICU architectural organisation (13-50%). The following items were marginally present in booklets despite often mentioned as needed by Drs: iatrogenic events (39% vs 2%), organ donation (51% vs 2%), inclusion in research studies (51% vs 6%), patient privacy (73% vs 21%), commitment to treat pain (76% vs 15%), how families manage stress (75% vs 13%).

CONCLUSION. There is a discrepancy between information recommended, observed and whished by Drs.

REFERENCE(S). 1. Informations aux proches. SFAR 2001; p.693-708 – 2. Groupe éthique SRLF. Réanimation 2001; 10: 571-81. – 3. ICU. JAMA patient page. JAMA 2002; 287:24.

0363

CHANGES IN FAMILY ATTITUDE TO TISSUE DONATION

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INTRODUCTION. to analyse changes in the attitude of relatives to tissue donation so as to modify interview strategies.

METHODS. A comparative, prospective and descriptive study of the interviews carried out betwen: 2001-2003 and 2004-2005 with all families of potential tissue donors (Ptd). An specific protocol was used:epidemiological data, interview data, perception of family attitude.

RESULTS. First period: 3400, evaluated 519 as Ptd with 42% refusals.
Second period: 3826 deceased, we evaluated as Ptd 947 with 33% refusals ($p=0.017$). We carried out 784 interviews and 1012. 6% knew something of Spanish transplant law and 2% carried a donor card or had made a living will. Percentages were similar in both periods. The interviewed relatives who refused donation were respectively (2001-03/ 2004-05):
parents 8-4%, partner 37-37, offspring 40-49, siblings 10-7 and other relatives 6-2(ns). Relating the cultural level of the relative with the refusals, we found that this was: low 20-26%, medium 62-46 and high 16-28(ns). The reasons for family refusals, in both periods, were as follows: deceased refusal whilst alive 33-22%, family opposition 23-25, problems with the health system 7-4($p=0.029$), problems with the corpse image 3-3, deceased's wishes unknown 12-12, religious problems 1-2, flat refusals 12-26. Others 19-6. Reasons justifying acceptance:wish to donate whilst alive 15-10%, refusal turn-around 11-2, post-information acceptance 70-60(ns)

CONCLUSION. There is still an important lack of awareness with regards the needs for tissue. Further work on diffusion and informing about donation and transplant is required. In the latter period, the high level of studies is not directly related to a higher level of donation. There were not significant changes in the attitude to tissue donation, deceased's will and simply familiar negatives are the most argued reasons. We felt people less prone to change their opinion because the transplant coordinator explanations.

REFERENCE(S). 1.- Martinez J M, Lopez J S, Martin A, et al.:Organ donation and family decision-making within the Spanish donation system Social Science & Medicine53(4):405-421 AUG 2001.
2.-Rodriguez J R, Cornell D L and Howard R J.:Organ Donation Decision: Comparison of Donor and Nondonor Families American Journal of Transplantation Vol.6 Pg 190 - January 2006.