Poster Session
Indicators of lung injury – 054-066

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EXCLUSION CAUSES OF PULMONARY DONATION: EXPERIENCE OF 7 YEARS

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INTRODUCTION. Pulmonary donation is the least frequent within multiorgan donation. We analyzed the causes for refusing the procurement of the lungs on our hospital, in an attempt to detect possible correctable factors.

METHODS. Prospective and descriptive study, including all the donors of our hospital, carried out from 1996 to 2002, both years included. We analyzed: demographic data of the donors, the causes of brain death and the causes of exclusion for lung procurement. Selection criteria for pulmonary donation were as follows: 1) Age < 55 years; 2) PaO2/FiO2 > 300 with FiO2 1 and PEEP 5 cm H2O; 3) normal chest-X-Ray; 4) absence of purulent secretions or any other abnormality evidenced by bronchoscopy; 5) normal intraoperative inspection of the graft.

RESULTS. We collected 101 donors along the study period. The mean age was 49±18 years (range: 16-78). The causes of brain-death were severe head injury (29 patients), subarachnoid haemorrhage (18), intraparenchymatous cerebral haemorrhage (36), ischemic stroke (13) and other causes (5). Pulmonary donation was contraindicated in 86 patients (85 %): 46/86 (53 %) by age criteria, 16 (19 %) due to pneumonia (early ventilator-associated pneumonia in 80 %), 8 (9 %) by pulmonary contusion secondary to severe thoracic trauma, 5 (6 %) by acute neurogenic pulmonary edema, 5 (6 %) by oxygenation criteria, 3 (3,5 %) due to underlying disease and 3 (3,5 %) by other reasons.
In 39% of the donors (39/101) some intrathoracic organ was procured and, among this group of donors, 12 % (5/39) donated the lungs, 26 % (10/39) heart and lung, and 62 % (24/39) only the heart graft.

CONCLUSION. Only in the 15 % of multiorgan donors the lung was procured to be implanted. After the age, pneumonia was the most important cause of exclusion for pulmonary donation. Maybe, strategies aimed at preventing early ventilator associated pneumonia could increase the yield of pulmonary donation.

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BRONCHOALVEOLAR LAVAGE FLUID PHOSPHATIDYLCHOLINE IN CHILDREN WITH ACUTE HYPOXIC RESPIRATORY FAILURE

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INTRODUCTION. We postulate that within respiratory failure there is a spectrum of disease from acute hypoxic respiratory failure (AHRF) to acute lung injury (ALI) and acute respiratory distress syndrome (ARDS). Current research suggests that changes in surfactant phosphatidylcholine (PC) composition are associated with the pathogenesis of acute lung injury (ALI) and correlate with disease progression. However, the PC profile from bronchoalveolar lavage fluid (BALF) of children with AHRF has yet to be examined.

METHODS. All children ventilated on PICU who developed AHRF (PaO2/FiO2 <40kPa) were recruited to the study, excluding patients with pre-existing lung injury or chronic ventilation. Following written informed parental consent, BALF samples and clinical information were collected on days 1-4, weekly and prior to extubation. BALF was filtered, centrifuged at 400xgx10 min at 4°C and extracted with chloroform/methanol. PC composition was determined by electrospray ionisation mass spectroscopy. Children intubated following minor surgical procedures acted as controls. Statistical analysis was performed using Mann-Whitney U tests. The Local Research Ethics Committee approved the study.

RESULTS. 32 children were admitted to PICU with respiratory failure, of whom 11 were recruited into the study. The proportion of Dipalmitylphosphatidylcholine (DPPC) in BALF was significantly reduced in AHRF patients (median=34%) compared to controls (median=43.4%; P=0.002). Reciprocal increases were seen for the unsaturated PC species palmitoyloleoyl PC (P=0.003)and palmitoyllinoleolyl PC (P=0.023), which are characteristic of inflammatory cell membrane fragments. These abnormalities tended to resolve with clinical improvement and resolution of respiratory failure.

CONCLUSION. The altered PC profile in AHRF was consistent with that seen in ALI. However, this was to a lesser degree (ALI median DPPC=19.8%). The increased unsaturated PC species are consistent with inflammatory cell membranes. Such alteration to surfacant phospholipid and the presence of inflammatory cells in AHRF may contribute to the pathogenesis of ALI.
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ROLE OF BRAIN NATRIURETIC PEPTIDE IN IDENTIFYING THE ORIGIN OF PULMONARY EDEMA IN CRITICAL PATIENTS

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INTRODUCTION. It is often difficult to establish the aetiology of severe respiratory insufficiency associated to pulmonary oedema. Haemodynamic profile obtained by pulmonary catheterization has been considered the "gold standard" in distinguishing pulmonary oedema of cardiac origin (with increased left ventricle filling pressures-LVFP) from that resulting of intrinsic pulmonary damage (acute respiratory distress syndrome), with normal LVFP. The role of brain natriuretic peptide (BNP) as a marker of increased LVFP in chronic conditions is well documented, but its potential value in critical patients with acute respiratory insufficiency and pulmonary oedema is still unexplored.

METHODS. We studied 20 patients with respiratory insufficiency and pulmonary oedema admitted to an intensive care unit. All were submitted to an evaluation of pulmonary capillary wedge pressure and, in the 3 subsequent hours, a peripheral blood sample was collected for BNP quantification using a rapid point-of-care immunofluorescence assay

RESULTS. The population was 60,6±14,9 years old and 11 patients were females. Ten patients had PCWP>=18mm Hg. Mean BNP values were 556±451 pg/ml (743 in patients with PCWP>=18mm Hg and 370 in those with PCWP<18mmHg, p=0,03). We found a positive correlation between BNP values and PCWP (r=0,56, p=0,01). The performance of BNP in identifying patients with PCWP<18, evaluated as the area under de ROC curve, was 0,78. The cut-off value of 250 pg/ml gave a negative predictive value of 100% and a positive predictive value of 71.4%.

CONCLUSION. These preliminary results suggest that "low" levels of BNP in critical patients with pulmonary oedema could identify non-increased PCWP, avoiding, in that subpopulation, the potential hazards of invasive haemodynamic monitoring.

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QUANTIFICATION OF RESPIRATORY ACID-BASE DISORDERS BY A RESPIRATORY BASE EXCESS

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INTRODUCTION. The physiochemical acid-base approach enables a detailed description and quantification of metabolic acid-base disorders by the standard base excess (SBE) and its subsets (1). The purpose of this study was to develop an analogous parameter to quantify respiratory disorders. This additional base excess subset we defined as the respiratory base excess (BEresp). Based on a modification of Watson´s formula (2), BEresp is calculated as the amount of acid/base which is necessary to restore pH to 7.4, in a certain respiratory derangement. The net effect of metabolic and respiratory disorders (BEnet) is calculated by the difference of BEresp and SBE (BEnet = BEresp – SBE). Therefore, patients with a normal BEnet (± 2 mmol/L) need to present a normal pH, and BEnet should directly correlate with pH.

METHODS. 13660 Arterial blood samples of critically ill patients of a medical intensive care unit were analysed using a standard blood gas analyser. SBE was calculated according to Siggaard-Andersen, BEresp by a modified Watson formula (see below). Correlation of BEnet and pH was calculated using Pearson´s correlation coefficient, and dependence of pH due to SBE and BEresp using linear regression.

RESULTS. BEnet correlated with pH at rs = 0.94. pH depends on SBE and BEresp, which can be quantified by the formula pH = 0.011 * SBE + 0.014 * BEresp + 7.40.

$$BE_{resp} = 1000 \left(\begin{array}{l} [H^+]_{normal} - \frac{K_w}{[H^+]_{normal}} - \frac{K_c \cdot pCO_2}{[H^+]_{normal}} - 2 \cdot \frac{K_c \cdot K_{a(H_2CO_3)} \cdot pCO_2}{[H^+]^2_{normal}} - \frac{[P]_{normal}}{1000} \cdot \\ \cdot \left(2 - \frac{[H^+]_{normal}}{K_{a(H_2PO_4^-)} + [H^+]_{normal}} \right) - \frac{alb_{normal} \cdot alb^-_{fix}}{alb_{ref}} + \frac{[H^+]_{normal} \cdot alb_{normal} \cdot alb_N}{(K_N + [H^+]_{normal}) \cdot alb_{ref}} \end{array} \right) + SID_{e_{normal}}$$

CONCLUSION. BEresp is a parameter which enables quantification of respiratory acid-base disorders, and since it uses the same unit (mmol/L) as the metabolic parameters, it allows direct comparison of metabolic and respiratory derangements. Based on SBE and BEresp compensational mechanisms are easily analysed.

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EFFECTS OF TIDAL VOLUME ON LUNG INJURY IN VENTILATED RATS AFTER INTRAVENOUS ENDOTOXIN ADMINISTRATION

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INTRODUCTION. The interactions between injurious ventilation strategies and endotoxin administered prior to mechanical ventilation are not well known. Accordingly we investigated the effects of increasing tidal volumes on inflammation markers and oxygenation after systemic endotoxin administration in an in vivo animal model.

METHODS. Male Wistar rats (350-380g) received an intravenous injection of endotoxin (1mg LPS, E.coli O55:B5, 1ml)or phosphate buffered saline (PBS, 1ml = placebo). Twenty four hours after treatment the rats were anesthetized and intravascular catheters inserted for fluid infusion and haemodynamic monitoring. A tracheostomy was performed and mechanical ventilation was started (FiO2 = 0.4, 40 breaths/minute). Tidal volume (TV) was randomly adjusted at 9, 27 or 30 ml/kg body weight and kept constant throughout the ventilation period. Each group consisted of 8-10 rats. Oxygenation was measured every 30 minutes and after 4 hours of mechanical ventilation lung lavage was performed for assessment of neutrophil count and protein content. An ANOVA was used for statistical analysis. P<0.05 was considered as significant, values are given as mean and SEM.

RESULTS. Lung lavage neutrophil count (cells/ml) at all TV levels was significantly higher in LPS groups (501±162, 733±193, 287±60 at TV 9,27,30ml/kg, respectively) than in PBS groups (99±33, 99±50, 41±13 at TV 9, 27, 30ml/kg, respectively). With increasing tidal volumes lung lavage protein content (mg/l) significantly increased, and was significantly higher in LPS groups compared to PBS groups (LPS: 117±8, 620±175, 2101±455 and PBS: 112±9, 278±65, 663±246 at 9, 27, 30 ml/kg, respectively). TV of 9 and 27ml/kg did not affect oxygenation after LPS or PBS treatment. TV of 30ml/kg significantly lowered oxygenation after LPS treatment (PaO2: 227±5 vs 160±14 at 0.5h vs 3.5h, respectively), but not after PBS treatment (PaO2: 238±3 vs 224±13 at 0.5 vs 3.5h, respectively).

CONCLUSION. Ventilation with high tidal volume 24 hours after a single intravenous dose of LPS, compared to ventilation after placebo administration, increased pulmonary inflammation markers and worsened oxygenation in this animal model.

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BRAIN DEATH AS A PRIME FOR VENTILATOR INDUCED LUNG INJURY IN AN ISOLATED RABBIT LUNG MODEL

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INTRODUCTION. Early lung dysfunction observed after lung transplantation is characterized by alveolar damage and lung oedema. Factors involved in this process are unclear. These findings are similar to those observed in ventilator induced lung injury (VILI). As both, lung donors and recipients, are submitted to mechanical ventilation, our hypothesis was that brain death (BD) is a preconditioning factor to develop VILI.

METHODS. Twenty-four rabbits were randomized to control (CRL) or induced BD groups (increasing intracraneal pressure above systolic pressure) and were ventilated in volume controlled mode (tidal volume 10 ml/kg, positive end expiratory pressure (PEEP) 0 cmH2O and respiratory rate (RR) to obtain normocapnia) for 120 minutes. Isolated lungs were perfused with 300 ml/min (constant flow) and submitted to an injurious ventilation in pressure controlled mode (peak pressure 30 cmH2O, PEEP 5 cmH2O and RR 20) for 30 minutes. Pulmonary oedema and lung injury were assessed by weight gain, change in ultrafiltration coefficient (DKf) and a histologic haemorrhagic score. Data are expressed as mean and 95% confidence interval and were compared with t test.

RESULTS. Gas exchange and mechanics for the two groups did not differ along the two hours after randomization.

	CRL	BD	*p*
Weight gain (g)	0.43 (0.20 - 0.65)	0.92 (0.52 - 1.32)	0.029
Histologic Score (0 - 15)	5.4 (3.37 - 7.42)	8.80 (6.15 - 11.45)	0.035
DeltaKf ($g \times mmHg^{-1} \times min^{-1}$)	0.027 (0.007 - 0.047)	0.07 (0.033 - 0.11)	0.037

CONCLUSION. Under these experimental conditions BD contributes to pulmonary oedema formation and lung haemorrhage. Brain death acts as priming for VILI development.
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NEUTROPHIL ELASTASE IN BRONCHOALVEOLAR LAVAGE OF CHILDREN WITH ACUTE HYPOXIC RESPIRATORY FAILURE

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INTRODUCTION. Acute respiratory failure is a common cause of admission to Paediatric intensive care units (PICU). Little is known about the progression to acute lung injury. Evidence suggests that the severity of lung injury, measured by oxygenation defects, correlates with the extent of neutrophil influx and release of neutrophil elastase (NE) into the alveolar spaces. Increased levels of NE has been implicated in the degradation of surfactant phospholipids, which may play a central role in the pathophysiology of ALI and ARDS. These alterations have yet to be investigated in acute hypoxic respiratory failure (AHRF), that may precede ALI.

METHODS. All children requiring mechanical ventilation admitted to PICU who developed AHRF (defined as PaO2/FiO2<40kPa, without bilateral pulmonary infiltrates on chest X-Ray) were eligible for the study. Patients were excluded due to pre-existing lung injury or chronic ventilation. Following written informed parental consent, bronchoalveolar lavage (BAL) samples were collected on days 1-4, weekly and prior to extubation. Samples were centrifuged at 400 x g at 4°C for 10 minutes. Cell pellets were used for differential cell counts and the supernatant was stored at -80°C until further analysis. Total NE concentrations were determined from aliquots of BAL using a commercial ELISA Kit. Children intubated following minor surgery acted as controls. Statistical evaluation was made by Mann-Whitney U test and Spearman's Rank Correlations.

RESULTS. 32 children were eligible during the 18-week study period and 11 were recruited. Concentrations of NE in AHRF patients (median = 8918ng/ml; range =130-57419ng/ml) were significantly higher than in those of control samples (median =219.8ng/ml; range =16-1177ng/ml; P=0.0038). There was a positive correlation between NE concentrations and the proportion of neutrophils as determined by cytology (r =0.356; P=0.049) in children with AHRF. There was a non significant negative correlation between both NE (P=0.462) and proportions of neutrophils (P=0.460) and PaO2/FiO2 ratios.

CONCLUSION. Elevations in proportions of neutrophils and NE concentrations in BAL suggest that neutrophil activation and degranulation occurs in AHRF in children prior to the development of ALI. We speculate that this may play an important role in the early pathogenesis of acute lung injury.

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COMPARISON OF SMALL VERSUS NORMAL TIDAL VOLUMES IN INDUCING INJURY IN NORMAL LUNGS

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INTRODUCTION. Experimental and clinical data support that small tidal volumes are associated with reduced injury when the lungs are acutely injured. However, ventilation induced injury in normal lungs are not well studied. Experimentally, there is some evidence that ventilation can also damage normal lungs.

METHODS. Design: Prospective, randomized clinical trial. Setting: 19-bed general ICU of a university hospital. Patients: 11 patients without acute or chronic lung disease that had a medical indication to be ventilated for at least 12 hours after admission. Exclusion criteria were any acute lung disease, COPD or structural lung disease. Objective: To compare the effects of small (6ml/kg) vs. normal (12 ml/kg) tidal volume in inducing lung injury. Interventions: Patients were randomly assigned to ventilate with a tidal volume of 6 ml/kg (n=6) and 12 ml/kg (n=5) during 12 hours with no PEEP. Measurements: Blood samples for TNF alpha and IL-8 were taken before the procedure and 12 hours later. Simultaneously, a bronchoalveolar lavage (BAL) was also performed to obtained TNF alpha and IL-8 from the lungs.

RESULTS. The preliminary results showed there was not difference in APACHE II or any demographic data before the procedure. The mean plateau pressure (34±10 vs. 17±3 mmHg) and tidal volume (830±219 vs. 542±111 ml) were grater for patients ventilated with 12 ml/kg then with 6 ml/kg. TNF was detected in the blood of only two patients but not in the BAL. IL-8 blood median concentrations were not different for patients with 12 ml/kg compared with 6ml/kg tidal volume at admission (44[14-490] vs. 66[31-189] pg/ml) and after 12 hours (13[0-64] vs. 40[21-191] pg/ml). The median IL-8 values in the BAL were similar at admission (62[21-1251] vs. 62[49-284] pg/ml) but greater after 12 hours (338[132-1647] vs. 72[51-547] pg/ml, p=NS) in the 12 ml/kg group when compared to the 6 ml/kg group.

CONCLUSION. The preliminary results of this trial may suggest that normal lungs may be protected by a small tidal volume.
Grant acknowledgement: CAPES

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THE EFFECTS OF AIRWAY PRESSURE AND INSPIRATORY TIME ON BACTERIAL TRANSLOCATION

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INTRODUCTION. High peak pressures can cause lung injury as evidenced by translocation of intratracheally inoculated bacteria. The aim of this study was to determine the effects of inspiratory time on bacterial translocation during mechanical ventilation with or without PEEP.

METHODS. 36 Sprague Dawley rats were anesthetized and tracheostomized and ventilated with 14 cmH2O peak inspiratory pressure (PIP), 0 cmH2O PEEP, FiO2 1.0, 30 breaths/min, I/E:1/2 in pressure controlled ventilation mode. Carotid artery was cannulated to obtain blood samples for blood cultures and blood gas analysis and arterial pressure monitoring during the experiment. Baseline blood samples were obtained for blood gas analysis and blood culture. After inoculation of 0.5 mlx5 power of 10 cfu/ml Pseudomonas aeruginosa into the trachea, the rats were randomized to 6 groups: LP 1/2 14cmH2O PIP, 0 cmH2O PEEP, I/E:1/2, LP 2/1 14 cmH2O PIP, 0 cmH2O PEEP, I/E:2/1, HP 1/2 30 cmH2O PIP, 0 cmH2O PEEP, I/E:1/2, HP 2/1 30 cmH2O PIP, 0 cmH2O PEEP, I/E:2/1, HPP 1/2 30 cmH2O PIP, 10 cmH2O PEEP, I/E:1/2, HPP 2/1 30 cmH2O PIP, 10 cmH2O PEEP, I/E:2/1. The other ventilatory settings kept at the baseline values, blood cultures were obtained every 30 minutes during the experiment (2 hours). Blood samples were cultured directly in blood sheep and MacConkey agar and observed on the second day.

RESULTS. As compared to baseline values PaO2 decreased in LP 1/2, LP 2/1, HP 1/2, HP 2/1(273±70 to 123±13, 373±46 to 278±8, 353±187 to 94.4±36.3, 350±111 to 237.5±208, respectively) but significant differences were observed in LP 1/2, LP 2/1, HP 1/2. Bacterial translocation were found 0 in LP 1/2, 0 in LP 2/1, 3 in HP 1/2, 4 in HP 2/1, 1 in HPP 1/2, in HPP 2/1. The comparison of translocation rates for HPP 1/2 to HPP 2/1 was statistically significant. Although less positive blood cultures were found in HP 1/2 and HP 2/1, this finding was not statistically significant when compared to HPP 2/1.

CONCLUSION. High PIP and combining high PIP with prolonged inspiratory time increases the likelihood of bacterial translocation. However PEEP is preventive of bacterial translocation in only high PIP group.

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TEZOSENTAN COUNTERACTS ENDOTOXIN-INDUCED PULMONARY OEDEMA AND IMPROVES GAS EXCHANGE.

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INTRODUCTION. Plasma levels of endothelin-1 are increased during sepsis where it is thought to have pro-inflammatory properties. The pathophysiology of sepsis-induced acute lung injury is complex, and involves increased extra-vascular lung water and deteriorated gas exchange. This study aimed to test the effects of the novel dual endothelin receptor antagonist tezosentan in limiting the increase in extra-vascular lung water and decrements in lung function during endotoxaemia.

METHODS. Extra-vascular lung water was measured gravimetrically in twelve anaesthetised pigs after five hours of endotoxaemia. After two hours of endotoxaemia, six of the animals received a bolus of tezosentan 1 mg_kg^{-1} followed by a continuous infusion at a rate of 1 mg*kg^{-1}*h^{-1}. Conventional pulmonary and haemodynamic parameters were measured. Extra-vascular lung water was also determined in four additional pigs not exposed to endotoxin. Differences in EVLW was calculated by student's T-test for independent values, all other differences between groups were calculated with a ANOVA for repeated measurements from the point of intervention to the end of the protocol.

RESULTS. Tezosentan counteracted the deterioration of lung function caused by endotoxin, as measured by dead space (54 vs 36 % p 0,03), venous admixture (43 vs 16 % p 0,013) and compliance index (0,47 vs 0,75 ml*cmH_2O*kg p 0,014). In addition, pulmonary hypertension was attenuated (40 vs 30 mmHg p < 0,001). Tezosentan had a marked effect on the endotoxin-induced increase in extra-vascular lung water (14,1 vs 7,7 ml/kg p < 0,0019) that was reduced to levels observed in sham animals (6,3 ml/kg).

CONCLUSION. These results suggest that endothelin-1 is involved in the development of sepsis-related pulmonary oedema, and that endothelin receptor antagonism may be of value in the treatment of acute lung injury.
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USE OF THE SIMPLIFIED DESATURATION INDEX TO IDENTIFY LUNG DYSFUNCTION

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INTRODUCTION. The purpose of this study was to correlate the Simplified Desaturation Index(SDI) with: The Desaturation Index(DI) (1,2),conventional indices of gas exchange, and thorax x-ray infiltrates(Tx-r).

METHODS. Patients under mechanical ventilation with and without ARDS were included. In order to obtain an equation to calculate the SDI, we performed a regression multiple analysis; PEEP, FiO_2 and pulse oximetry (SpO_2) were included as coefficients. Then, we used our previous procedure(2)to determine a standard DI, and four groups of lung function were identified from normal to severe lung dysfunction(2). Conventional indices of lung function were calculated, and Tx-r was observed. Correlation analysis and a cross-table were performed.

RESULTS. We included 31 mechanically ventilated patients from a general ICU in which 103 SDI and DI were performed. There was a strong correlation on the regression multiple analysis by using PEEP, FiO_2 and SpO_2 to predict the DI (r .919). There was a strong correlation between the SDI and the DI (r.846). Additionally, there was a moderate correlation between the SDI and the $P(A\text{-}a)O_2$ index (r.785); moderate negative correlation between both; the SDI with the PaO_2/FiO_2 index (r-.683) and the SDI with the $PaO_2/P(A\text{-}a)O_2$ index (r-.523). In group I(healthy lungs) 75% of patients had not lung infiltrates, and in group IV (ARDS) 80% of patients had three and four quadrants with infiltrates on Tx-r.

CONCLUSION. It is possible to determine lung function and dysfunction by using the SDI during mechanical ventilation.

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Grant acknowledgement: Consejo Nacional de Ciencia y Tecnología, México

065

IATROGENIC PNEUMOTHORAX (IP) IN INTENSIVE CARE UNIT (ICU) PATIENTS

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INTRODUCTION. IP are one of the 4 major iatrogenic complications which occur in ICU

METHODS. During a prospective observational study performed in 6 ICUs, 1673 patients hospitalized more than 48 hours in the OUTCOME REA data base. The occurrence of IP were collected among 62 daily variables.

RESULTS. Fifty-two patients developed IP (3.1%), including: (A) under mechanical ventilation alone (n=23); (B) after thoracenthesis (n=16); (C) after central vein catheterization (n=9); (D) post operative (n=4). The median time of occurrence of IP was 7.5 d [2-18d]. All of them required a chest tube placement for a median duration of 5.5 d [3-9d]. The occurrence of a IP increased significantly the ICU and hospital length of stay and increased the ICU and Hospital mortality. In a Cox model with an adjustment on the time of occurrence of IP, severity on admission, underlying chronic disease and age, IP did not increase the risk of death (RR: 1.11 [0.72-1.69], p=0.63).
*ICH: Immunocompromised host - **MR: mortality rate

	Controls (n=1621)	IP (n=52)	P value	A (n=23)	B (n=16)	C (n=9)	D (n=4)
chronic diseases	52%	53%	NS	30%	50%	66%	75%
ICU stay	6d	17.5d	0.0001				
Hospital stay	21d	37.5d	0.0023				
ICU MR*	22%	38%	0.01	52%	18%	33%	50%
Hospital MR	30.6%	52%	0.002				

**MR: mortality rate*

CONCLUSION. IP are iatrogenic events associated to a longer hospital stay, mainly preventable because due to procedures. They could be evaluated as quality care markers in ICU.

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TEMPORAL OXYGENATION DERANGEMENTS IN ARDS

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INTRODUCTION. The level of oxygenation compromise and lung injury are close implicated with outcome in ARDS.

METHODS. Objectives: To compare the level of oxygenation derangement and lung injury with survival.
All patients who met ARDS criteria according the American-European Consensus Conference, admitted to the ICU between January 1999 and December 2002 were included in the study. The following data were prospectively collected during the first week: age, gender, PaO_2/FiO_2, Lung Injury Score (LIS),deltaPaO_2/FiO_2 (higher minus admission PaO_2/FiO_2) and mortality. Statistical analysis was done with *t* test,Chi^2 and Mann-Whitney as indicated, with a p value < 0.05 considered statistically significant.

RESULTS. In the study period 110 patients met ARDS criteria. Mean age was 46.7 yrs (15-89 yrs) and mean APACHE II score was 20.7 (7-48). The PaO_2/FiO_2 and LIS are in the table below. The mean deltaPaO_2/FiO_2 was 170±106 and 69±79 mmHg (p=0.0001) in survivors and non-survivors, respectively.

Day	**Survivors n=33 (30%)**		**Non-survivors n=77 (70%)**	
	PaO2/FiO2	LIS	PaO2/FiO2	LIS
1	128±35*	3.2±0.39°	107±42	3.3±0.47
2	201±74**	2.9±0.48*	125±63	3.2±0.57
3	201±81**	2.7±0.67***	137±76	3.1±0.52
4	219±94**	2.5±0.66***	145±71	3.0±0.58
5	239±99**	2.4±0.68**	145±60	3.0±0.57
6	231±108***	2.3±0.89**	158±61	2.8±0.58
7	204±78*	2.3±0.74*	167±63	2.7±0.77

** p<0.05; ** p<0.0001;***p<0.001;° NS*

CONCLUSION. Survival in ARDS is associated with a prompt restoration in oxygenation and less degree of lung injury. Patients who will not survive presented a temporal pattern in the first week associated with persistent hypoxemia and lung injury.

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INFLUENCE OF THE GAS DRIVING JET-NEBULIZER ON FIO2 IN AN IN-VITRO MODEL OF SPONTANEOUS VENTILATION

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INTRODUCTION. Jet nebulizors are widely used to administrate bronchodilatator agents. O_2 and air are recommended as driving gas in asthmatic and COPD patients, respectively. However, little is known about the influence of the gas on the FiO_2. Our aim was to compare different modes of administering O2 (with or without concomitant nebulization) and different ventilatory patterns, in an in vitro model, with the FiO_2 result.

METHODS. The distal extremity of the trachea of a cadaver head and neck formolin-conserved specimen was intubated. Ventilation was performed by a Harvard pump running air. Different ventilatory patterns were tested: RR 10-20-30-40/min; Vt 300-500-750mL; I/E 1/1-1/2-1/3. O_2 was administered by a nasal catheter (Ncat), nasal cannula (Ncan), simple mask, non rebreathing mask and aerosol mask (AMO_2). Air-driven nebulized saline aerosol (AMair) was secondary associated to Ncat or Ncan O_2 administration. Increasing O_2-flow were tested. FiO_2 was measured by an electro-chemical analyzer (Maxtec, Airox BioMS,Utah) placed on the pump circuit. All measurements were triplicate. Statistical analysis used MANOVA and canonical analysis.

RESULTS. FiO_2 was significantly influenced by the mode of O_2 administration (F=66.4-p=0.001). The highest FiO_2 was obtained with Ncat+AMair whatever O_2 flow. For 12 and 15L/min, Ncan+AMair was as efficient as Ncat+AMair. FiO_2 was significantly lower with AMO_2 (figure not showned). Whatever the mode of O_2 administration, FiO_2 decreased significantly with increasing RR (F=225-p<0.001) and Vt (F=367-p<0.001).

CONCLUSION. Ncat or Ncan O_2 administration associated with an air-driven nebulized aerosol (AMair) increase significantly FiO_2, whereas AM02 dramatically decrease FiO2 for O2 flow>6L/min.

Poster Session
Spontaneous ventilation and weaning – 067-080

067

INNOVATIONS IN MECHANICAL VENTILATORY SUPPORT

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INTRODUCTION. The work of breathing (WOB) during the inspiratory phase can be split in patient-work and respirator-work depending on the assisted ventilation modality used. The aim of this study was to evaluate new assist-modality, Volume support (SIEMENS SERVOi), applied after controlled ventilation. Volume support is a dual control breath-to-breath pressure support mode that uses Vt as a feedback control for continuously adjusting the pressure support level.

METHODS. In 8-month period, 20 patients with septic shock, traumatic injury and acute respiratory failure were studied. In the first 9 patients we compared inspiratory pressure, rr, Vt, $PtCO_2$, PaO_2.We observed a significant difference between inspiratory pressure in Pressure support and Volume support, so we decided to continue the study with oesophageal catheter (BICORECP100) to realise also the work of breathing. During the observation we recognized mechanical respiratory data, PaO_2 e $PtCO_2$.The carbon dioxide was detected with transcutaneous system: TOSCA.

RESULTS. The data analysed with the non-parametric Wilcoxon's test show: the mean of the inspitatory pressure during PSV was of 19,56±6,7 cmH2O,while, during Volume support, the inspiratory pressure was significantly lower (16±5,5cmH_2O, P<0.001).The mean of WOB during PSV was of 0,5±0,3J/l while in Volume support 0,45 ± 0,3 J/l (P=0,6 not significant).

CONCLUSION. In conclusion, Volume support seems to be a good new method of assist ventilation, but is inadequate in the patients with airflow obstruction, because the pressure level increase to maintain the Vt, could generate iPEEP. Another important condition during volume support is the PaCo2 monitoring to avoid excessive Vt, excessive work of breathing and inspiratory pressure and weaning may not progress.

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Grant acknowledgement: ESICM member

069

CARDIORESPIRATORY EFFECTS OF INCREASED RESPIRATORY VARIABILITY

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INTRODUCTION. Proportional Assist Ventilation (PAV) alone or in combination with Automatic Tube Compensation (ATC) delivers in contrast to Pressure Support Ventilation (PSV) a variable degree of inspiratory pressure support. This in proportion to the patient's efforts delivered pressure can lead to a higher variability in tidal volumes (VT) (1) which might alter the cardiorespiratory function. Experimental studies observed both improved oxygenation and cardiac output with higher VT variability (2). Our hypothesis was that in patients recovering from acute lung injury different forms of delivery of pressure support will not affect cardiorespiratory function if inspiratory assistance is properly matched.

METHODS. 10 patients were ventilated with PSV, PAV or a combination of PAV with ATC (Evita 4, Draeger) in random order. PEEP was kept constant and pressure support was adjusted in a way that mean inspiratory pressure was comparable. Spirometric variables were obtained using pneumotachography, and end expiratory lung volume (EELV) was determined by N2 washout (3).

RESULTS. See table (Values are means ± sd. RR: respiratory rate, CV: coefficient of variation, CI: cardiac index, *: p<0.05 vs PSV (one-way ANOVA with LSD post-hoc test))

	PSV	**PAV**	**PAV + ATC**
RR [1/min]	17.8 ± 6.1	17.1 ± 6.2	17.5 ± 7.0
VT [ml]	637 ± 175	665 ± 209	687 ± 257
CV (VT) [%]	6.8 ± 3.6	8.5 ± 5.2 *	12.4 ± 7.3 *
CI [l/min/m^2]	4.2 ± 0.9	4.3 ± 1.1	4.3 ± 1.0
PaO2/FiO2	342 ± 68	362 ± 111	352 ± 76
EELV [l]	2.70 ± 1.09	2.72 ± 1.10	2.79 ± 1.25

CONCLUSION. A higher VT variability due to dynamic pressure support does not influence cardiorespiratory variables in our patients as long as the level of pressure support is matched.

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070

A COMPARISON OF SEVEN PREDICTIVE PARAMETERS FOR WEANING USING A NEW INTEGRATIVE WEANING INDEX

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INTRODUCTION. The majority of the predictors of the weaning outcome are frequently inaccurate. With the present study, we aim to evaluate a new index to predict the weaning outcome, that we call integrative weaning index (IWI)

METHODS. Two hundred and fifty patients of several aetiologies in weaning process, that remained up to 24 hours in mechanical ventilation were evaluated(all with PaO2>60mmHg with FiO_2 < 0.4 and PEEP<8cmH_2O).All patients were submitted of a two-hour trials of spontaneous breathing. Those who sustained two-hour of spontaneous breathing without return to mechanical ventilation in the following 24 hours were considered weaning, while those who could not sustain two-hour of spontaneous breathing or returned to mechanical ventilation in the following 24 hours were considered not weaning. Frequency/tidal volume ratio(f/Vt ratio),Airway occlusion pressure 0.1s after the onset of inspiratory effort(P 0.1), the product of P0.1 and f/Vt(P 0.1 x f/Vt), respiratory rate (RR),Quasi-static compliance of the respiratory system(Cqst,rs), PaO_2/FiO_2 ratio and the new integrative weaning index (IWI=Cqst,rsSaO_2/f/Vt ratio) were evaluated in all patients. Arterial blood gas was collected with FiO_2 in 0.35. Sensitivity, specificity, positive predictive value, negative predictive value and the receiver operating characteristic (ROC)curves were calculated in order to evaluate the performance of each index

RESULTS. Two hundred and eighteen patients were weaned, while thirty two were not weaned. The IWI presented the larger area under the ROC curve(0.97),followed by the f/Vt ratio(0.90), Cqst,rs(0.89),f/Vt x P0.1 (0.85),RR(0.80),P 0.1(0.70) and finally by the PaO_2/FiO_2 ratio(0.60)

CONCLUSION. In our study, even compared to other essential indexes of the literature, the IWI showed to be the best criteria to predict the weaning outcome. With the obtained results, we believe that with the use of the IWI in other countries, we may prove more and more its accuracy

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NONINVASIVE MASK VENTILATION IN ACUTE LUNG INJURY SYNDROME AFTER OPEN HEART SURGERY.

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INTRODUCTION. One of the serious complications in the patients operated with cardiopulmonary bypass is acute lung injury, especially in association with MOSF. On the initial stages of ALI the prognoses is indefinite and patients are usually treated with mechanical ventilation through endotracheal tube. There are several publications about non-invasive positive mask ventilation (NIMV) in this category of the patients [1]. Because a significant part of patients have good response to the complex treatment of ALI and MOSF, the goal of the study was to access the possibility of NIMV application to reduce complications associated with the presence of endotracheal tube.

METHODS. 48 patients with ALI and MOSF after cardiovascular surgery in the early postoperative period were studied. The causes of MOSF were cardiogenic shock in 44%, massive blood loss in 33%, anaphylactic reactions in 15% of the patients and postperfusion lung in 8%. In 18 patients extracoproreal detoxication procedures were performed and IABC was used in three cases. For the assessment of MOSF the Marshall score was used. NIMV was provided with Respironics face masks using BiPAP Std and BiPAP Vision ventilators with assisted modes of ventilation.

RESULTS. The results of the study are presented in the table. The patients divided into two groups – 28 (58%) with positive (group A) and 20 (42%) with negative (group B) response to NIMV. There were no differences in PaO_2/FiO_2 and Marshall score index in the beginning of NIMV between the groups compared. In group A the mean duration of NIMV was 40 ± 5 hours. To this moment PaO_2/FiO_2 increased on 63% (p<0.05), and Marshall score index decreased on 30% (p<0.05). All the patients survived. In group B there was progressive decrease in PaO_2/FiO_2 and increase of MOSF severity index. All of them were intubated and mechanically ventilated with CMV mode. The mortality rate in this group was 35%.

CONCLUSION. Postoperative ALI in cardiovascular patients can be successfully treated with NIMV and assisted ventilation in 58% cases. Progressing of MOSF and deterioration of respiratory function are the indications for immediate tracheal intubation and controlled mechanical ventilation

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072

EFFECT OF A MECHANICAL VENTILATOR WEANING PROTOCOL ON RESPIRATORY OUTCOMES – A CASE-CONTROL STUDY.

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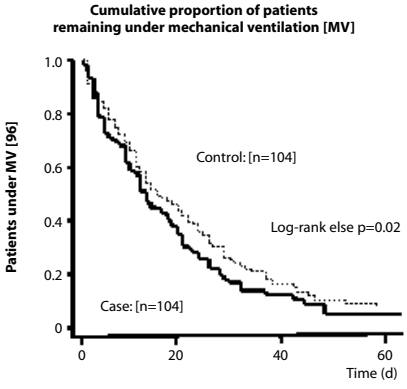
INTRODUCTION. The aim of this study was to evaluate whether a systematic mechanical ventilator weaning protocol may reduce ventilation duration and ICU length of stay.

METHODS. a prospective matched case controlled study, in a medical ICU; 104 patients (cases), who were ventilated >48h, from 03-2002 to 02-2003, were compared with 104 "historical" patients (controls), matched on age, SAPSII and diagnosis.

RESULTS. Overall matching was successful for all included patients. Mean ventilation duration (16,6±12,9 vs 22,5±21 days; p= 0.02), mean ICU length of stay (15,3±11,9 vs 23±22,6 days; p= 0,02) were significantly lower among cases patients.



CONCLUSION. This study confirms that a mechanical ventilator weaning protocol is associated with a shorter duration of ventilation and ICU length of stay.

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CHARACTERISTICS AND OUTCOME OF PATIENTS REQUIRING INVASIVE MECHANICAL VENTILATION

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INTRODUCTION. Mechanical ventilation (MV) is one of the most usual procedures performed in the ICU. Objective: To assess the characteristics and outcome of patients requiring invasive MV. To determine the impact of infection and others variables associated with mortality.

METHODS. Prospective multicenter cohort study carried out in 17 ICUs during 12 months to investigate VAP´s risk factors. All patients ventilated >12 hours were included. Statistical analysis: Chi square test.

RESULTS. There were 1704 patients, mean age 57.3 (18.1) years, male sex 66.5%, APACHE II at admission 18.2 (7.6), diagnostic category (%): medical 57, scheduled surgery 14.9, emergency surgery 15, trauma 12.9; ICU LOS 16.5 (1.6) days; days in MV/days in ICU ratio 0.65. The patients developed complications (%): respiratory 36,6, shock 34,7, renal 28,2, neurological 27,7, cardiac 20.3, ARDS 17.6, hepatic 13.1, gastrointestinal 11.9, digestive bleeding 6.1 and barotrauma 3.8. In 353 patients, 403 episodes of pneumonia (VAP) were developed. 651 patients (38.2%) died, 89.5% in the ICU and 10.5% in wards. The cause of death was (%): MODS 49, shock 20.4, brain death 19.6 and hypoxemia 10.8. The variables associated with death were: age 62/54.4 years (p<.0001), APACHE II 21.8/17.7 (p<.0001) GCS 10.6/11.5 (p=.0005), (%) underlying condition: medical 44.9, scheduled surgery 24,6 emergency surgery 40,7 and trauma 21,1 (p<.001), COPD 44.8/36.8 (p=.008), chronic renal failure 54.4/37.6 (p=.002), malignancy 44.5/37.2 (p=.02), neutropenia 81.5/37.6 (p<.001), chemotherapy 55.9/38 (p=.03), inmunodeficiency 74,2/37.6 (p<.001), malnutrition 50/36.5 (p=.002), cardio-respiratory arrest 54.7/36.4 (p<.001), ARDS 56/35.8 (p<.0001), blood transfusion 42/36.4 (p=.002), sepsis 47.3/30.7 (p<.0001), shock 54.4/32.8 (p<.0001), previous pneumonia 48.3/37 (p=.001), previous infection 48.3/37 (p=.0001) and VAP 46.5/36.2 (p=.004).

CONCLUSION. Patients requiring invasive MV had a long ICU stay and a high mortality rate. The main cause of deaths was MODS. Underlying condition and development of infectious events an other complications, significantly influence outcome

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074

USE OF NONINVASIVE MECHANICAL VENTILATION IN PATIENTS WITH ACUTE RESPIRATORY FAILURE

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INTRODUCTION. Objective: To evaluate our clinical experience with the use of non-invasive mechanical ventilation (NIMV) in patients with acute respiratory failure (ARF).

METHODS. Design: Three-year period retrospective observational study. Setting: General intensive care department (ICU) of a University Hospital. Patients: From 1999 to 2002, we documented clinical data, gas exchange and outcome of every patient admitted to ICU with ARF and received NIMV as first line treatment to support the respiratory system. Interventions: NIMV was applied in patients with ARF meeting certain criteria. When patients failed to improve with NIMV, standard mechanical ventilation with endotracheal intubation (ETI) was initiated.

RESULTS. One hundred and one patients (mean age 61±20 yrs, 72 males, 29 females) received NIMV for a mean of 22±27 hours. Acute lung injury/acute respiratory distress syndrome (ALI/ARDS) was the cause of ARF in 53 patients, congestive heart failure (CHF) in 24, COPD exacerbation in 20 and other causes in 4. Twenty eight patients (28.9%) needed ETI (36% with ALI/ARDS, 12.5% with CHF, 30% with COPD) after 17±17.5 hours of NIMV. Overall ICU mortality was 10%, exclusively due to the group that failed NIMV (36.7% mortality in this group). We compared data at baseline and 1 h after the onset of ventilatory support and found that in the failure group the improvement in blood gasses was significantly less.

CONCLUSION. NIMV is highly effective in selected patients with ARF during routine use in a university hospital.

075

EVALUATION OF A MULTIDISCIPLINARY WEANING PROTOCOLE IN ICU

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INTRODUCTION. Premature or delayed extubation exposed patients to useless risks of nosocomial pneumonia, increased equipment cost and length of stay in the intensive care unit. Consequently, the aim of our study was to evaluate a mechanical ventilator weaning protocol driven by physicians, therapists and nurses in order to shorten the weaning period.

METHODS. This prospective study include patients requiring intubation and ventilation for acute respiratory failure, for at least 48 hours. The weaning protocol presents two-step : a first evaluation of 11 criteria (including FR/VT < 100, SpO2 > 92 %) evaluated after 10 min of pressure-support ventilation (PSV 12 cmH2O or less, PEEP < 5 cmH2O and FiO2 < 0.4) so called well-performing series. All patients filling successfully these criteria, underwent a 1 hour T-tube trial. Failure criteria were clinical: agitation, ventilatory muscle fatigue, RR > 30/min, SpO2 < 92 %, HR +20 %, systolic blood pressure +20 mmHg. If the trial failed, mechanical ventilation was reinstituted and the weaning protocol was repeated once-daily. If the trial was successful, the physicians allowed extubation. Our assessment criteria was adjustment between the ventilatory status of the patient (extubated or not) and the result of our weaning trial (success or failure) within 48 hours.

RESULTS. 95 patients were included (35W, 60M). The mean age was 55 years (± 19), the mean ventilatory duration 7.7 days. Underlying conditions were medical (42 %), surgical (32 %), traumatic (26 %). All patients, candidate for the T-tube test, presented the well-performing criteria. The T-tube test (mean duration: 37 min ± 14) was successful in 70 % of cases. Only 10 % patients underwent reintubation within the 2 following days. So the predictive positive value was 90 %. 10 % of the patients received non invasive ventilation after extubation.

CONCLUSION. In our study, the well-performing series alone, including FR/VT ratio, are not good weaning parameter. A T-tube test, of about 30 min is a better indices to predict the result of the weaning protocol within 48 hours. Discontinuation from mechanical ventilation needs a daily evaluation : implementation of a weaning protocol and a multidisciplinary management should help us to decrease the duration of ventilation in the ICU.

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076

ENTERAL SEDATION IN THE CRITICAL PATIENT

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INTRODUCTION. The Clinical Practice Guidelines[1] have defined the standards for the sedation of critically ill patients. However, the use of the enteral route has been ignored, despite the evidence of a normal gut function even in the early period. Since the potential for reduced side effects and costs, we prospectively analyzed the efficacy of oral sedatives in patients receiving complex invasive treatment.

METHODS. Forty-two invasively ventilated patients needing sedation for at least 4 days were enrolled. Only high-level-of-care days[2] were analyzed. At admission, an IV infusion of Propofol or Midazolam was started. When indicated, Fentanyl was added for analgesia. Oral Hydroxyzine, plus oral Lorazepam when needed, was started as soon as possible through a nasogastric or nasojejunal tube. The aim was to taper intravenous sedation until suspension within 2-3 days. Otherwise, IV Lorazepam was introduced. The observed Ramsay score was compared to the requested one (2 or 3 in about 80% of the cases) three times a day. Moreover, patients' compliance to the administered care was defined every day as adequate, excessive or insufficient on a 24 hours basis.

RESULTS. Excluding the first two days of ICU admittance (84 days) in which IV sedation was protocol driven, a total of 577 days were analyzed. Invasive ventilation was present in 576 days. In 428 days (74.2%) pure enteral sedation was given, in 131 (22.7%) an IV/mixed sedation was used. In 18 days (3.1%) no sedation was needed. The observed Ramsay score matched the requested one in 66.9% of the cases during pure enteral sedation, but a score of 1 (patient anxious, agitated or restless) was reported in only 7.0%. The overall level of sedation was judged as adequate in 82.9% of enteral days and insufficient in 10.8%.

CONCLUSION. Adequate sedation may be achieved with enteral drugs in a majority of critical patients undergoing invasive ventilatory treatment. Though not investigated, decreased interference with haemodynamic status and ventilatory weaning process and reduced costs may be expected.

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077

LEFT VENTRICULAR DYSFUNCTION IN COPD PATIENTS. INFLUENCE OF ECHO GUIDED TREATMENT ON WEANING TIME

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INTRODUCTION. Early recognition and treatment of Left Ventricular Failure (LVF) in COPD patients with hypercapnic respiratory failure may reduce weaning time and mortality. We performed a transoesophageal echocardiography (TEE) study in patients with hypercapnic respiratory failure in order to identify the prevalence of LVF and the influence of a TEE guided cardiac treatment to the duration of mechanical ventilation (MV) and mortality.

METHODS. Over a period of six years, 78 consecutive patients (56M, 22F) mechanically ventilated for severe hypercapnic respiratory failure were included in the study. In all patients a TEE study was performed during the first 24 hours after intubation. In these 78 patients TEE revealed: normal heart in 17 (22%), RV failure in 27 (34,5%), LV failure in 13 (16.5%) and biventricular failure in 21 (27%). Patients were classified in two groups according to their TEE findings. Group I (44 patients) with normal heart or RV failure, Group II (34 patients) with LVF or biventricular failure. Cardiac treatment with inotropes, diuretics, and ACE inhibitors was performed according to the echocardiographic findings in both groups. Respiratory treatment and weaning process were identical in both groups. T-test and Chi-square test were used for statistical analysis.

RESULTS. TEE directed cardiac therapy resulted in a significant decrease of the duration of mechanical ventilation and mortality only in patients with LVF.

	Group I	Group II	
Age (years)	66±6	69±6	N.S
APACHE II score	18,5±6	17,8±6	N.S
PaO_2 (mmHg)	57±21	59±23	N.S
$PaCO_2$ (mmHg)	90±23	89±27	N.S
pH	7,18±0,1	7,16±0,1	N.S
Duration of MV (days)	14±11	5,5±6	p<0,01
Mortality (%)	43	29	p<0,05

CONCLUSION. In COPD patients with hypercapnic respiratory failure, LVF may be part or the unique problem for the acute respiratory decompensation. Early recognition and treatment of LV failure according to TEE findings may lead to better treatment, decreased duration of MV and lower mortality.

078

EVALUATION OF TWO OCCLUSION TIMES TO ASSESS RESPIRATORY DRIVE DURING PSV.

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INTRODUCTION. P0.1 is a reliable index of respiratory centers output. Old ventilators had demand valves opening delay above 100 msec allowing to estimate P0.1 without formal occlusion (P0.1t),while new ventilators opening time is below 100 msec impairing the measurements(2).Because of the pressure signal linearity during an occlusion, the analysis of a segment shorter than 100 msec may be a good estimation of the P0.1t(2).Aim of the study was to correlate the P0.1 measure with the one in the first 50 msec (P0.05).

METHODS. 20 intubated patients with ARF were enrolled. The PS was set to obtain a tidal Volume of 7-8 ml/kg (PS mean value 14±4 cmH_2O) with PEEP levels ranging between 5-7 cmH_2O. A pressure trigger was set at -1 cmH2O.P0.1 was randomly evaluated both performing in triplicate the formal occlusion (P0.1f) and by recording the magnitude of the effort in the first 100 msec during trigger activation (P0.1t).The P0.05 from the formal occlusion or from the beginning of the trigger (P0.05f and P0 .05t)was measured.

RESULTS. All values were doubled to assess the correlation with the standard measurements (P0.05df and P0.05dt versus P0.1f and P0.1t, respectively).Bland and Haltman method was performed.
Significant correlation between P0.1f and P0.1t (R2=0.68, p<0.001), P0.1t and P0.05dt (R2=0.99, p<0.001) and P0.1f and P0.05df (R2=0.97, p<0.01)was observed. The Bland and Haltman analysis confirmed a good agreement between all these couples of variables.

CONCLUSION. The main finding of this study is that P0.05 obtained during a formal inspiratory occlusion or during trigger activation (P0.05 f and P0.05t) is reliable substitute of the traditional P0.1 measurement. An important consequence for the clinical practice is represented by the possibility of having a simple and fast breath by breath determination of the respiratory drive even with actual ventilators which have a respiratory valve opening delay lower than 100 msec, provided that a pressure trigger is used.

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079

A CLINICAL EVALUATION OF SWALLOWING DISORDERS AS PREDICTING FACTORS OF EXTUBATION FAILURE

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INTRODUCTION. Standard weaning tests have not been proven sufficiently accurate for prediction of extubation success. Extubation failures have been shown related to excess mortality, prolonged ICU and hospital stay (Meade-Chest 2001). Aim: To evaluate prior extubation, the swallowing function as a predicting factor of extubation failure or success.

METHODS. Prospective multicentric study in patients intubated for more than 6 days in a medical and a surgical ICU with classic extubation criteria. Pre-existing swallowing disorders, ENT surgery sequelae and auto-extubation were excluded. Pre-extubation clinical swallowing function was performed by physical therapists and kept unknown from the intensivists. Criteria 1: motricity a/ to hold up head, b/ to open mouth, c/ to purse lips, d/ to grit teeth, e/ to stick out tongue. Criteria 2 : gag reflex. Criteria 3 swallowing process (4 integrated phases). Criteria were positive when all items were obtained. Reintubation (RI) within 8 days after extubation was considered as a failure.. Reasons for RI were classified as upper airways obstruction (UAO) (aspiration/excess secretions) or non UAO. Interest of the criteria to predict successful extubation was made by multivariate logistic regression (LR). The area, under the receiver operating characteristics curve (ROC) for all criteria, was calculated using cut-off points of prediction of RI issued from the LR.

RESULTS. (mean±SD) 61 pts (age 52±20 yrs, SAPS II 48±18) were included during 18 months. Mean duration of intubation was 15± 9 days. RI for UAO or for others causes occurred in 9 (14.5%) and 5 (8%) cases respectively. Criteria 1 and 3 were found independent predictors of RI. Based on the coefficients of the LR model a probability for RI is 77.8% of correct prediction. The area under the ROC curve was 80 %. RI of patients for swallowing disorders had the highest mortality (89%) compared to successful extubations (4.2%) (p<0.01).

CONCLUSION. Such a test for swallowing capacity seems to help in identification of high risk patients for extubation failure.

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THE USE OF END POSITIVE AIRWAY PRESSURE (EPAP) IN PATIENTS WEANING FROM MECHANICAL VENTILATION

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INTRODUCTION. The use of spontaneous EPAP in weaning from mechanical ventilation has been little explored. In theory EPAP can prevent airway collapse during expiration. The purpose of this study is to compare EPAP with pressure support ventilation (PSV) and T-piece in patients undergoing weaning in relation to oxygenation and auto- PEEP.

METHODS. Forty patients who needed mechanical ventilation for more than 48 hours in 2 general intensive care units were prospectively evaluated in a randomized cross- over study. All patients were submitted to the 3 methods. EPAP, PSV and T-piece, during 30 minutes. Each method was followed by a rest time, at least 30 minutes. They were monitored by VentTrack (Novametrix,USA). Parameters, measured at 15 and 30 minutes, were work of breathing (WOB), auto- PEEP (PEEPi), minute ventilation (MV), arterial oxygenation (SaO2) and respiratoty rate (RR). We analysed all groups and divided in COPD and non- COPD patients. Comparisons were done by one way analysis of variance and t test. The level of significance was 95%.

RESULTS. All patients: WOB 15min: EPAP (2.99±0.66) and T-piece (0.26±0.25), p=0.000; WOB 30min: T-piece (0.26±0.35) and PSV (0.64±0.25), p=0.000; WOB 30min: T-piece (0.26±0.35) and EPAP (1.02±1.31), p=0.000. COPD: WOB 15min: T-piece (0.21±0.23), PSV (0.63±0.20) and EPAP (0.91±0.31), p=0.003; WOB 30min: T-piece (0.24±0.31), PSV (0.59±0.24) and EPAP (0.75±0.30), p=0.001. Non-COPD: WOB 15min: T-piece (0.28±0.25) and EPAP (1.03±0.79), p=0.000; WOB 30min: T-piece (0.27±0.37) and PSV (0.66±0.26), p=0.000. PEEPi was no significantly different in the groups.

CONCLUSION. EPAP offered no reduction in PEEPi, besides increased work of breathing. In this study EPAP did not show any advantage over the others methods in patients undergoing mechanical ventilation.

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Grant acknowledgement: Thanks for the patients in the intensive care units.

Poster Session
Novel therapeutic approaches in sepsis – 081-094

081

VORICONAZOLE VS. LIPOSOMAL AMPHOTERICIN .THE HOST RESPONSE IN PATIENTS WITH SEVERE SEPSIS.

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INTRODUCTION. The aims were to correlate the host response(1) with clinical scores in patients with confirmed candidemia and bronchopneumonia treated with two recent antifungal agents.

METHODS. 17 patients subdivided into two groups: (V) 9 patients treated with Voriconazole 6 mg/Kg q12h, and 4 mg/Kg q12h for the following days; and (A) 8 patients treated with liposomal amphotericin 3 mg/Kg die, included with sepsis and confirmed candidemia with pneumonia. We monitored Antithrombin III (AT III), Protein C (PC) as coagulation inhibitor markers and C1-inhibitor (C1-INH). Coagulation inhibitor levels were assessed via functional, immunological and ELISA and C1-INH by a chromogenic assay. We have registered inflammatory cytokines levels in bronchial washing and plasma (IL 6, IL-10) by an ELISA assay. Data were collected at admission, at 1st and at 7th day after treatment.

RESULTS. Results are synthetically shown in table 1 and 2
Clinical Score and Markers Levels in Group A and Group V

	Admission (A)	Admission (V)	1^ day (A)	1^ day (V)	7^ day (A)	7^ day (V)
SOFA	9.8°(3)	10.3** (2)	8.5 (4)	8.3 (3)	6.7° (3)	5.6 **(2)
IL-6 (pg/ml)	361.2°° (54)	385** (48)	380 (45)	325.9 (37)	185.3°° (18)	126.3** (26)
IL-10 (pg/ml)	185 (27)	188.2* (16)	192.9 (16)	201.4 (22)	145.1 (22)	114.1* (19)
AT III (%)	56.3°° (12)	53** (15)	64.4 (26)	65.6 (21)	85.2°° (17)	94.3** (16)
PC (%)	68.1° (23)	65.3 (12)	92.8 (9)	59.1 (23)	96.7° (11)	89.2 (13)
C1-inh (%)	80.1 (23)	78.2* (26)	87.5 (16)	85.3 (21)	98.3 (41)	112.6* (19)

**/° Statistics between admission and 7^ day with p < .05 - **/°° Idem with p < .01*

CONCLUSION. These data confirm the role of IL 6, and specially of IL 10, as markers, in candidal sepsis. Our results don't permit to affirm that(V)treatment improves the outcome compared to(A) treatment, but V seems to modulate positively the inflammatory, coagulation and complement response reducing the organ dysfunction specially in the survivors. The changes registered are very interesting and a further examination will be useful.

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082

LINEZOLID VS VANCOMYCIN IN SEPTIC SHOCK. CHANGES IN THE SYSTEMIC HOST RESPONSE.

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INTRODUCTION. We compare Linezolid vs Vancomycin treatment in patients with gram+ septic shock (outcome) and to analyse whether significant differences are registered in the host response.

METHODS. A randomized, double-blind trial involved not neutropenic patients admitted in ICU from Dec. until March 2003. The patients involved were those with severe sepsis or septic shock with a positive culture for Gram+ and/or nosocomial pneumonia and/or complicated infections. Patients received iv Linezolid (LZD) 600 mg q12h for 14 days (Group L) or iv Vancomycin (VAN) 10 mg/Kg q12h,for the first 24 h and 5 mg/Kg q12h for the successive 13 days (Group V). We monitored Antithrombin III (AT III), Protein C (PC) and the C1-inhibitor (C1-INH). Coagulation inhibitor levels are assessed via functional (activity), immunological (antigen) and ELISA.C1-INH is measured by a chromogenic functional assay. We have also registered the SOFA score until the discharge.

RESULTS. Of 15 patients 8 have received LZD and 7 VAN. The clinical data and results are synthetically registered in table 1 that shows the levels of the tested markers in the 2 groups.

Clinical Score and Markers Levels in Group V and L

	Admission (L)	Admission (V)	1st day (L)	7th day (V)	14th day (L)	14th day (V)
SOFA	8.3 (2)	9.6 (1)	8.3 (3)	8.2 (3)	5.3 (4)	6.2 (4)
AT III (%)	45.2° (11)	52.6* (16)	56.2 (21)	62.4 (19)	66.2° (37)	79.4* (32)
PC (%)	65.4° (9)	53.2* (16)	66.4 (11)	61.2 (13)	56.4° (31)	76.1* (32)
C1-inh (%)	65.7° (12)	70.2 (13)	82.9 (19)	72.4 (16)	91.9° (23)	78.4 (36)
Compl. A (%)	55.4 (9)	62.6 (13)	57.1 (13)	61.6 (7)	59.4 (30)	75.6 (29)
IL-6 (pg/ml)	348.6° (54)	378* (48)	375.2 (45)	320 (37)	103.2° (78)	124.6* (76)

°/ $p < .05$*

CONCLUSION. The differences evidenced for the outcome are not significant. It's interesting to notice the different modulation of the host response and especially of the complement system This different response is also conditioned by the clinic timing of the sepsis. This pilot study reports that LZD doesn't improve the outcome but influences the host response reducing the organ dysfunction in the survivors.

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INDOMETHACIN AND MELOXICAM IN ADULTS WITH BACTERIAL SEPSIS AND PURULENT MENINGOENCEPHALISIS

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INTRODUCTION. Non-steroidal drugs used as adjunctive therapy(AT) in adults with bacterial sepsis and purulent meningoencephalitis (bs-pme) influenced beneficially on clinical course and outcome of the disease in some cases. COX-1, COX-2 inhibitors e.g. indomethacin-used in these patients sometimes may reveal side effects, which are not observed in subjects treated with COX-2 specific inhibitors. The aim of this preliminary study was comparison of influence of indomethacin and meloxicam (Movalis)-COX-2-specific inhibitor - on clinical course and sequels of bs-pme in adults.

METHODS. Between 1999-2002 in 17 patients of our Department bs-pme was diagnosed. *N. meningitidis* was the etiological factor in 26% and *Str. pneumoniae* in 22% of cases. In the remaining 52% of patients the aetiology was not revealed. All subjects were divided at random way into following groups:I-11 patients (mean age 41yrs.) treated with antibiotics, symptomatic drugs and indomethacin (120mg/day, beginning from the 1st day of therapy),II-6 patients (mean age 38yrs.)treated with antibiotics, symptomatic drugs and meloxicam (15mg/day, beginning from the 1st day of therapy). In all patients the following parameters of cerebrospinal fluid (CSF) were assessed: pleocytosis, protein, glucose, lactic acid, TNF alpha, IL-1beta and CRP concentrations. The samples of CSF were taken on the 1st, the 4th and the 10-14th day of treatment.

RESULTS. Mean period of fever and consciousness impairment persisting as well as the time of hospitalisation were comparable in both groups of patients. In subjects, who survived, of the group I faster normalisation of CSF protein, CRP, TNF alpha and IL-1beta concentrations was noted, compared to group II. In fatal cases values of these parameters were increased within the whole monitoring. Deafness, partial deafness, paresis and paralysis were as sequels of the disease in some cases. Side effects of used drugs were not observed.

Results of treatment	Recovery	Death	Sequels
Group I	54%	18%	28%
Group II	33%	33%	33%

CONCLUSION. Indomethacin used in adults with bs-pme as AT exerts beneficial influence on clinical course and outcome of the disease compared to meloxicam.

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METRONIDAZOLE TARGET-SITE CONCENTRATION OF PATIENTS IN SEPTIC SHOCK REACHES THE SUFFICIENT LEVEL

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INTRODUCTION. Sepsis and septic shock are the major causes of mortality in ICU. The target-site concentration of antibiotics in patients in septic shock, such as Beta lactams, has been evaluated in several studies. These studies have shown difference between drug concentrations in healthy volunteers and septic patients. The rationale for the present study was to investigate the target-site concentration of an antianaerobic drug. The aims of the study were (1) to evaluate the concentration of Metronidazole (MDZ) in the muscle tissue (target-site) using microdialysis technique in patients in septic shock and (2) to compare it with both plasma concentration and in vitro predefined MIC_{90} (minimal inhibiting concentration) for the most frequent anaerobic bacteria isolated in our hospital.

METHODS. Six patients admitted to the General ICU of Tartu University Clinics with diagnosed septic shock according to ACCP/SCCM consensus conference criteria were included. Patients with BMI more than 30 were excluded from the study. Microdialysis catheters (CMA 60 catheters with 20 kDa cut-off membrane) were placed into the vastus lateralis muscle. CMA 107 microdialysis pump was used with the perfusion rate of 2 mkl/min. Retrodialysis was used to determine recovery of the MDZ from the muscle tissue. MDZ 500 mg was given by intravenous infusion over 10 min. During the first three hours sampling was performed after every 30 min and then after each hour up to ten hours after drug administration. Blood samples were taken simultaneously with microdialysis samples.

RESULTS. MIC_{90} for *Bacteroides fragilis* group was 0.25 mg/l. MDZ concentration in blood achieved the maximum value of 10.78 mg/l at 30 min, while in the muscle maximum point of 5.97 mg/l has been achieved at 60 min. Ratio Cpeak / MIC_{90} was considered as surrogate marker of antimicrobial effectiveness. It was 43 and 24 for plasma and muscle respectively.

CONCLUSION. The present data demonstrate that MDZ plasma and muscle tissue concentrations in patients in septic shock reach values far greater than MIC90 for Bacteroides group and there is no doubt in effectiveness of metronidazole against susceptible anaerobic bacteria.
Grant acknowledgement: This study was supported by Estonian Science Foundation grant no. 5304.

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TREATMENT WITH THE EXTRACORPOREAL ENDOTOXIN ADSORBER MATISSE IN GRAM-NEGATIVE SEPSIS

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INTRODUCTION. Endotoxin is released from Gram-negative bacteria and is a major factor in the pathophysiology of sepsis. MATISSE® is a new endotoxin adsorption system based on macroporous beads immobilised with human serum albumin. In-vivo experiments had shown favourable LPS elimination properties (1).

METHODS. Open, controlled, prospective, randomised, multi-centre clinical trial to investigate the efficacy and safety of the endotoxin adsorber in addition to standard therapy in septic patients suffering from Gram-negative infection. 145 patients with severe sepsis or septic shock were enrolled. Primary endpoint was the proportion of responders (defined as decrease in the APACHE II score by at least 4 points from study entry to day 4). Secondary objectives were the SOFA score, length of ICU stay, survival rate, and safety of the adsorber treatment.

RESULTS. A total of 143 patients fulfilled the entry criteria. 76 patients received standard treatment and 67 patients apheresis treatment additional to standard therapy. The overall proportion of responders was 64% for the apheresis group vs. 57% for the standard (p=0.152). In the peritonitis patients, a slightly higher proportion of responders was observed with apheresis (69%) vs. standard treatment (54%, p=0.084); the APACHE II and SOFA scores tended to decrease more over the 4 days with the apheresis treatment. The decline in the SOFA score reached significance; the renal SOFA sub-score improved significantly in the apheresis group. No difference in the adverse event profile and no difference in survival were found between the two groups. The length of stay on ICU tended to be shorter for apheresis treated patients especially in peritonitis patients (3.3 days, p=0.12).

CONCLUSION. Apheresis treatment did not affect APACHE II, rate of occurrence of side effects, duration of ICU stay, or survival rates in Gram-negative sepsis. However, in patients with Gram-negative sepsis due to peritonitis, apheresis was associated with a greater improvement in SOFA score, renal function and a tendency towards a shorter ICU stay.

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086

RENAL RECOVERY DURING ENDOTOXIN ADSORPTION IN PATIENTS WITH SEVERE SEPSIS - FIRST CLINICAL RESULTS

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INTRODUCTION. Endotoxin (ET) is a major factor in the pathophysiology of Gram-negative sepsis leading to excessive cytokine release and multi organ failure. MATISSE® is a new endotoxin adsorber system showing favourable ET elimination properties (1).

METHODS. A total of 143 patients with severe sepsis and suspected Gram-negative infection were studied in an open, controlled, randomised trial. We evaluated 104 peritonitis patients. Patients received standard treatment or standard treatment plus ET adsorption applied for four days. Objectives were the SOFA and APACHE II score, survival rate and organ dysfunction.

RESULTS. In peritonitis patients the SOFA score decreased significantly (p=0.03)over the 4 days for the adsorber treatment as well as the renal SOFA sub-score improved significantly at day 3 and 4 (p<0.05). The renal SOFA sub-score was the most important single parameter for survival at day 4 (ROC-curve: 0.749; 87.3% survived with value =<1, but only 39.4% with value >1). A rapid decreased of 20.3% in creatinine concentrations was observed in the adsorber group. There was no significant difference in survival between the two groups.

	Adsorber* Baseline	Day 4	Standard* Baseline	Day 4
SOFA Score	12.0±2.1	10.3±3.7	11.3±2.4	10.9±3.9
Creatinine mikromol/l	143.1±88.2	114.0±71.2	155.5±101.6	149.8±95.3

** mean ±SD*

CONCLUSION. In the present study in peritonitis patients the decline in SOFA score and renal SOFA sub-score improved significantly in the ET adsorber group. Creatinine levels were lowered more rapidly.

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087

IGM-ENRICHED IMMUNOGLOBULIN TREATMENT, BUT NOT IGG TREATMENT IMPROVES SEPTIC MICROCIRCULATION

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INTRODUCTION. To investigate whether immunoglobulin M-enriched immunoglobulin treatment has protective effects on microcirculatory disorders during endotoxemia. These disorders include endotoxin-induced leukocyte/ endothelial cell interaction and capillary perfusion failure.

METHODS. In skin fold preparations of hamsters normotensive endotoxemia was induced by i.v. administration of 2 mg/kg endotoxin (LPS, 2mg/kg). IgM enriched human immunoglobulins (IgM, n=7 animals) or IgG immunoglobulin preparations (n=6) were substituted intravenously 5 min before LPS administration. Saline-treated animals (n=6), receiving only LPS, served as controls.

RESULTS. IgM enriched immunoglobulins blocked LPS effects to a significantly higher extent when compared to IgG preparations: Compared with controls and IgG animals, IgM-enriched immunoglobulins significantly reduced LPS-induced arteriolar and venular leukocyte adherence (p<0.01) and prevented depression of functional capillary density (FCD) (p<0.01), while IgG preparations failed to significantly improve both parameters.

CONCLUSION. We conclude that specific IgM interactions with endotoxin, endothelial cells, or angry leukocytes rather than IgG properties are the mechanism of IgM-mediated attenuation of leukocyte/ endothelial cell interaction and capillary perfusion failure.

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088

ADMINISTRATION OF POLICLONAL IMMUNOGLOBULINS IN SEPTIC SHOCK: EFFECTS ON CYTOKINES KINETICS AND SOFA

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INTRODUCTION. Despite the availability of potent antibiotics and the resources in the intensive care units, mortality rates from septic shock and Multiple Organ Dysfunction Syndrome are 40-70%. We assessed the effects of administration of polyclonal immunoglobulins (Pentaglobinâ) on serum TNFa, IL-6 and IL-10, organ dysfunctions (by SOFA score) and mortality of patients with culture-positive gram-negative septic shock.

METHODS. In a randomized, two-center, double-blinded, placebo-controlled clinical trial, 24 patients were given policlonal immunoglobulins (n = 15) or albumin (n = 9), together with the first dose of betalactam antibiotics. We analyzed 0, 4 and 24-hour post-antibiotic serum TNFa, IL-6 and IL-10, SOFA score on the 2 post-inclusion days and mortality at 28 days.

RESULTS. The general APACHE II score was 19 (13-32) points, with a death risk of 41,9 ± 21,5 %. The 28-day mortality was 50%. The SOFA score on the second day of the intervention group was significantly lower than on the first day (p = 0,03). Serum TNFa was higher in the intervention group at the 4-hour measurement and decreased significantly after 24 hours, in relation to 4-hour time. IL-6 and IL-10 levels were not different between the two groups at all times. The patients treated with immunoglobulins, with a death risk up to 50%, had a significantly lower mortality (20% X 50%, p = 0,05).

CONCLUSION. The TNFa kinetic in the group treated with policlonal immunoglobulins revealed significantly higher levels 4 hours after the beginning of the antibiotic therapy and lower levels after 24 hours. The degree of organ dysfunctions was reduced after 24 hours in the intervention group. The patients with a intermediate death risk had a significantly lower mortality after 28 days.

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FLUID RESUSCITATION WITH COLLOIDS OF DIFFERENT MOLECULAR WEIGHT IN SEPSIS

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INTRODUCTION. Data is lacking regarding the distribution of colloids with different molecular weight in septic shock (1,2). The aim of our randomized, controlled trial was to evaluate the efficacy of fluid resuscitation with gelatine (GEL, average molecular weight 30kD) and hydroxyethyl starch (HES, average molecular weight 250 kD) in hypovolaemic, septic shock patients.

METHODS. Inclusion criteria were septic shock according to Bone's classification, mechanical ventilation with PaO2/FiO2<250 mmHg and hypovolaemia as indicated by the intrathoracic blood volume index (ITBVI)< 850 ml/m2 measured by transpulmonary thermodilution (PiCCO). Following randomization out of the 19 recruited patients 10 received HES and 9 GEL. Fluid resuscitation was commenced in 250ml/15min boluses (max. 1000 ml until the end point ITBVI>900 ml/m2 was reached.) Repeated haemodynamic measurements were done when fluid resuscitation was indicated (t0), at the end point (te) then at 30 and 60 minutes after the end point was reached (t30, t60). Cardiac index, stroke volume index, extravascular lung water index, oxygen delivery index was determined at each assessment points. For statistical analysis two-way ANOVA was used.

RESULTS. ITBVI, cardiac index, stroke volume index, oxygen delivery index increased significantly at te and remained elevated for t30 and t60. Extravascular lung water index was normal. There was no significant difference in the haemodynamic variables between the two groups. The efficacy of intravascular volume expansion was described by the average change in ITBVI caused by 100 ml of infusion. This did not show significant difference between the groups (HES: 16.3±6.9 ml/m2 vs. GEL: 18.2±5.5 ml/m2; p=0.394).

CONCLUSION. The results of this study indicate that both HES and GEL infusions regardless of their molecular weight have similar effects on preload in septic shock patients, without increasing extravascular lung water.

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CARDIAC AND VOLUMETRIC RESPONSE TO TWO DIFFERENT COLLOIDS IN SEPTIC PATIENTS

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INTRODUCTION. Early fluids infusion to correct hypovolaemia and increase DO2 improves survival in septic patients [1]. Aim of this study is to investigate 1-the haemodynamic and volumetric response to two different colloid infusion in septic patients.2- the correlation between filling pressure, volumetric parameters and cardiac function during the infusion of colloids.

METHODS. 40 septic patients were mechanically ventilated and connected to an integrated monitoring system - PICCO system / Agilent - by a fiberoptic arterial catheter (pv 2014L16) and a central venous catheter. All patients were randomised to have 7 ml / Kg of Haesteril 200 Haesteril ® (group A) or 7 ml / Kg of Haesteril 130 Voluven ®- (group B) in 30 minutes. At T0 (basal time) and T1 (after colloid infusion) main haemodynamic and volumetric parameters were studied. All data are expressed as mean±sd. Paired or unpaired T test was used to compare changes in the groups. Linear correlation was used to study correlation between CVP ITBVI and cardiac function

RESULTS. At Table 1 and Table 2 are reported main haemodynamic and volumetric data . DeltaCI and DeltaSVI correlated with DeltaITBVI (r2 = 0,6 p < 0,001) better than Delta CVP.

Haemodynamic data	Group A T0	Group A T1	Group B T0	Group B T1
CI L min / m2	3,8±0,9	4,34,3±1,2*	3,68±0,9	4,18±0.8*
CVP mmHg	8±4	11±4 *	7,6±5	10±5 *
MAP mmHg	74±12	85±13*	78±10	83±10*
ITBVI ml/m2	664±166	785±193*	643±145	733±138 *
EVLWI ml/ kg	9,5±3	9,8±2	8,2±2	9,7±3
SVI ml/m2	31±8	42±9*	35±8	42±7*

** p< 0,05 * p< 0.001 versus basal time.*

CONCLUSION. Both Haes 200 and Haes 130 improved homodynamic and cardio thoracic volumes in septic patients, without increasing EVLW 2- ITBVI correlates with indices of cardiac function better then CVP.

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EFFECTS ON PLASMA VOLUME IN A MODEL OF PORCINE SEPTIC SHOCK: 130/0.4 HES VS. RINGER'S SOLUTION

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INTRODUCTION. We compared effects of hydroxyethyl starch (HES) 130/0.4 and ringer's solution (RS) on maintenance of plasma volume (PV) in septic shock with capillary leakage syndrome (CLS).

METHODS. 14 anaesthetized pigs (23.1 ± 2.4 kg) received 0.75g/kg faeces into abdominal cavity to induce sepsis for 6h. Animals were randomized to volume replacement therapy with 6% HES 130/0.4 (n=5), RS (n=5), and compared to a non-septic control group receiving 6% HES 130/0.4 (n=4). Infusion rate was titrated to maintain a central venous pressure of 12 mmHg. PV was determined using Cr-51 erythrocytes and albumin escape rate (AER) using iodine 125-labeled albumin. Systemic haemodynamics and oxygenation were measured. For statistics Wilks-Lambda & Ryan-Einot-Gabriel-Welsh-F-test were used.

RESULTS. see table 1.

	Ringer's solution	6% HES 130/0.4	Control
PV: 51Cr [ml/kg] Preshock	52.6 ± 5.1	57.0 ± 6.3	51.0 ± 2.3
PV: 51Cr [ml/kg] 6h septic shock	30.4 ± 14.0 * *	57.6 ± 7.0	61.3 ± 3.9
CO [ml/min/kg] Preshock	131 ± 34	124 ± 14	130 ± 39
CO [ml/min/kg] 6h septic shock	90 ± 18 * *	166 ± 28	145 ± 31
SvO2 [%] Preshock	75 ± 6	66 ± 6	71 ± 7
SvO2 [%] 6h septic shock	40 ± 14 * *	65 ± 8	70 ± 8

** p<0.05 vs control; ** p<0.05 HES 130 vs RS, CO = Cardiac output*

CONCLUSION. In this porcine septic shock model with concomitant CLS, 6%HES 130/0.4 could maintain PV and preserve systemic oxygenation and haemodynamics significantly better than RS.

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EARLY VASOPRESSIN INFUSION DURING SEPTIC SHOCK

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INTRODUCTION. High catecholamines dose may cause several adverse effect. Hypothesis Vasopressin infusion has an additive vasopresor effect.

METHODS. Patients which fulfilled the ACCP-SCCM septic shock criteria were recruited.They were adequately volume resuscitated (PWCP >15 cmH2O).Exclusion criteria: pregnancy, acute coronary disease, acute mesenteric ischemia, and severe hyponatremia. Vasopressin infused at 0.040 u/min and norepinephrine was started at 5mu/min titrate to maintain mean arterial pressure constant(MAP >75mmHg).We measured mean arterial pressure, cardiac output and index, vascular and pulmonary resistance, urinary output, norepinephrine requirements, and data were collected at 2, 4, 8, 12 and 24 hrs intervals. Also EKG, Troponin I, DDimer and protein C determination at baseline and 24 hrs period to asses cardiovascular and haematological safety were recorded.

RESULTS. Sixteen patients, 10(62.5% male). 65±15 years old, APACHE II score at baseline and 24 hrs period was(30.1 ± 9.5 vs 23±7.4;p<0.009).Vasopressin infusion increased urinary output (32.12 ± 9.3 to 233 ± 12.3; p<0.001) from baseline to 24 hr period with no change in urinary density.(1.010-1.007)Vasopressin did not appear to have side effects on other organ function and did not alter EKG findings and trop I determinations.

Haemodynamics

	Baseline	2 hrs	4 hrs	8 hrs	12 hrs	24hrs
WCP cmH20	15.3±4.71	14.83.9	13.6±2.52	13.2±2.07	12.6±2.1	11.25±28
MAP mmHg	59.7±11	76.7±16.5*	79±14*	81±10.2*	86.2±11.0*	89.8±8.1*
NE mu/min	24±18.4	16.1±13.87	15.5±12.42*	12.56±12.05*	7.31±5.84*	5.0±3.3*

**p< 0.05*

CONCLUSION. Early vasopressin infusion has an additive effect allowing to decrease the norepinephrine dose, improving urinary output and some urinary function, without any evidence of cardiac or haematological damage during the 24 hours infusion period.

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CONTINUOUS VENOVENOUS HEMOFILTRATION IN THE POST-TRAUMATIC MULTIORGAN DYSFUNCTION: STUDY OF MORTALITY

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INTRODUCTION. The use of continuous venovenous haemofiltration (CVVHF) in cases of multiorgan dysfunction (MODS) seems to associate with a decrease of the mortality in some studies.

METHODS. Prospective 48-month cohort analysis in a Trauma Unit. All the patients in those a seven days uniform protocol of CVVHF was applied by MODS without renal failure were included. We consider two groups, one of precocious beginning of the technique (before the 48 hours of hospital admission) and another of late beginning (later to that period). Age, sex, injury severity score (ISS), revised trauma score (RTS), time of stay in ICU and evolution (survival or exitus) were analyzed. Clinical and filtration data were also analyzed. We compared predicted mortality according to TRISS methodology with the real mortality obtained in the series. The statistical analysis was carried out with the SPSS package. The 95% confidence interval was used to compare mortality between groups.

RESULTS. A total of 116 patients (91 males) were haemofiltrated. Mean age was 36 years (SD 12). Mean ISS 43 points (SD 10). Mean prognostic RTS 5.65 points (SD 1.7). Mean stay of 28 days (SD 14). AN69 membrane was used in every patient. Mean ultrafiltrate rate was 20 ml/min. Mean filter replacements were of 14 filters for patient during the studied period (SD 5). We did not have any complication during the CVVHF. The precocious beginning was carried out in 75 patients (64,6%) and late beginning in the rest. Real global survival of 82,75% (96 patients). Predicted TRISS survival was of 63% (P<0.05). The group of precocious beginning had a real survival of 86,66% (65 patients) while the predicted TRISS survival was of 60% (P<0.05).

CONCLUSION. Mortality in CVVHF trauma patients with MODS was lower than predicted by illness severity scores. This descent is especially attractive in the group of precocious beginning.

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094

THE IMPACT OF TIMING OF SURGICAL INTERVENTION ON SURVIVAL IN PATIENTS WITH SEVERE ACUTE PANCREATITIS

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INTRODUCTION. Morbidity and mortality after surgery for severe acute pancreatitis (SAP) remains considerable. There is evidence that postponing surgery leads to improved survival, but reports included patients operated for different indications (such as absence of clinical improvement after 3-5 days), which may be an important bias. The objective of this study is to analyze the impact of timing of surgical intervention on mortality in patients with SAP, and to correlate this with the presence or absence of infected necrosis at the time of surgery.

METHODS. We retrospectively (01/1994-03/2003) analyzed all patients admitted to the ICU with severe acute pancreatitis. 56 out of 124 patients were treated surgically, and these are the subject of this analysis. We recorded demographic characteristics, incidence of organ failure, data on surgical and medical treatment and disease severity. Twenty seven patients (48%) were operated in the first two weeks after admission to the hospital (group A, early surgery), and 29 later than two weeks after admission (group B, late surgery).

RESULTS. Age, gender distribution, APACHE II score on admission and aetiology of SAP were comparable in group A and B, but CRP levels at admission were higher in group A (22.7 vs. 11.9, p=0.04). Mortality was 48% in group A, and 31% in group B (p=0.19). When only patients with documented infection at operation were considered (n=26), 10 patients were operated early (mortality 10%), and 16 late (mortality 25%)(p =0.34). On the other hand, patients with sterile necrosis at operation (n=30) had a trend towards a higher mortality when operated early (n=17, mortality 70%) versus late (n=13, mortality 38%)(p=0.08). These patients were older at admission (59 vs. 49 year, p=0.04), but other characteristics were not different.

CONCLUSION. Mortality in patients operated early in the course of the disease was not significantly different from patients that were operated later. There is a trend towards increased mortality in patients operated early for other indications than documented infection. In the presence of infected necrosis, there is no evidence to defer surgical intervention, also when diagnosed early in the course of the disease.

096

IN VIVO MONITORING OF ENDOTOXIN-INDUCED MYOCARDIAL APOPTOSIS WITH 123 I-ANNEXIN V.

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INTRODUCTION. Is in vivo imaging of LPS-induced myocardial apoptosis possible? To address this issue, we performed consecutive whole body scans in endotoxemic rats, injected with ^{123}**I-Annexin V** (AnxV*), a sensitive marker of apoptosis. Further analysis of the cardiac image has been carried out by ex vivo assessment of blood and myocardial AnxV* uptake.

METHODS. AnxV* was produced with a radiochemical purity higher than 97% as confirmed by HPLC [1]. 6H before tracer injection (**1.25 mCi, 50 ug AnxV***),Sprague-Dawley rats were either given IV:saline (0.5ml): **control group, n=3**, or LPS from E Coli (30mg/kg):**LPS group, n=6**). Whole body scans were performed with a SPECT camera at 40 min, 6 and 14H after tracer injection. A syringe containing ^{123}Iodine (8-10Ci), was scanned to semi-quantify activity in the cardiac area. Results are expressed as a mean percentage ± SD of injected dose(%ID). Statistical analysis was performed by Mann-Whitney test and a p value < 0.05 was considered as significant (*).

RESULTS. Cardiac area AnxV* uptake is significantly increased in the LPS group at 6 and 14H after tracer injection, suggesting increased myocardial apoptosis. Heart and blood uptakes are also increased in LPS groups.

^{123}I-AnnexinV Uptake	Control 30 min	LPS 30 min	Control 6H	LPS 6H	Control 14H
Cardiac Area (%ID)			1.76 ± 0.32	**3.12 ± 1.04 ***	0.79± 0.09
Blood (%ID/g)			0.20 ± 0.03	0.55 ± 0.11 *	±
Heart (%ID/g)			0.04 ± 0.01	0.17 ± 0.03 *	

CONCLUSION. Intra-cardiac blood mass activity and myocardial uptake should be considered as two main components of the cardiac image. In vitro studies at 6H demonstrated that the mean heart/blood activity ratio per g of tissue varies from 1/5 (control) to 1/3 (LPS).It suggests that increased blood activity and cardiac volume also contribute to image cardiac area beside specific myocardial activity.

Poster Session
From bench to bedside (I) – 095-108

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IS IN VIVO IMAGING OF LPS-INDUCED MYOCARDIAL APOPTOSIS WITH 123 I-ANNEXIN V RELEVANT ?

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INTRODUCTION. We imaged endotoxemic rats with ^{123}**I-Annexin** V (AnxV*), a sensitive radioligand of apoptotic cells and measured ex vivo blood and heart uptake of the tracer to discuss image specificity .

METHODS. 6H before tracer injection (1.25mCi,50 mug AnxV for imaging or 300muCi,10mug AnxV for ex vivo counting) Sprague-Dawley rats were given IV: saline or 30mg/kg of LPS.Whole body scans were acquired at 40 min, 6H and 14H with a Toshiba GCA-9300A/hg camera. A cardiac region of interest was drawn and correlated with a standard syringe (8-10 muCi) to semi-quantify tracer uptake. Results are expressed as a mean % ± SD of the injected dose,%**ID** for **imaging**, and as **%ID/g of tissue** for **ex vivo counting** of blood and heart activity. Statistical analysis was performed by Mann-Whitney test and a p value <0.05 was considered as significant (*).

RESULTS. AnxV* uptake in LPS groups is significantly increased at 6 and 14H in vivo and at any times ex vivo.

in vivo and ex vivo AnxV * uptake

Biodistribution time % Injected Dose ± /g	40 min Mean ± SD	6H Mean ± SD	14H Mean ± SD
Cardiac region Control n=3	3.26 ± 0.19	1.76 ± 0.32	0.79 ± 0.09
LPS n=6	3.35 ± 0.34	**3.12 ± 1.05 ***	**2.45 ± 0.66 ***
BLOOD Control n=8	0.91 ± 0.20	0.27 ± 0.05	0.20 ± 0.025
LPS n=8	**1.66 ± 0.18 ***	**0.65 ± 0.09 ***	**0.55 ± 0.012 ***
HEART Control n=8	0.27 ± 0.06	0.06 ± 0.01	0.04 ± 0.01
LPS n=8	**0.49 ± 0.04 ***	**0.21 ± 0.025 ***	**0.17 ± 0.04 ***

** compared to control*

CONCLUSION. Intra-cardiac blood volume and increased blood uptake in LPS groups may affect image specificity according to heart/blood mass and activity ratios.

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ENDOTOXIN-INDUCED CARDIAC DYSFUNCTION IS ENDOTHELIN-DEPENDENT AND COUNTERACTED BY TEZOSENTAN

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INTRODUCTION. The pathophysiology behind septic myocardial depression is complex and not fully elucidated. Endothelin-1 (ET-1) has been discussed in this context. ET-1 seems to be involved in cardiac diseases, with elevated ET-1 plasma levels seen in myocardial infarction and congestive heart failure (CHF). ET receptor antagonism has been beneficial in treatment studies of CHF. The ET system seems to be involved in the pathophysiology of sepsis with increased plasma levels seen in human septic shock and ET-1 has been suggested as a predictor of outcome in these patients.

METHODS. 37 pigs were anaesthetised and subjected to echocardiography, coronary sinus catheterisation and monitoring of central and regional haemodynamics to assess cardiac performance. All animals received endotoxin for five hours. 20 pigs served as endotoxin controls. Tezosentan, a dual endothelin-A and -B receptor antagonist was administered during established hyperdynamic endotoxaemic shock. 7 pigs received an infusion of tezosentan of 1 mg/kg/h (tezo1) and additional 10 pigs received a higher dose of 10 mg/kg/h (tezo10).

RESULTS. Endotoxaemia evoked a hyperdynamic shock with pulmonary hypertension, metabolic acidosis and elevated cardiac blood flow. A decrease in stroke volume and coronary perfusion pressure as well as an increase in troponin I was noted. Tezosentan i.v. resulted in increases in cardiac index, stroke volume index, LVSWI and left ventricular end-diastolic area index (LVEDAI). Decreases in systemic and pulmonary vascular resistance indices were evident. No changes in heart rate, systemic arterial or pulmonary capillary wedge pressures were seen in tezo1 animals compared with controls. Metabolic parameters were improved by tezosentan. These effects were sustained only in the tezo1 group. In the higher dosage, tezosentan resulted in a deterioration of cardiac performance and 50 % mortality. The endotoxin-induced increase in troponin I was attenuated with tezo1 as compared with controls.

CONCLUSION. In this porcine model of volume-resuscitated, hyperdynamic endotoxaemic shock, endothelin-receptor blockade with tezosentan improved cardiac performance. However, the effect was not sustained with higher doses of tezosentan possibly due to reduced coronary perfusion pressure. These findings show that endotoxin-induced cardiac dysfunction is endothelin-dependent and, provided dosing is accurate, tezosentan might prove useful in septic conditions.

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MUSCULAR FAILURE IN SEPTIC PATIENTS: INVOLVEMENT OF PROTEOLYTIC UBIQUITIN PATHWAY

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INTRODUCTION. ICU muscular failure, particularly in septic patients, leads to prolonged complications and poor outcome (1). iNOS pathway (2) and ubiquitin proteolytic pathway (3) could be involved. Indeed, iNOS-induced peroxynitrite production was recently shown to nitrate proteins and ubiquitin pathway is known to be involved in nitrated proteins breakdown (4). The aim of this study was to show ubiquitin (ub) and ubiquitinated proteins (ubiq prot) expression and to compare their expression in 2 different muscular groups, rectus abdominis muscle (RA) and lateral thigh (LT) from septic and control patients.

METHODS. A muscular sample from RA or LT was performed during the 24st hours of septic shock or in the onset of elective surgery in non-septic patients (control group, approved by ethical committee). Expression of ub and ubiq prot are identified by Western-Blot (monoclonal antibody; arbitrary units:UA). SAPS II Score was calculated the day of muscle biopsy. A Kruskall-Wallis test was used.

RESULTS. The source of sepsis was peritonitis (n=11), central venous line infection (n=1), pneumonia (n=1), meningitis (n=1), necrotizing fasciitis (n=1) and gangrenous gall bladder (n=1).

	Septic RA (n=9)	Septic LT (n=7)	Control n=6
ubiquitin	11.6±4.3*	12.5±6.0*	6.3±2.8
ubiq prot	49.2±20.5*	34.5±16.5*	24.8±7.0

*given as mean±SE. *p<0.05 vs control*

CONCLUSION. We show that, in septic patients, proteolytic ubiquitin pathway is (i) stimulated, (ii) active and (iii) diffuse to several muscle groups including LT that was distant from the source of infection.

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OXIDATIVE STRESS IN PATIENTS WITH POSTOPERATIVE SEPSIS- INDICATOR OF TREATMENT WITH MAXIPIME

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INTRODUCTION. Active oxygen species consist of certain radical and non-radical molecules such as superoxide (O2_), hydroxyl radical (HO), hydrogen peroxide (H2O2) and singlet oxygen (1O2). It is becoming increasingly clear that active oxygen species are associated with the complication of multiple organ dysfunction in septic patients. We tried to understand the kinetics and to clarify the correlation between these molecules and severe sepsis complicated with organ dysfunctions as an indicator of the treatment with Maxipime.

METHODS. A total of 20 patients who had undergone various forms of gastrointestinal surgery were studied, developing postoperative severe sepsis with MODS (multiple organ dysfunction syndrome). These patients are 13 women and 7 men, aged between 52 and 76 years. The underlying diseases were rectal cancer (8 patients), colon cancer (8 patients) and gastric cancer (4 patients). Maxipime is a fourth generation of cephalosporine with a broad spectrum of activity (including many of Gram-positive and Gram-negative pathogens responsible for severe sepsis in hospitalized patients). Maxipime 2G bd was empirically administred, associated with aminoglycoside (Amikacine or Gentamicine) and Metronidazol. The bacterial susceptibility to Maxipime was later confirmed by the bacteriological tests. Peripheral blood was obtained from all patients as soon as severe sepsis with MODS was diagnosed. We performed indirect methods for monitoring oxidative stress: for lipid peroxide - Carbonneau method; for ceruloplasmine activity - Schosinski method and for protein -free SH group in blood plasma - Albini method, before the initiation of the treatment with Maxipime and after 24/ 48 hours.

RESULTS. The results were extremely suggestive, with marked decreasing of the levels of MDA, SH and ceruloplasmine, well correlated with the other clinical and biological parameters in 17 patients who survived. The other three patients showed no benefit from the treatment with Maxipime. The levels of the markers for oxidative stress were constantly high related with poor outcome.

CONCLUSION. Despite the small number of patients investigated, we found that the studied parameters of oxidative stress at patients with severe postoperative sepsis are an indicator of treatment efficiency.

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LEUCOCYTES MIGRATORY CAPACITY AND REACTIVE OXYGEN SPECIES IN PATIENTS UNDER INFLAMMATORY STRESS

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INTRODUCTION. Polymorphonuclear leukocytes (PMNs) represent the foremost line of defence against bacterial and fungal pathogens. Migratory capacity and release of reactive oxygen species (ROS) are crucial to their efficiency in host defence, but they can also cause damage to the organism. We investigated parallels between these functional parameters in patients under inflammatory stress.

METHODS. Four women after preterm premature rupture of membranes, who were delivered spontaneously (2) or by caesarean section (2); four patients with sepsis according to ACCP/SCCM criteria. PMN functions were measured daily from admission until discharge from the hospital. Seventy data pairs from healthy persons served as control. Laboratory method: PMN migration was measured in 30 L fresh whole blood in a membrane filter assay. The essential parameter was the percentage of PMN immigrating from the blood sample into the filters upon stimulation with the chemotactic peptide FMLP. ROS release was assessed in four L whole blood with Luminol-enhanced chemiluminescence upon PMA stimulation. Tests were made in triplicate (migration) or in duplicate (ROS) and with blank controls. Statistics: Correlations were calculated with the Spearman rank correlation test.

RESULTS. Altogether 102 pairs of measurements were made. Patients showed a negative correlation between PMN migration and ROS release: r = –0.4664, p = 0.0001. No significant correlation could be established for the healthy controls: r = -0.1835, p = 0.1283.

CONCLUSION. In patients with inflammatory stress, reduced PMN migratory capacity was associated with increased readiness to produce ROS. This suggests that PMNs may become more aggressive during a prolonged circulation period and may in turn cause damage to the organism.

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COMPARISON OF OXIDATIVE STRESS INDUCED BY SEPTIC SHOCK OR HEMORRHAGIC SHOCK

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INTRODUCTION. Oxidative stress induced by septic shock (SS) or hemorrhagic shock (HS) is not well characterized. The goal of our study was to compare in endothelial cells oxidative stress induced by serum of trauma patient with hemorrhagic shock or of patient with septic shock.

METHODS. After approval by institutional ethic committee blood samples were collected from trauma patient in HS and patient in SS after shock stabilization. Serum from healthy volunteer (HV) was also collected. After immediate centrifugation serum were stored at - 80°c. Fluorescent microscopy (DCFH fluorescent probe) was used to study radical oxygen species (ROS) production by perfused human umbilical vein endothelial cells (HUVEC) [Am J Respir Cell Mol Biol 2001; 24 : 762-768] .After one hour of stabilization HUVEC were perfused by patient serum during 20 minutes. Fluorescence variation of DCFH had been compared by ANOVA for repeated measures. In order to consider variation induced by haemodilution in HS patient, fluorescent values were related to blood protein level.

RESULTS. Significant production of reactive oxygen species was observed when HUVEC were exposed to SS serum patient (n=5) (SAPS II 57±31) or to HS serum patient (n=7) (ISS 39±18,SAPS II 44±21) instead of HUVEC exposed to serum of HV. This oxidative stress was comparable in both type of shock (Fig.1).

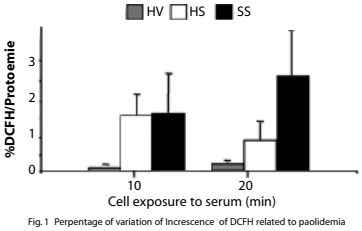

Fig.1 Perpentage of variation of Increscence of DCFH related to paolidemia

CONCLUSION. Oxidative stress induced by serum of patients in SS or HS is comparable. More patients are needed to confirm these results.

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INCREASED OXIDATIVE METABOLISM, PHAGOCYTOSIS AND APOPTOSIS IN HUMAN NEUTROPHILS FROM SEPTIC PATIENTS

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INTRODUCTION. Neutrophils play an important role in the pathogenesis of sepsis. Although they play a beneficial role in host immune defence, paradoxically they also have potential deleterious effects on normal host tissue. In this study, using flow cytometry analysis, we evaluated neutrophil activation in severe sepsis and septic shock by measuring its paghocytic ability and oxidative burst activity. We also focused on neutrophil apoptosis as a regulatory mechanism of the inflammatory response.

METHODS. Sixteen patients with severe sepsis and septic shock and sixteen healthy volunteers were considered. Neutrophil phagocytosis was evaluated by the detection of propidium iodide (PI) labelled *Staphylococcus aureus (S. aureus)* added to whole blood. Reactive oxygen species (ROS) formation was quantified by measuring the oxidation of 2',7' dichlorofluorescein diacetate (DCFH-DA) at baseline and after cell stimulation with phorbol myristate acetate (PMA), *S. aureus*, lipopolysaccharide (LPS) and N-formyl-methionyl-leucyl-phenylalanine (FMLP). Apoptosis was assessed in neutrophils stained with annexin V and PI, freshly isolated by Ficoll-Paque and Dextran sedimentation.

RESULTS. Neutrophil phagocytic ability was increased in septic patients compared to healthy controls (median GMFI was 101.9 and 54.7 respectively; P = 0.05). ROS formation was enhanced in septic patients compared to healthy volunteers at baseline (median GMFI 275.6 and 52.1 respectively; P<0.001), and after stimulation with *S. aureus* (median GMFI 2395.8 and 454.9; P<0.001), PMA (median GMFI 1120.6 and 307.5; P = 0.003), FMLP (median GMFI 792.4 and 123.2; P<0.001) and LPS (median GMFI 624.8 and 144.8; P<0.001). Early neutrophil apoptosis was increased in septic patients compared to healthy volunteers (median 11.3% and 9.1%; P = 0.03). Neutrophils from septic patients who survived (n=10) have a higher ROS generation than neutrophils from those who died (n=6) after stimulation with S. aureus and LPS (P = 0.01 and P = 0.03, respectively).

CONCLUSION. These data demonstrate that neutrophil function is enhanced in septic patients, denoting that these cells are up regulated by the ongoing septic event. Additionally, circulating neutrophils from septic patients presented with increased apoptosis, which may be a regulatory mechanism to minimize the deleterious effects of this cell activation. Poor prognosis would be associated with a lower neutrophil activation.

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EFFECT OF RADICAL SCAVENGER TEMPOL ON HEPATOSPLANCHNIC ENERGY BALANCE DURING SEPTIC SHOCK IN PIGS

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INTRODUCTION. Reactive oxygen species contribute to organ dysfunction in septic shock. Tempol, a membrane permeable radical scavenger, has proved beneficial in rodent models of endotoxic and Gram-positive shock (1). Here we investigate the role of Tempol during porcine long-term, hyperdynamic, Gram-negative septic shock.

METHODS. 12 h after induction of shock with continuous i.v. *Ps. aeruginosa* (PSAE) up to now 12 pigs received either no drug (PSAE; n=6) or Tempol (30 mg/kg/h;n=6). We measured mesenteric-, hepatic artery and portal venous blood flows (Doppler ultrasound flow probes), ileal microvascular perfusion (LDFgut, laser Doppler), ileal-arterial PCO2 gap (air tonometry) and liver lactate clearance (liv lac-clear).

RESULTS. Data are median and interquartile range, P<0.05. * vs. Preshock (ANOVA on Ranks); * Tempol vs PSAE (Mann-Whitney Rank Sum Test). Gut and liver macrocirculation did not differ between the groups.

		Baseline	12 hours	18 hours	24 hours
LDF gut	PSAE	27(23;28)	14(10;21)*	14(8;15)*	8(6;9)*
units/10	Tempol	22(20;27)	10(9;15)*	13(10;14)*	11(11;16)**
PCO2-gap	PSAE	15(14;20)	28(20;30)*	29(25;33)*	50(37;59)*
mmHg	Tempol	15(15;20)	17(16;23)	22(15;32)	25(18;29)*
Liv Lac-Clear	PSAE	13(13;19)	5(4;14)	6(0;9)*	0(-1;10)*
umol/min/kg	Tempol	10(8;16)	6(0;8)*	5(3;6)*	6(4;8)*

CONCLUSION. In this long-term model of bacteraemic shock tempol blunted sepsis-induced disturbances in gut microcirculation and the development of ileal mucosal acidosis, but failed to improve the impaired liver lactate metabolism.

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REDUCTION OF RENAL ISCHEMIA-REPERFUSION INJURY WITH PREVIOUS ADMINISTRATION OF LPS IN RATS

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INTRODUCTION. The administration of a low dose of endotoxin (LPS) can attenuate the inflammatory effects and prevent the mortality of a subsequent administration of high dosage of LPS. In this study the potential role of LPS pre-treatment on renal ischemia-reperfusion injury was evaluated in a rat model.

METHODS. 1 mg/kg of LPS (tolerant) or saline (control) was i.v. administered in 18 male Sprague-Dawley rats two days before experiment. Ischemic renal injury was provoked by 60 min left renal occlusive clamping associated with controlateral nephrectomy. Reperfusion, obtained by removing clamping was studied at T0 (immediate reperfusion), 2h (T1) and 24 h (T2). Plasma creatinin, renal tubular disorders (evaluated with semiquantitative histopathological scores in kidney samples), renal cytokine (IL-6, IL-10 and TNF-a), and NO productions were studied.

RESULTS. There was no difference between the two groups after renal ischemia (T0). Endodoxin tolerant group was associated with a significant decrease of creatinin levels at T2 (315 + 36 vs 231 + 28 mol/L; p<0;007). There was a significant reduction of renal histologic abnormalities, mainly at T1 (tubular damage, erythrocyte congestion, leukocyte infiltration and oedema). Renal IL-6 production was reduced and IL-10 production was significantly increased in tolerant animals at T1 and T2. There was no differences in TNFa and NO renal production.

CONCLUSION. In this study, we found that the administration of low doses of LPS to rats could protect these animals from renal reperfusion injury after 60 min ischemia. This protective effect can be mediated by IL-10 increased production which can induce in turn IL-6 production inhibition.

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PATHOPHYSIOLOGY OF EARLY ISCHAEMIA REPERFUSION INJURY OF THE COLON

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INTRODUCTION. Multiple Organ Dysfunction syndrome (MODS) is a cause of significant mortality in the critically ill patient. Ischaemia–reperfusion (I-R) of the gut is postulated as being causally associated with MODS [1].The aim of this study was to investigate, in man, the early processes associated with I-R, using the colon as the site of investigation.

METHODS. 20 patients undergoing aortic reconstruction were recruited. Mucosal biopsies of the sigmoid colon were obtained after induction of anaesthesia and within one hour of aortic clamp release. During surgery the inferior mesenteric vein was cannulated for sampling prior to and following aortic cross clamping. Splanchnic and peripheral blood was assayed intraoperatively for nitrosothiols and cytokines IL1beta, IL6 and TNFalpha.

RESULTS. The initial biopsies did not show any signs of inflammation nor any other abnormal histological changes. In the post surgery biopsies there was evidence of mast cell degranulation in the mucosa on staining for tryptase. There was no evidence of polymorph infiltration, acute inflammation or ischaemic changes. H & E staining showed a 3.5 fold rise in apoptotic bodies. Splanchnic blood showed a 4 fold increase in nitrosothiols and a 22 fold increase in IL6 within 15 minutes of reperfusion (p<0.05 Student's t-test).Peripheral blood showed a 5 fold increase in IL6 only.There were no changes in IL1alpha or TNFbeta.

CONCLUSION. Mast cell degranulation occurs early in colonic mucosa shortly after aortic clamp release.This precedes the inflammatory process and is associated with a significant increase in IL6 release from the splanchnic circulation consequent on ischaemia-reperfusion. This is accompanied by an increase in nitrosothiols which are donors of nitric oxide. These effects in the spanchnic circulation precede systemic changes. We identify apoptosis, rather than necrosis, as the principal mode of cell death in early IR injury. Further elucidation of this process may identify targets for pharmaceutical prevention of IR mediated injury.

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PROINFLAMMATORY CYTOKINE RELEASE UNDER TWO ANESTHESIA TECHNIQUES

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INTRODUCTION. The goal of study was to asses the influence of two kinds of anesthesia techniques(Epidural vs. General)on the release of proinflammatory cytokines and postoperative complications(1)

METHODS. We study in a prospective, aleatory randomized way 20 patients, scheduled for abdominal hysterectomy without exclusion criteria.Two groups were settled: Epidural Anesthesia Group(Group E)and Balanced General Anesthesia(Group G),both performed under current protocol. Blood samples were drawn to determinate levels of IL6,TNF-alfa,CRP,and fibrinogen at times:T0(just before anesthesia),T1(6 hours after the intervention),T2(3rd postoperative day),T3(6th postoperative day).The following postoperative complications were evaluated: temperature e>38ºC, pain(VAS>7),clinical infection, arterial hypotension(SAP<90mmHg), hemorrhage>500 ml during the first 48 hours and delayed hospital discharge. U Mann-Withney and Friedman test were Used.

RESULTS. Significant differences along the time for IL-6,CRP and Fibrinogen in each group (Table 1) and no significant differences between groups for TNF-alfa,IL-6,CRP,fibrinogen and postoperative complications were found.

	T0	T1	T2	T3	Friedman (p)
TNF (Group E)	2.29+/- 0.92	2.00 +/- 0.00	3.24 +/- 2.09	2.00 +/- 0.00	NS
TNF (Group G)	2.45 +/- 1.42	2.00 +/- 0.00	2.54 +/- 1.71	2.25 +/- 0.79	NS
IL-6(Group E)	2.50 +/- 0.00	17.38 +/- 9.29	9.32 +/- 15.76	3.23 +/- 2.31	< 0.0005
IL-6 (Group G)	2.50 +/- 0.00	9.48 +/- 9.70	2.50 +/- 0.00	3.06 +/- 1.77	0.003
CRP (Group E)	7.20 +/- 13.08	7.90 +/- 10.38	88.00 +/- 64.88	49.40 +/- 57.37	< 0.0005
CRP (Group G)	2.80 +/- 1.93	6.80 +/- 4.16	67.90 +/- 26.61	29.50 +/- 33.71	<0.0005
Fib. (Group E)	354.10 +/- 67.21	300.50 +/- 32.96	582.70 +/-114.50	586.80 +/- 94.02	< 0.0005
Fib. (Group G)	343.00 +/- 58.82	323.10 +/- 56.89	616.10 +/- 43.55	510.80 +/-108.54	< 0.0005

TNF (pg/ml), IL6(pg/ml), c-Reative Protein -CRP-(mg/dl), Fibrinogen (mg/dl)

CONCLUSION. 1.-Postoperative cytokines release are independent on anesthesia technique(general vs epidural).2.-Increased cytokines level were not correlated with postoperative complications.

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IMMATURE GRANULOCYTES, IMMATURE MYELOID CELLS AND OUTCOME IN ADULT SEVERE SEPSIS

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INTRODUCTION. During severe systemic infection leukocytosis is present because of an increase in leukocyte production and release by the activated bone marrow. The presence of immature granulocytes (IG) in peripheral blood has been shown to be indicative for sepsis in neonates and is positively correlated with mortality. As shown in this study the number of immature myeloid cells, normally not present in peripheral blood, as displayed by the immature myeloid information (IMI) may correlate with the outcome of adult ICU patients with severe sepsis and septic shock.

METHODS. In 29 consecutive adult patients (8 F, 21 M) of two operative ICUs the number of IG and the immature myeloid information (IMI) was studied daily using a SYSMEX XE-2100 in conjunction with determination of markers of severity and inflammation after obtaining informed consent. All patients fulfilled the ACCP/SCCM criteria for severe sepsis and septic shock, respectively, with the onset of sepsis being defined as day one. Observation period was 14 d, all patients received standard intensive care, and the attending physicians were blinded to the haematological results.

RESULTS. Median age was 58 (21-73) y, median APACHE II was 18 (9-31), ICU-Mortality was 8/21 (38%). On day one, there were significant correlations between IG count, IMI, APACHE II and ICU mortality (p<0.05). IMI was also positively correlated with LBP, PCT, CRP and APACHE II score on day one (p<0.02). Moreover, IMI channel values were consistently elevated in non-survivors throughout the observation period. ROC analysis showed good sensitivity and specificity concerning mortality.

CONCLUSION. These preliminary data demonstrate that during the early phase in human adult sepsis there is a distinctive recruitment of immature granulocytes ("alarm reaction") from the bone marrow which can be detected by an automated haematology analyzer. Both IG count and IMI channel are significantly correlated with ICU mortality and severity. The questions regarding clinical utility and predictive power of these new parameters deserve further examination.
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MODULATION OF MEMBRANE AND SOLUBLE TNF-ALPHA OF BLOOD AND PERITONEAL NEUTROPHILS DURING PERITONITIS

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INTRODUCTION. Both membrane-bound (mbTNF-alpha) and soluble (solTNF-alpha) tumour necrosis factor can induce similar inflammatory responses. TNF-alpha converting enzyme (TACE) is a metalloprotease involved in the cleavage of the solTNF-alpha from the mbTNF-alpha. These three TNF-related parameters have never been studied during severe sepsis and might be involved in phagocyte activation.

METHODS. We studied 29 patients suffering from peritonitis with severe sepsis. During laparotomy, blood and peritoneal fluid were sampled. MbTNF-alpha and TACE expression on neutrophils (PMN) were studied using flow cytometry (results expressed as median of fluorescence intensity (MFI)). SolTNF-alpha was assayed by ELISA in plasma, peritoneal fluid and supernatants of cultured PMN isolated from blood and peritoneum (basal and ex vivo LPS + INF-gamma stimulation). Control values were obtained from blood PMN of 12 healthy volunteers. Results were expressed as mean ± SE. A Mann-Withney test and a Wilcoxon test were used to compare septic and control group (*p<0.05 vs control) and peritoneal and autologous blood in patients (*p<0.05 vs autologous blood PMN) respectively.

RESULTS. Mean SAPS II and SOFA were 44 ± 3 and 7 ± 1 respectively. PMN from patients were activated at basal state in both compartments. A decreased capacity of TNF-alpha production by stimulated PMN was observed and was more pronounced in the peritoneal compartment, suggesting a deactivation of peritoneal PMN.

	sol TNF (pg/ml)	mb TNF (pg/ml)	sol TNF in Basal	supernatants LPS-INFgamma	mb TACE (MFI)
Control Patients	non detected	52 ± 4	66 ± 18	1607 ± 238	16 ± 1
Blood	26 ± 4 *	24 ± 4 *	50 ± 5	343 ± 46*	59 ± 8*
Peritoneum	223 ± 87 **	33 ± 7 **	33 ± 7 *	233 ± 63 **	101 ± 7**

CONCLUSION. During sepsis, the mTNF-alpha cleavage by TACE on PMN seems to be dysregulated. The impact of this peritoneal PMN deactivation on sepsis resolution needs to be explored.

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COMPARING LEVEL OF CONSCIOUSNESS SCALES: ACDU AND AVPU WITH THE GCS.

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INTRODUCTION. Early warning scores (EWSs) may identify impending critical illness. Level of consciousness (LOC) assessment forms part of an EWS. Some EWSs avoid the Glasgow Coma Scale (GCS) [1] to assess LOC as it must be applied correctly. AVPU (Alert, responds to Voice/Pain, Unresponsive), allowing basic LOC assessment, is an alternative. It has been compared with the GCS, [2] but was not developed for EWSs and may not detect early falls in LOC. Our EWS uses 'confused' as an additional descriptor to overcome this. We investigated the relationship of ACDU (Alert, Confused, Drowsy, Unresponsive) and AVPU (see our abstract titled *Do A,C,D and U Describe Different Levels Of Consciousness?)*

METHODS. We asked neurosurgical nurses to record AVPU, ACDU and GCS scores every time they assessed LOC. Each time staff preference of ACDU or AVPU was sought. No training was given in ACDU use, staff were encouraged to use their own judgement. Analysis used the Kruskal-Wallis (with Dunn's comparisons) and Mann-Whitney tests (Prism 4.0).

RESULTS. We collected 1072 observations; 999 graded AVPU, ACDU and GCS; 20 compared ACDU and GCS, 53 were excluded. Median GCSs of like groups (Alert/Alert, Confused/Voice etc) were significantly different, p<0.001. ACDU had higher median GCSs except in the Alert category. Preferred scale (399 responses): 43% preferred ACDU, 57% AVPU. The GCS was higher in the chosen ACDU group, median 14, (IQR 13-14) than in the chosen AVPU group (median 10 (8-14)) p<0.0001. In the table: n, number of observations; Median, median GCS of the category; IQR inter quartile range; 95% value, 5th percentile.

	A/ACDU	A/AVPU	C/ACDU	V/AVPU	D/ACDU	P/AVPU	U/ACDU	U/AVPU
n	192	103	266	441	140	88	121	67
median GCS	15	15	13	13	10	8	6	6
IQR	14–15	15–15	13–15	10–14	9–11	7–9	6–9	5–7
96% value	11	12	10	9	8	5	3	3

CONCLUSION. Confused and Drowsy select a higher median GCS than responds to Voice or to Pain. ACDU is a purely observational scale requiring no standardised stimulus. Further work is required to integrate these findings into EWSs.

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OUTCOME IN VENTILATED PATIENTS WITH A HEMATOLOGIC MALIGNANCY AND IMPACT OF NONINVASIVE VENTILATION

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INTRODUCTION. Survival of critically ill patients with a haematologic malignancy requiring mechanical ventilation (MV) has improved, part of which has been attributed to the use of non-invasive MV (NIMV) (1).

METHODS. We retrospectively collected variables in 166 consecutive patients with a haematologic malignancy admitted to our intensive care unit (ICU) and requiring MV, and identified factors obtained within 48 hours of ICU admission affecting in-hospital mortality in univariate and multivariate stepwise logistic regression analysis. We assessed whether NIMV offered a protective effect using a pair-wise matched exposed-unexposed analysis.

RESULTS. Mean SAPS II score was 59. Ninety-three (56.1%) patients had a high-grade malignancy, which was acute myelogenous leukaemia (AML) in 44 (26.5%) patients. A recent bacteraemia (defined as positive blood cultures within 48 hours of ICU admission) precipitating ICU admission was present in 29 patients (18%). In-hospital mortality was 70.5%. In a multivariate logistic regression analysis, in-hospital mortality was predicted by increasing severity-of-illness, as measured by the SAPS II score (odds ratio (OR) per point increase 1.08; 95% confidence interval (CI) 1.04-1.13) and a diagnosis of AML (OR 3.1; 95% CI 1.1 -8.7). Three variables were independently associated with a protective effect: female sex (OR 0.35; 95% CI 0.15-0.83), intubation within 24 hours of admission (OR 0.28; 95% CI 0.1-0.78) and recent bacteraemia (OR 0.18; 95% CI 0.06-0.52). Twenty-seven patients who received NIMV as an initial mode of MV were matched for SAPS II score (±3) with 52 patients who required immediate intubation. In-hospital mortality was 65% in both groups (OR 1; 95% CI 0.5-1.9)).

CONCLUSION. Although in-hospital mortality in ventilated patients with a haematologic malignancy remains high, reluctance to start MV in this population is unjustified, especially when bacteraemia has precipitated ICU admission. The use of NIMV had no impact on mortality in our population.

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DELIRIUM AND AGITATION IN ICU EDERLY PATIENTS

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INTRODUCTION. Delirium is the most commonly encountered mental disturbance in elderly critical ill patients. It may be precipited by diferents factors and is associated with more morbidity.

METHODS. A prospective study that included 140 patients aged 70 years or older who had been admitted to the polyvalent ICU. We studied: age, sex, previous history, reason for admission, mechanical ventilation, days in ICU, agitation, delirium (first symptom), outcome.

RESULTS. 72 patients were female (51%) and 68 were male, the mean age were 76 (range 70-92), and APACHE II were 12+/-6. Delirium (according to DSM-IV criteria)develops in 28 (20%), and agitation (without other delirium criteria)in 13 (9%): In the delirium group: 71% were female, with mean age of 79+/-13; and in the agitation group:76% were male with mean age of 78+/-12. In the delirium group: benzodiazepines ingestion was the only previous factor with statistical significant relationship; days in ICU 3.5 (total group 3.2), no different mechanical ventilation time. There weren't any statistical significant relationships in the different reason for admission. The first symptom was at 8.6 hours (1-24). Outcome agitation occurred in 60% of agitation group and 29% of delirium group.

CONCLUSION. Age, female sex and benzodiazepines were risk factors of delirium in our study. In order to prevention, is necessary early recognition (first symptom were in the first 24 hours) and treatment to the risk group.

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IMPACT OF A RESTRICTIVE STRATEGY OF RED-BLOOD CELL TRANSFUSION IN ICU

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INTRODUCTION. A restrictive strategy of red blood cell (RBC) transfusion (triggered by an haemoglobin < 7 g/dl) could decrease the requirement of RBC packs compared to a liberal strategy (haemoglobin level < 10 g/dl)(1). The present study aimed to evaluate the impact of a restrictive strategy compared to the previous one (haemoglobin < 8 g/dl)(2).

METHODS. From the RBC command sheets, 1997-1998 and 1999-2001 periods were compared according to the following parameters: number of admissions, the rate of transfused patients, the number of RBC packs transfused per patient (/pt) and haemoglobin level before RBC transfusion. ANOVA, Student-Newman-Keuls or a Kruskal-Wallis test Bonferoni's correction were used. p<0.05 was significant (*).

RESULTS. 474 of 1787 admitted patients were transfused from 1997 to 2001. The haemoglobin levels before the transfusion were smaller since 1999 (p < 0.01) but the rate of transfused patients and the number of transfused RBC packs/patient were not altered since 1999 (table).

Measured parameters from 1997 to 2001

years	1997	1998	1999	2000	2001
Admissions	438	356	344	271	379
transfused pts (rate in %)	106 (24%)	109 (31%)	80 (24%)	83 (31%)	84 (22%)
RBCpacks/pt	4 [1-23]	4 [1-32]	5 [2-23]	6 [2-31]	4 [1-26]
hemoglobin (g/dl)	7.7 +/- 1.2	7.7 +/- 1.5	7.1 +/- 1.1 *	6.9 +/- 1.3 *	7.3+/- 0.9 *

RBC/pt in median with 5 and 95 percentiles. Hemoglobin level in mean with SD.

CONCLUSION. A restrictive strategy allows to decrease the haemoglobin level triggering RBc transfusion. However it did not allow decreasing the rate of transfused patients when classical blood transfusion recommendation were previously applied.

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2) Goodnough et al. N Engl J Med 1999;340: 438-447

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DISSEMINATED INTRAVASCULAR COAGULATION IN PATIENTS WITH SEVERE SEPSIS: COMPARING CURRENT DEFINITIONS

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INTRODUCTION. Though most physicians recognize the clinical picture of disseminated intravascular coagulation (DIC), no clear consensus on a definition or systematic scoring system exists. Proposed scoring systems include: the Japanese Ministry of Health and Welfare (JMHW) and the International Society on Thrombosis and Haemostasis (ISTH) systems. Both systems use laboratory values to assign points toward a score that classifies DIC in patients. Because sepsis is the most common aetiology of DIC, the purpose of this study was to use the large (N=1690), well-defined population of patients from PROWESS to compare these 2 scoring systems. PROWESS was a phase 3, placebo-controlled, international trial that evaluated the treatment effect of drotrecogin alfa (activated) in patients with severe sepsis.

METHODS. JMHW and ISTH definitions were retrospectively applied to the PROWESS database. DIC status was determined at study entry and baseline characteristics were compared between patient groups with and without DIC using chi-square and Wilcoxon rank-sum tests. Patients were classified using the JMHW definition of DIC (>or=7 points) and the ISTH definition of overt DIC (>or=5 points) and the extent of agreement calculated. A receiver-operating curve (ROC) was constructed to predict the JMHW DIC classification using the ISTH DIC scale.

RESULTS. At baseline, 24.9% (420/1690) and 26.9% (454/1690) of PROWESS patients met the JMHW DIC and ISTH overt DIC definitions, respectively. Baseline characteristics of patients with DIC were very similar with both definitions. Patients classified according to JMHW DIC and ISTH overt DIC corresponded 89% of the time. Analysis using an ROC curve showed that a cut-off of 5 points on the ISTH overt DIC scale yielded the best combination of sensitivity (82%) and specificity (91%) for JMHW DIC (>or= 7 points). The area under the curve was 0.94.

CONCLUSION. Close to 25% of patients with severe sepsis had DIC using either the JMHW (24.9%) or the ISTH (26.9%) scoring systems. The ISTH cutoff of >or= 5 points for overt DIC classification corresponded very closely to the JMHW DIC cutoff of >or= 7 points. The ability of the JMHW DIC and ISTH overt DIC definitions to identify patients with DIC was remarkably similar.

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HOW PREVALENT IS ANAEMIA AFTER I CU DISCHARGE: A PROSPECTIVE SINGLE CENTRE COHORT STUDY?

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INTRODUCTION. There are few data describing anaemia and red cell transfusion after Intensive Care Unit (ICU) discharge. We aimed to measure the prevalence of anaemia during recovery from critical illness and to describe transfusion practice in patients after ICU discharge.

METHODS. We studied all admissions over 100 days to our 12-bed teaching ICU. We prospectively collected daily haemoglobin (Hb) and transfusion data between ICU discharge and hospital discharge or death.

RESULTS. There were 185 ICU admissions during the study period. 62 patients died in ICU, 11 were discharged home or transferred to other hospitals. 112 patients were discharged to sites in our hospital; of these 12 had no Hb testing after ICU. One hundred patients had at least one post-ICU haemoglobin test. For these patients, mean (SD) age was 55.4 (16.5) years; 54% were male. Median (quartiles, range) last Hb in ICU was 94 (83,110; 63-151) g/L. Each patient's post-ICU Hb results were averaged, the median of these values was 104 (94, 115; 76-153.5). 43% of patients had a mean post-ICU Hb<100g/L and 14%<90g/L. 21% of patients received red cell transfusion after ICU discharge, comprising a total of 42 transfusion events (99 units). The median pre-transfusion Hb was 74 (68, 76; 49-111) g/L. Last recorded Hb in hospital was 108 (95, 121; 76-154) g/L. 73% of patients had a last Hb less than reference range (M<130g/L; F<115g/L); 32%<100g/L; and 17%<90 g/L.

CONCLUSION. Anaemia was prevalent after ICU discharge and persisted until hospital discharge or death. Clinicians used conservative transfusion triggers after ICU discharge.

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OUTCOME OF ELDERLY PATIENTS IN AN INTERMEDIATE CARE AREA (ICA)

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INTRODUCTION. More and more elderly patients are being attended at Intermediate Care Areas. Some studies in critical care units indicate that increasing age predicts worse outcome, whereas others show that severity of illness at admission is a better prognostic indicator. However, only a few studies have compared patients in different age groups with a similar severity of illness, and, to our knowledge, there are no studies adressing this subject in ICAs. In this study, characteristics, outcomes and outputs in various age groups of elderly patients admitted to an ICA were analysed.

METHODS. From a total of 1696 patients admitted to our hospital's ICA in 2000, we prospectively studied 247. APACHEII, TISS28, previous Barthel Index(I), Charlson I, diagnosis, length of stay, outcome, and discharge disposition were recorded. We analysed differences between 4 groups:<65, 65-74, 75-84, and >or=85 years. Multiple logistic regression was used to analyse outcomes and outputs.

RESULTS. 78 patients were<65(50.6±12.4), and 169 >or=65 years (76.1±6.4). No significant differences between the 4 groups were observed in sex (66% males), Charlson I (2.5±1.9), TISS28 (20.3±8.2), or diagnosis. Statistically significant differences were seen in Barthel I (92±22 vs. 90.8±16.5 vs.84.9±24.2 vs.70.5±34.5), and APACHEII (10.7±6 vs.14.1±6.5 vs.15.4±5.7 vs.15.7±6.4) (p<.01). Nevertheless, if we eliminate age points from APACHE II the differences were not significant (p=.862). The most frequent diagnoses were acute coronary syndrome (26%)and congestive heart failure(14%). No differences were observed in ICA or in-hospital length of stay (4±7.2/16,7±18.5 d). Neither were there differences in ICA, in-hospital mortality(7.3/14%),or long-term care disposition at discharge(6%). The only independent predictor for ICA mortality was APACHEII (OR=1.18;95%CI1.09-1.27;p<.01), and TISS28 for in-hospital mortality (OR=1.10;95%CI1.06-1.15;p<.01). Barthel I was the only independent predictor for long-term care placement at discharge OR=0.97;95%CI0.95-0.99;p<.01).

CONCLUSION. Patients characteristics at admission were similar between age groups, except for Barthel I/ No significant differences were observed in outcomes and outputs between elder and younger patients/ Predictors for ICA and in-hospital mortality were APACHE II and TISS28, whereas the predictor for long-term care placement at discharge was Barthel I/ Age alone is not a predictor of poor outcome in an ICA.

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PERFORATION OF THE DIGESTIVE TRACT WITH ABDOMINAL INFECTION: COMPARISON OF ICUS

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INTRODUCTION. Treatment of abdominal infection, due to a perforated gut may differ between hospitals. We hypothesised that this situation may result in differences in outcome. We used data from The Dutch National Intensive Care Evaluation (NICE) registry, which contains data of all ICU admissions from an increasing number of ICUs (at present, more than 70,000 patient records), to analyse the magnitude and outcome of this particular problem.

METHODS. We analysed the data from 22 ICUs from 1996 to 2003. Some centres started later than others and thus had fewer patients in the database. We included patients with the surgical APACHE II diagnosis perforation or obstruction. In addition, we used confirmed infection on admission (collected for MPM 0) to differentiate between perforation and obstruction. Four ICUs did not have any patient registered with these inclusion criteria. We used the mean or median values where appropriate.

RESULTS. From 18 ICUs 542 patients met the inclusion criteria (range 1-103 patients per ICU). The mean age per ICU ranged from 55.6 to 73.6 years. 84% of all the patients were mechanically ventilated, range 0-100%. 19% of the patients were re-admissions to the ICU, range 0-25%. Chronic diagnoses were frequently present (among others: 12% metastatic neoplasm, 6.6% renal failure). In 4 ICUs, the included patients showed a significantly lower mean thrombocyte count on admission compared to the mean of all the ICU's, the others did not. Other physiological parameters did not show significant differences between ICU's. Mean APACHE II was 18.3 (SD 1.8; range 15 to 22.8) with a predicted mortality of 40% (SD 6%). ICU mortality ranged from 0 to 60%, mean 24%. Hospital mortality was 37% (range 0-100%). Overall the SMR was 0.90 (95% CI interval 0.77-1.04). The ICU with the lowest SMR was 0.54 (95%CI 0.10-1.6), the highest was 1.36 (95%CI 0.64-2.5). Median time of ICU treatment was 5.4 days (range 0.3 – 16). Hospital efficiency (the number of days treated in the hospital to produce one survivor) ranged from 30 to 122. ICU efficiency ranged from 5.0 to 19 days.

CONCLUSION. Abdominal infection due to perforation of the digestive tract leads to substantial morbidity, ICU usage and mortality. The ICUs differ substantially in duration of treatment, mortality and efficiency. Further research is necessary to explain these differences.

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POST-TRAUMATIC SEVERE DISSEMINATED INTRAVASCULAR COAGULATION DOES NOT PRECLUDE MULTIORGAN DONATION

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INTRODUCTION. Patients who develop disseminated intravascular coagulation (DIC) are usually considered as marginal donors. The aim of our study was to evaluate the incidence of DIC, in potential organ donors who developed brain death after severe head injury, and to assess the implication of this disorder on the development of complications after multiorgan donation.

METHODS. Prospective and descriptive study, performed from January-1995 to December-2002, on severe head injury patients, that developed severe DIC, and their organs were procured to be implanted. Severe DIC was defined as: prothrombin activity (PA) < 50%, prolonged activated partial thromboplastin time (APTT) > twofold the control, fibrinogen (FB) < 100 mg/dl, high levels of D-Dimer (DD), and platelets count < 100000/mm3. Demographic and analytical data, transfusion requirements, length of stay in ICU and the subsequent evolution of all the harvested organs were evaluated. (Data expressed as mean ± SD).

RESULTS. In the study period there were 109 donors, 31 died because of severe head injury. Eight (26%) meet criteria for severe DIC. Their mean age was 29±7 years (range: 21-41); 7 were males. On admission, Glasgow Coma Score was three in six patients and three of them met brain death criteria after neurological examination. Two patients suffered from cardiopulmonary arrest secondary to hemorrhagic shock, both with a fast recovery after resuscitation manoeuvres. Five were submitted to an emergency craniectomy. Coagulation tests on admission were: PA 24±14 %, APTT 112±58 seconds, FB 65±34 mg/dl, DD 71±89 mg/ml and platelets count 88000±44000/mm3. Mean transfusion requirements per patient were: fresh frozen plasma 1200±750 ml, packed red cells 2050±1300 ml, platelet units 7±3 and intravenous FB was administered in 3 patients. Brain death was documented at 17±20 h (range, 0-59 h) from admission to ICU. Concerning the harvesting, 16 kidneys, 8 livers, 6 hearts and 3 lungs were procured to be implanted, and all of them with satisfactory function after implantation.

CONCLUSION. In our series, 26% of brain dead organ donors, caused by severe head injury, developed severe DIC. Organ implantation from these donors with post-traumatic severe DIC was satisfactory. This suggests that severe DIC might not preclude multiorgan donation.

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QUALITY OF LIFE IN PATIENTS WITH ACUTE RESPIRATORY FAILURE AFTER CARDIAC SURGERY

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INTRODUCTION. Health-related quality of life (HRQOL) seems to improve following coronary artery by-pass graft (CABG) and valve replacement, in particular for patients with pre-operative deficit. Acute respiratory insufficiency (IRA) is a rare complication after cardiac surgery and the main causes are infections, respiratory muscle deficits, ARDS (1). The objective of the present study is to asses the QOL at least one year after cardiac surgery complicated with IRA requiring protracted intensive care.

METHODS. This prospective cohort study was carried out on patients admitted to a polyvalent sixteen beds intensive care unit (ICU) of a University teaching Hospital, because of IRA developing after cardiac surgery and who were discharged alive from 1999 to 2001. All patients received mechanical ventilation for more than 5 days during their ICU stay. EuroQoL-5D questionnaire, as well as Dyspnea Test, was administered to survivors by telephone by the same clinician one year after ICU admission. Patients with completely uncomplicated post-operative course were matched to the study group with respect to gender, age and type of surgery.

RESULTS. Of forty-one patients admitted to the ICU for IRA post-CABG, twenty-two (53.6%) were discharged alive from Hospital. Sixteen of them (39%) were still alive at the follow-up and were interviewed. Aetiologies of IRA were: phrenic nerve injury (38.8%), pulmonary infection (27.7%), pleural effusion (27.7%) and ARDS (5.5%). At time of interview self perceived QOL, measured with health status and EQ visual analogue scale was worse compared with pre-hospital admission. Moderate and extreme problems in the mobility, self-care and activity dimensions studied were present, while no problems to moderate in the pain and anxiety ones. Moreover overall QOL was significantly worse than in the reference control group population. Physical functions appear to be related to respiratory impairment.

CONCLUSION. In this preliminary report, long-term outcome after ICU admission for IRA post cardiac surgery seems to be poor. Survivors have persistent functional disability one year after ICU discharge. Most of them have pulmonary conditions, with respiratory muscle weakness being most prominent.

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HAEMATOLOGICAL MALIGNANCY IN INTENSIVE CARE: A NATIONAL DATABASE COMPARED WITH A SINGLE CENTRE

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INTRODUCTION. The outcome from haematological malignancy in patients who are admitted to Intensive Care is often derived from specialist centres where outcome may be improving(1). Outcome data is however lacking from large databases and non specialist centres, where the outcome may be very different.

METHODS. The Intensive Care National Audit and Research Centre case mix programme database (ICNARC CMPD) collected data from 128 intensive care units across England, Wales and Northern Ireland between December 1995 and August 2001. All admissions to the ICNARC CMPD who had a 'past medical history present' in acute myeloid leukaemia, acute lymphocytic leukaemia, multiple myeloma, chronic myelogenous leukaemia, chronic lymphocytic leukaemia or lymphoma were selected for analysis. The ICNARC CMPD was then compared with data submitted from the Bristol Royal Infirmary (BRI).

RESULTS. 57 admissions were identified from the BRI with a further 1377 identified from the ICNARC CMPD. Admissions with haematological malignancy at the BRI had significantly higher acute physiology scores ($p<0.001$ by t test)and APACHE II scores ($p<0.001$ by t test) compared with the ICNARC CMPD. Despite this the mortality at the BRI was not increased ($p=0.83$ chi squared test).

	CMPD (n=1377)	BRI (n=57)
Mean age (SD)	53.2 (20.3)	50.2 (17.7)
Mean acute physiology score (SD)	16.2 (7.4)	21.8 (9.0)
Mean APACHE II score (SD)	24.1 (7.8)	28.9 (9.3)
Median APACHE II probability	0.48	0.62
Unit mortality	44.1%	52%
Hospital mortality	58.5%	60%
Mean unit length of stay (median) hours	121.3 (46.8)	78.4 (44)
Mean hospital length of stay (median)days	26.3 (16)	20.0 (12)

CONCLUSION. Outcome studies based on data from a single centre may not give reliable outcome data for patients admitted with haematological malignancy to non-specialist centres.

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MORBIDITY AND MORTALITY AFTER PERCUTANEOUS TRACHEOSTOMY

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INTRODUCTION. Percutaneous tracheostomy(PT) is performed easily in the ICU and is becoming more common. We were interested in the fate of patients who received tracheostomy in the ICU and ,for survivors, in the wards in terms of their outcomes, need for ventilation, and length of stay, in ICU and the hospital as compared to patients admitted to ICU who did not have a tracheostomy.

METHODS. Examination of clinical database in a district general hospital for the calendar years 1999 - 2001 together with retrospective notes review of those patients who had tracheostomy. Our unit is a mixed ICU/HDU which changed during the period of study from 9 ICU/4 HDU beds to 9 ICU/6HDU/3 NeuroICU beds.

RESULTS. 156 PT were performed in 3690 admissions(4.2%). PT was performed after 7 days of ventilation (median, range 0-34) for unit survivors(S) and 8.5 (0-18) for non survivors (NS) who received S 4 (0-40), NS 14.5(2-31)days of ventilation after PC. Time to decannulation was 21 (3-75) days. S stayed in hospital 28(0-225)days after ICU discharge. ICU stay for S was 16 days, NS 21 (median LOS for all patients 1 day).ICU mortality was 15.3% after PT (16.1% for all patients)and hospital mortality 29.5% after PT compared to 24.6% for the whole population. Complications were recorded at insertion for 22 patients(14%)and 88 patients(56%) grew MRSA at some point.

CONCLUSION. PT is a common and safe procedure which patients do well after. They have long ICU and hospital stays but a fair outcome in terms of hospital survival to discharge. The presence of such dependent patients in the hospital for long periods of time has serious resource implication for not only doctors and nurses but also physiotherapists, dieticians and speech and language therapists.

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THE EFFECT ON HOSPITAL MORTALITY OF DELAYED REFERRAL OF WARD PATIENTS TO ICU

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INTRODUCTION. We present the results of an outcome assessment of all patients admitted to our critical care area (ICU and HDU) from hospital wards over a three-month period. In particular, we assessed those patients who triggered our early warning indicator (EWI) and the effect of a delay of referral of triggering patients on hospital mortality. The assessment was then repeated over the same three-month period one year later.

METHODS. We retrospectively examined the notes of each patient after admission to the critical care area. From the data recorded in the notes we ascertained which patients triggered our EWI on the ward and whether a delay occurred in referral of these patients to the critical care team. Our definition of a delay was a referral made more than 4 hours after a patient had triggered the EWI (or 6 hours if the trigger was oliguria).

RESULTS. A total of 138 patients triggered our EWI in the two 3-month periods and were included in the analysis. The following conclusions were made from the data:
1. There was a significant increase in hospital mortality in patients referred to ICU (but not HDU) after a delay, compared to those who were referred early (Table 1).
2. There was no difference in the age or APACHE II scores of patients between these 2 ICU groups.

Inpatient outcomes in 138 ward patients who triggered our EWI

	ICU (Prompt)	ICU (Delay)	HDU (Prompt)	HDU (Delay)
Number of Deaths (%)	4 (18.2)*	13 (56.5)*	24 (42.1)	18 (50)

**P<0.05*

CONCLUSION. Suboptimal care of patients on hospital wards before admission to ICU can be associated with a deleterious effect on outcome (1). Our EWI is straightforward in that only one criterion must be met before the primary medical or surgical team is contacted. We believe that such early involvement creates a tool with high sensitivity and specificity. We believe that the data produced in this study provides evidence of how an Outreach system can improve outcome.

REFERENCE(S). 1. McQuillan P et al (1998) Confidential enquiry into quality of care before admission to intensive care Br Med J 316: 1853-1858

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THE EFFECT OF OBESITY ON OUTCOME FOLLOWING ADMISSION TO INTENSIVE CARE (ICU)

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INTRODUCTION. The effect of obesity on outcome after ICU admission is unclear. This prospective study examined the relationship between ICU admission body weight and index (BMI) and various clinical outcomes in critically ill patients.

METHODS. Consecutive patients admitted to a mixed, adult ICU were enrolled. Admission data included patient demographics, Charlson Comorbidity score (CCS) and pre-admission albumin. BMI (kg/m^2) was calculated from ICU admission height (m) and measured weight (kg), using the PROMED weighing device or premorbid weight (documented in previous month) when measurement not performed due to cardio-respiratory instability. Estimated weight (mean of 5 independent medical/nursing staff estimates) was also determined. Predictive models for ICU, hospital and 6 month mortality were generated using logistic regression with covariate selection determined by penalised likelihood. Non-linear effects (continuous covariates) and first order interactions were explored. Model adequacy was assessed by ROC curve area (Az) and Hosmer-Lemeshow C-statistic (C).

RESULTS. Four hundred and fifty eight patients (58% male; 61% medical), mean (SD) age 62.7(17.7) years, APACHE II score 20.8(8.4) and risk of death 0.42(0.29) were enrolled. Measured weight and BMI were 79.1(22.2) kg and 27.8(7.2) kg/m^2 respectively; in 17%, weight > 100 kg, in 30%, BMI > 30 kg/m^2. Estimated weight was 78.7(18.0) kg and Lin's concordance correlation coefficient was 0.92; average difference -0.21 kg; 95% limits of agreement -15.7 to 15.3 kg. ICU, hospital and 6 month mortality were 15.7%, 26.4% and 46.6% respectively. Predictive models and covariates (OR (SE); np, not predictive) and performance indices are shown (Table 1). Weight and APACHE II score were linear in effect and no significant interactions were demonstrated. BMI was predictive of 6 month (OR 0.94 (0.24)), but not ICU or hospital, mortality.

Mortality	Sex (m/f)	APACHE	Vent (y/n)	CCS	Weight (kg)	Az	C, p value
ICU	0.53(0.20)	1.20(0.03)	3.70(2.89)	np	0.98(0.01)	0.88	0.57
Hospital	np	1.14(0.02)	np	np	0.98(0.01)	0.81	0.80
6 month	np	1.12(0.25)	np	1.28(0.11)	0.98(0.01)	0.82	0.07

CONCLUSION. Obesity is not associated with poor outcomes in critically ill patients.

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REASONS FOR THE TRANSFER OF CRITICALLY ILL PATIENTS IN THE WEST OF SCOTLAND

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INTRODUCTION. We aimed to determine the reasons for the interhospital transfer of critically ill patients within the West of Scotland by our specialist transfer team.

METHODS. A retrospective analysis of the Clinical Shock Study Group Database was performed for a three-year period 1999 to 2001.

RESULTS. During the three-year period 1386 patients were transferred by air or road. The reasons for patient transfer were categorized as: 1) BEDSPACE - no immediately available staffed ITU beds in referral hospital. 2) GENERAL UPGRADE - transfer to an ITU able to provide renal replacement or burns therapies, or from a site with High Dependency Unit and no ITU. 3) SPECIALIST UPGRADE - transfer to a specialist ITU (neurosurgical, cardiac or liver unit). 4) DIAGNOSTIC - transfer of patient requiring diagnostic services i.e MRI. The number of transfers performed in each category is illustrated in Table 1.

Reasons for transfer	Numbers (%) of transfers
BEDSPACE	697(50.3%)
GENERAL UPGRADE	436 (31.4%)
SPECIALIST UPGRADE	234 (16.9%)
DIAGNOSTIC	19 (1.4%)

CONCLUSION. There is clearly a requirement for the continued services of our specialist transfer team. However over 50% of the interhospital transfers performed were potentially avoidable as the reason for transfer was the lack of a staffed bed at the referring hospital. The transfer of critically ill patients has been shown to be safe however it is not without risk (1). In order to reduce the number of unnecessary transfers, resources to increase the number of intensive care beds requires to be secured. With the continued pressure of inadequate resources and the increasing number of transfers performed, research into the cost effectiveness of transfer teams will be valuable in order to provide an optimal service.

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USING STATISTICAL PROCESS CONTROL TO AUDIT INSULIN ADMINISTRATION GUIDELINES

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INTRODUCTION. Changing clinical practice within intensive care units is difficult. Even where evidence exists, compliance with guidelines may be poor (1). Dissemination of guidelines alone does not lead to a change in physician behaviour (2). In 2001, Van der Berghe and colleagues published a study showing that control of blood glucose levels between 4.4 and 6.1 mmol/l in ICU patients nearly halved mortality. Despite this knowledge, a preliminary audit of blood glucose levels of our patients showed that sugar levels were outside this range. Statistical Process Control (SPC) is a method of dealing with data which is widely used in industry but not in medicine (3). We used SPC charts to assess the change in insulin prescription for our patients to test whether their use would result in better glucose control.

METHODS. Our hospital has a 13 bed intensive care unit which admits 500 - 600 patients per year, approximately 55% surgical. There are 6 consultants, 8 junior medical staff on rotation, and 90 nurses. Blood glucose levels are recorded 2-4 hourly and insulin infusions adjusted according to sliding scale. An initial audit of blood glucose levels showed that 45% of recorded levels of blood sugar lay outside the desired range. The insulin prescription was updated, and glucose levels re-audited. There was no change in the level of compliance. We then plotted glucose levels for individual patients on run charts which were shared with medical and nursing staff. We looked at blood glucose levels again.

RESULTS. Run charts showed that for most patients there was a significant improvement in the level of blood sugar control. There were fewer episodes of hyperglycaemia and less variation in blood sugar levels. Compliance with the protocol improved. Re-audit of blood glucose levels will be shown.

CONCLUSION. Statistical Process Control Charts are useful and easily constructed. They provide visual evidence that is understandable to all staff, demonstrating the beneficial effect of a change in practice. By using this simple strategy we improved the quality of care for our patients.

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2. G.D. Lundberg, JAMA 1998;280:2036.
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IMPACT OF ARTERIAL BLOOD GAS ANALYSIS GUIDELINES ON THE PRACTICE OF DIFFERENT GROUPS OF CAREGIVERS

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INTRODUCTION. Guidelines improve the quality of care by decreasing inappropriate variation to standard of the delivery of care. In a previous paper (1), we reported how an intervention based on the implementation of two generation guidelines associated with a periodic feedback in our Surgical ICU reduced the number and increased the appropriateness of arterial blood gas analysis (ABG). In this study, we explore the impact on the utilisation patterns of ABGs of different groups of ICU caregivers.

METHODS. We prospectively assessed the evolution of 3 indicators (adherence to guidelines, ABGs performed without stated reason, ABG not inducing any therapeutic adaptation) in 3 different groups of ICU professionals [physicians (Phy), trained nurses (TN) with more than 2 years of ICU experience and debutante nurses (DN)] during a baseline period of 7 consecutive days (15-21.12.97) (BP), and during a pilot period (PP) (01.01-31.10.98) and a consolidated period (CP)(01.11-31.08.99), where data were collected one day a month.

RESULTS. We analysed, 497 ABGs during BP, 821 during PP and 591 during the CP. During BP 96% ABGs were requested by TN and DN. The distribution changed ($p<0.001$) through the 3 periods with increasing participation of Phy. During BP 71%, 63% 34% of ABGs requested by Phy, TN and DN respectively, adhered to the guideline. Adherence increased over the periods for TN ($p<0.001$) and DN ($p<0.001$). The difference among the 3 groups regarding adherence disappeared in the CP (p=NS). During BP 5%, 18% and 18% of ABGs requested by Phy, TN and DN were performed without a stated indication. They decreased over the periods TN ($p<0.001$) and DN ($p<0.01$) but not in Phy. In the CP this difference among groups disappeared also. The ABGs which did not induce a therapeutic adaptation increased in Phy and TN ($p< 0.04$) and decreased in DN ($p< 0.0001$). The difference among the groups persisted over the study periods.

CONCLUSION. The 3 groups of caregivers reacted differently to the guideline. A harmonisation of practice was achieved through this intervention. The intervention permitted that the less experienced caregivers modified most their practice, joining the practice of more experienced caregivers. The analysis of practice can help identifying the group to focus on the intervention. Absence of harmonisation between groups of caregivers may indicate a difficulty in the guideline implementation.

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A SURVEY OF INTENSIVE CARE EDUCATION IN THE UK

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INTRODUCTION. The constraints of the European Working Time Directive combined with the heavy clinical workload of intensive care create challenges for the delivery of education in ICM.

METHODS. Training supervisors (one intensivist per hospital) and ICM trainees were surveyed by email and post respectively. Questions covered models of training, descriptors, adequacy of educational activities and resources, and enthusiasm for a shared, free, electronic educational resource. A 0(worst) - 5(best) scale recorded subjective opinions.

RESULTS. 52 training supervisors (33%), and 175 trainees responded. Trainee denominator is unknown. **Supervisors' responses** *Initial teaching:* 48% offered material to trainees before their ICU attachment (96% own guidelines, 39% reading lists, 13% used ICM courses) Induction teaching was offered in 71%. *Regular teaching:* Offered in 90% units (78% weekly or more frequently). Only 42% reported attendance of more than 50%. 66% obtained trainee feedback. *Teaching materials & METHODS.* 82% had an educational resource, of these 78% felt an improved educational package was necessary. Important qualities of such a package were felt to be adaptability, compliance with the syllabus and electronic access. *Participation:* 77% of supervisors would share their resource, 69% would use shared resources. 46% would contribute to a new resource. **Trainees responses** *Initial teaching:* 52% accessed educational material before starting in ICM. 46% received induction teaching (53% series of introductory tutorials, 30% single tutorial, 5% had attended a formal ICM course). *Regular teaching:* 75% had access to regular teaching sessions; in 64% these occurred at least weekly. Only 35% reported attendance of 75% or more. *Teaching materials & METHODS.* highest rated methods were bedside teaching (4.47) and small group tutorials (4.00). External meetings (2.78) and internet based resources (2.76) were rated the lowest. *Documentation:* 35% of trainees were using the national competency based training documents, 26% had completed an educational contract. 47% of supervisors, but 21% of trainees, rated their teaching programme as inadequate.

CONCLUSION. The provision and uptake of teaching in ICM in the UK is variable, and constrained by the working environment. The utility of an electronic educational resource may be enhanced if it were accessible in the workplace and supported traditional teaching methods. We thank the IBTICM for their support.

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RULES BASED ELECTRONIC PRESCRIBING REDUCES DRUGS SPEND IN CRITICAL CARE

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INTRODUCTION. We have introduced a rules based electronic prescribing and information management system (CCIPS) to 26 of the Trust's critical care beds. The system encourages compliance with guidelines; by simple prompts; password acknowledgement of some messages; enforcing consultant-only prescriptions or disqualifying certain drugs. It can also limit the duration of prescriptions. These actions can be driven by on line clinical data, all settings being user defined. Improving patient safety and quality of care has been the primary focus of CCIPS. A secondary focus has been reducing the drug spend, particularly sedative costs by encouraging the use of midazolam rather than propofol. This is supported by a system of warning messages linked to sedation administration and sedation scores encouraging nurses to reduce sedation when patients are too deeply sedated.

METHODS. Expenditure on all drugs, propofol and midazolam and bed day delivery was collected for the 12 months pre and 7 months post CCIPS.

RESULTS. All expenditure data are expressed as cost per bed day and are presented as monthly means (sem). Significantly different post CCIPS results are marked * in the table. No other sedative agents were used as alternatives pre or post CCIPS nor were there any significant changes in purchase price of the agents.

	Propofol spend	Midazolam spend	Total drug spend
Pre CCIPS	€ 0,80 (0.08)	€ 1.4 (0,2)	€ 49.6 (2.2)
Post CCIPS	€ 0.24* (0.07)	€ 0.69* (0.1)	€ 44.9 (2.6)

CONCLUSION. The management of sedation has been a high priority in our critical care units for some time. A secondary intention of CCIPS was to reduce the use of propofol but it was expected that this usage would be replaced with midazolam. It is surprising that the introduction of CCIPS is associated with a significant reduction in total sedative use; presumably related to the nurse prompts about sedation scores. There is also a non significant trend to reduction in total drug spend (p=0.09) which is not entirely explained by the reduction in sedative costs. The potential of electronic systems to constrain costs while improving safety and quality by encouraging, or enforcing, compliance with clinical guidelines is enormous and at present largely untapped.

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A PROSPECTIVE STUDY OF QUALITY OF LIFE BEFORE AND AFTER ICU CARE

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INTRODUCTION. Intensive Care is a major source of health service expenditure and is associated with a high mortality. Existing QOL literature suggests that patients may have a poor QOL before ICU admission and in the first year after ICU but the changes in QOL with time after ICU and comparisons with pre-morbid QOL have not been studied.

METHODS. 300 consecutive patients admitted to an ICU in Scotland that were expected to survive ICU care were consented. Data was collected during hospital stay regarding demographics, treatments and outcome. The assessment of quality of life was by SF-36 at ICU admission and by postal survey at 3, 6 and 12 months after ICU.

RESULTS. 300 patients were recruited to this study and data from the first 270 patients is presented. The median age of the cohort was 60 years (r18-89); APACHE II score was 18 (r4-41); the male to female ration was 60%:40% and the median ICU length of stay was 6.7 days (r1-87). Admissions were surgical (48%), medical (39%), trauma (9%) and other (4%). Trends in the mean physical component score (PCS) and mental component score (MCS) for the 139 patients completing the 12 months are presented in figure 1. All SF-36 scores except the mental health score are lower than UK normals (age 60-65 norms) at all time points. PCS is 1.5 SD below the population normal at all time points but the MCS is similar to the normal for the population after 3 months. Age does not affect these results.

Function	Physical Health	General Health	Mental	PCS	MCS
Pre-morbid	62.8 (34.9)	57.4 (27.7)	66.4 (24.1)	36.6	46.6
3 months	59.4 (29.2)	58.0 (23.7)	75.5 (20.1)	35.4	49.7
6 months	61.7 (28.7)	58.7 (25.4)	76.8 (19.7)	38.5	52.5
12 months	61.9 (31.7)	59.9 (24.9)	76.4 (20.1)	36.9	52.1
ANOVA	p<0.001	p<0.001	p<0.001		

CONCLUSION. This data suggests a poor pre-morbid quality of life in all-comers admitted to ICU with a slow rise to a level that is lower than UK normal values. Surviving for greater than 1 year after ICU is associated with a marked improvement in quality of life perhaps suggesting efficacy for ICU.

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QUALITY OF LIFE OF SEPSIS SURVIVORS - EVALUATION WITH EQ-5D QUESTIONNAIRE

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INTRODUCTION. This study aims to evaluate Health-Related Quality of Life (HR-QOL) in patients admitted with sepsis in comparison with those admitted without sepsis, in an eight bed mixed ICU.

METHODS. Six months after ICU discharge, EQ-5D was applied. Patients admitted with sepsis were compared with those admitted without sepsis concerning background variables (age, gender, previous health state i.e., healthy/non-healthy), ICU variables (reason for admission, APACHE II and ICU days)and EQ-5D variables.

RESULTS. Between March 1997 and September 2001, a total of 1320 patients were admitted from which 273 (21%) were admitted for sepsis. 274 survivors were included from which, 86 (31%) were sepsis survivors. There were no differences between both groups except for ICU stay that was significantly longer in the sepsis group. Although there were no significant differences in the five dimensions of the EQ-5D, there was a pattern whereas sepsis survivors reported less problems than other survivors; furthermore, EQ-VAS was significantly higher in the sepsis group – Table 1.

EQ-5D variables in Sepsis (n=86) and Non-Sepsis (n=188) Survivors

	Sepsis	Non-Sepsis	p
Mobility (%) - NP/P	68/32	58/42	0.100
Self Care (%) - NP/P	78/22	71/29	0.225
Usual Activities (%) - NP/P	53/47	47/53	0.368
Pain/Discomfort (%) - NP/P	66/44	58/42	0.222
Anxiety/Depression (%)-NP/P	53/47	43/57	0.115
EQ VAS (median)	75	60	0.040

NP - No Problems; P - Problems

CONCLUSION. At six months after ICU discharge, when evaluated with EQ-5D, survivors of sepsis may exhibit a similar if not a better HR-QOL when compared with other survivors of intensive care.

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AUDIT OF NEW MOBILE INTENSIVE CARE AMBULANCE SERVICE IN IRELAND

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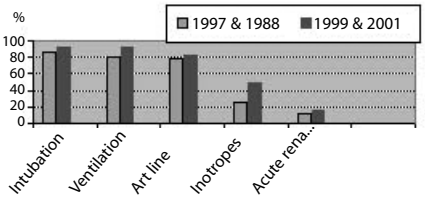
INTRODUCTION. The transfer of critically ill patients between hospitals carries significant risk as patients require continuous invasive monitoring and organ support during transfer.1 The Mobile Intensive Care Ambulance Service (MICAS) was initiated in 1996 to facilitate such transfer from local to tertiary referral hospitals. Ongoing audit allowed analysis of the effectiveness of MICAS in achieving its objectives.

METHODS. Data: Patient transfer summaries and letters to the service (Sept'96 – Dec'01) were analysed. Transfer information was entered into a computerised excel database.

RESULTS. In the 64 months of service, there were 324 patient transfers, an average of 5 per month but there were activity peaks in June-July and October- November. Over 90 % of patients were mechanically ventilated and the workload showed an increasing pattern of illness severity- Fig 1. There were no deaths during transfer.



CONCLUSION. The MICAS data confirm the demand for interhospital transport of critically ill patients and suggest that transfer using a centralised 'retrieval' system is safe despite a caseload showing a pattern of increasing illness severity.

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QUESTIONS & ANSWERS SOURCES USED FOR THE PREPARATION OF THE EDIC 2002 IN BARCELONA

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INTRODUCTION. One of the most important aims of a training program in Intensive Care Medicine is to acquire a profound general knowledge of Intensive Care Medicine. For this goal, major textbooks and journals are used by the individual fellows. The European Society of Intensive Care Medicine (ESICM) has developed the training programme Patient-centred Acute Care Training (PACT) to prepare intensivists to obtain the European Diploma in Intensive Care (EDIC). In the Netherlands, a national theoretical training program in Intensive Care Medicine is offered and the hospitals themselves have organised local courses of theoretical fellow education. In the last phase of the preparation of the EDIC, questions & answers (Q&A) sources are also used. For general use, Q&A syllabi were published by the Onze Lieve Vrouwe Gasthuis (OLVG) and the Vrije Universiteit Medisch Centrum (VUMC) in Amsterdam, a website Amsterdamse Intensive Care Fellowonderwijs Site (www.aicfos.nl) has been developed by the VUMC, and the Amsterdam Test Examination (ATE) was organised by the OLVG. We analysed the use of educational Q&A sources among the Dutch fellows during the last phase of preparation of the EDIC.

METHODS. For all fellows of the 8 Dutch training Departments of Intensive Care Medicine, we organised the ATE Barcelona 2002 on September 3, 2002. It was accompanied by questionnaire 1 to ask about the use of Q&A sources for preparation of the ATE. After the EDIC examination, we performed questionnaire 2 to ask about the Q&A sources used for preparation of the EDIC examination. In between the ATE and the EDIC examination, we released a Q&A syllabus for EDIC Barcelona 2002 which was distributed among the 8 training ICU's.

RESULTS. Sixteen fellows participated in the ATE. The response on questionnaire 1 was 100%. The 3 most used sources were Intensive Care Monitor 11 (68.8%), PACT 6 (37.5%), and AICFOS 6 (37.5%). Twenty Dutch fellows participated in the EDIC examination. The response on questionnaire 2 was 90%. The 3 most used sources were Intensive Care Monitor 13 (72.2%), OLVG Q&A Barcelona 2002 10 (55.6%), and PACT 8 (44.4%).

CONCLUSION. The Q&A sources most frequently used by Dutch fellows in the last phase of the preparation for the EDIC are Intensive Care Monitor, PACT and locally developed educational material.

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TRACHEOSTOMY PRACTICE VARIATION IN 94 ITALIAN ICUS ASSESSED BY ADMINISTRATIVE DATA

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INTRODUCTION. While a general agreement about tracheostomy (T) indications has been joined, controversies about its appropriate timing still exist (1). We conducted a retrospective observational study from 1996 trough 2000 involving 94 Regione Lombardia (RL) hospital ICUs, to assess the (T)rate, timing and practice variation, based on administrative data, obtained from (Diagnosis Related Groups)DRG system implementation.

METHODS. (RL) provided us on each patient the following: (i) demographics; (ii) whole hospital story; (iii) hospital admission diagnosis and main co-morbidities; (iv) type and date of all surgical operations and major procedures; (v) hospital outcome and final DRG. To identify tracheostomysed patient subgroup, we analysed the patient DRG schedules, looking for the ICD-9-CM code, assigned to temporary (T). SAS system was used for statistical analyses; we used non-parametric tests for continuous variables and Chi-squared test for categorical ones. To assess factors justifying a (T) early use a multiple regression model was performed.

RESULTS. 6,393 (4.3 %) patients out of 149,882 that needed one or ICU admission underwent temporary (T) with a wide variation (range 0-16.67%) in its rate among all the centres. In the tracheostomised group we found (i) higher percentage of patients admitted directly to ICU (57.9 vs. 32.6%,p<0.001); (ii)longer median (SD)ICU stay [28.9 (30.7) vs. 7.1 (16.9) days; p<0.001] and higher hospital mortality (34.2 vs. 13.6%; p<0.0001). Neuro-surgical and neurological patients and those admitted directly to ICU were more likely to be early (<5 days from ICU admission) tracheostomysed (odds ratio always > 1.4). Late (T) was found to be performed in only 2.3 % of patients, of whom, 1.64 % died and 0.63 % discharged alive from ICU. As the percentage of trachestomised patients has been steady through all the considered years, we confirmed that no clinical practice changes occurred among (RL) intensivists.

CONCLUSION. Survey results let us assert that in RL ICUs, (T) is performed according to patient clinical findings and not to secure the assigned highly refunded DRG, as no change was recorded in (T) rate, basically in the range of values reported by literature.

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EVALUATION OF A SPECIALIST TRACHEOSTOMY CARE SERVICE. FROM CRITICAL CARE TO BEYOND

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INTRODUCTION. A specialist tracheostomy service was implemented at the Leicester General Hospital to provide dedicated care to all patients with tracheostomy tubes. This included patients on the critical care unit, as well as those that had been transferred to the general wards. We assess the impact that this service has had in a teaching hospital with no on-site ENT facility.

METHODS. Two groups of patients were compared. The first comprised all patients receiving a tracheostomy in the year prior to the implementation of the service (April 1998 to March 1999), and the second comprised patients from two years after the implementation of the service (April 2001 to April 2003). For both groups, data was collected on indication for tracheostomy, type of tracheostomy, date of first tube change, date of decannulation and incidence of tracheostomy-related complications.

RESULTS. There were a total of 51 patients in the first group, and 119 patients in the second group. 88% of patients in the first group and 86.6% in the second group had a percutaneous tracheostomy. Fewer patients in the second group (17.6%, n=21) were discharged from the critical care unit to the wards with tracheostomy tubes still present, compared with the first group (39%, n=20)(P=0.006 Fisher's Exact Test). There were four tracheostomy-related complications (including two deaths) on the wards in the first group, but none in the second group (P=0.03 Fisher's Exact Test).

CONCLUSION. The specialist tracheostomy service has reduced the number of fatal and non-fatal complications on the wards to zero, and by careful patient selection has reduced the number of patients being discharged to the wards with tracheostomy tubes in-situ.

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DIFFERENCES IN EFFICACY BETWEEN HOSPITALS IN TREATING PNEUMONIA.

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INTRODUCTION. Recently the attention has been raised to differences in cost-effectiveness between hospitals in treating COPD patients [1]. In the Dutch National Intensive Care Evaluation (NICE) database, pneumonia is the second most frequent, non-surgical reason for ICU admission. The question arises if variations in efficacy can be reproduced in pneumonia patients.

METHODS. The evaluation was performed on the 3 hospitals with the highest number of pneumonia admissions in the period 1998-2002. As a proxy for efficacy we divided the total ICU-LOS of all pneumonia patients, admitted to the particular ICU, by the number of pneumonia hospital survivors. This number provides an impression of the number of ICU days needed 'to produce' 1 hospital survivor. As differences in ICU discharge policies could affect this number, a second indicator was created. For the corrected efficacy the total number of total ICU LOS (initial admission and of all re-admissions) was divided by the number of pneumonia hospital survivors.

RESULTS. The three hospitals admitted a total of 748 eligible patients.

type / n =	Hospital 1 (university / 182)	Hospital 2 (university / 296)	Hospital 3 (teaching hospital / 270)
SAPSII pred mortality	0.35	0.35	0.41*
Standardized Mortality Ratio	0.95 (0.72 to 1.22)	0.98 (0.80 to 1.19)	0.76 (0.61 to 0.94)
LOS (average/median)	12.0 / 8.0	13.5 / 8.8	7.0 / 4.0*
Efficacy (days)	17.9	20.6	10.1
Corrected efficacy (days)	18.6	20.7	10.7

** Significant differences in SAPS II (P = 0.005) and LOS (p < 0.005) were found*

CONCLUSION. Significant differences in ICU treatment duration and efficacy were found. Case mix differences (as measured by SAPS II) nor SMR were able to provide an explanation.

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INTENSIVE CARE INFORMATION SYSTEMS IMPROVES QUALITY OF PHYSICIAN DOCUMENTATION.

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INTRODUCTION. Though the impact of Intensive Care Information Systems (ICIS) on the quality of documentation has been studied before, the main attention has been on nursing notes. Intend of this study was to describe the difference in accuracy of the physicians notes between paper registration and ICIS.

METHODS. Several months after the full implementation of an ICIS (MetaVision®, iMDsoft, Tel Aviv, Israel) in our ICU we randomized all consecutive patients admitted after uncomplicated cardiothoracic surgery during 6 weeks into two groups: all documentation was done either on paper (Paper group) or by using the ICIS (ICIS group). The primary endpoint of the study was nursing time, the participating physicians were unaware that the quality of their notes was studied. Differences between the groups are given with the 95% confidence interval (CI).

RESULTS. Of 145 included patients 139 admission notes (ICIS 71, Paper 68) could be retrieved and 142 discharge notes (71 in both groups). The missing notes were all in the Paper group. Table 1 shows an excerpt of the results.

	ICIS (%)	Paper (%)	Difference (95 % CI)
A: name of patient	100	83	16.2 (7.4 to 24.9)
A: name of physician	100	83	16.2 (7.4 to 24.9)
D: past medical history	100	81	18.3 (9.3 to 27.3)
D: lowest cardiac output	98	60	38 (26.3 to 49.7)
D: drain production	97	64	32.4 (20.6 to 44.2)
D: fluid balance	100	74	25.4 (15.2 to 35.5)
D: chest X-ray description	98	64	33.8 (22.4 to 45.2)
D: medication route	98	43	54.9 (43.1 to 66.8)

A = admission note, D = discharge note

CONCLUSION. Improving the documentation of the physician is paramount to reducing errors and improving patient treatment. The use of an ICIS seems a logical step.

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ALTERATION IN SEDATION ADMINISTRATION FOLLOWING THE INTRODUCTION OF GUIDELINES IN A LIVER UNIT

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INTRODUCTION. We adapted recently published clinical practice guidelines [summarized from 1] and assessed changes in sedation administration following their introduction.

METHODS. A 14-day period was audited before and after the introduction of the guidelines. The amount of sedation received by each patient was recorded for the preceding 24 hours at 9 am daily.

RESULTS. The results were analysed using Origin 7 software. The patient characteristics are displayed in Table 1 and results displayed in Table 2.

Patient characteristics

	Pre- guidelines n=103	Post-guidelines n=114
Age (years)	50.33	41.11
Length of stay (days)	14.83	30.32
Acute presentation	46(45%)	61(54%)
Male sex	77(75%)	53(46%)
Haemofiltration	50(49%)	77(68%)
Tracheostomy	49(48%)	76(67%)

Mean sedation/patient/24hrs

	Pre-guidelines n=103	Post-guidelines n=114	p value
Propofol (ml)	17.35	30.56	0.137
Lorazepam (ml)	35.8	20.8	0.142
Fentanyl (ml)	31.75	34.86	0.727
Paracetamol (mg)	0.33	0.66	0.021*

CONCLUSION. There was a statistically significant increase in the use of paracetamol. There was a trend to a reduction in use of lorazepam and increase in propofol. The post-guideline group included a greater percentage of younger acute patients which might explain the trend away from lorazepam to propofol. Raising awareness of sedation may be another factor.

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MECHANICAL VENTILATION IS A MAJOR RISK FACTOR FOR SEPSIS IN PTS WITH CARDIOGENIC SHOCK

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INTRODUCTION. Revascularization increases long-term survival in pts with cardiogenic shock (CS) but little is known on short term complications in pts with CS, especially in those who do not undergo immediate cardiovascular surgery. We studied risk factors and the occurrence of sepsis in a previously characterized group of pts with CS (1)who did not undergo cardiovascular surgery within 1 week after shock onset.

METHODS. 35 pts with CS free of infection at time of enrolment met the inclusion criteria. Their ICU-databases were reviewed for complicating sepsis during ICU-stay. Sepsis was defined according to ACCP/SCCM consensus criteria. Microbiologic confirmation or strong clinical evidence of pneumonia was required.

RESULTS. 14 pts (40%) developed sepsis during ICU-stay, predominantly (71%) within 5 days after shock onset (median 3 (IQR 2-7)). 11 pts died within 24hrs after enrolment and 10 pts did never develop sepsis during ICU-stay. Pneumonia and catheter related infections were the main causes of sepsis (57% and 29%) and sepsis was microbiologically proven in 93% of the cases. Pts who developed sepsis during ICU-stay had a higher 28-day mortality (87.5%), were more frequently mechanically ventilated (100%) and treated by intraaortic balloon counterpulsation (IABP, 79%) than patients who did never develop sepsis during ICU stay (50%, 30% and 10%, respectively).SOFA- and APACHEII-scores, in-hospital-time before ICU-admission and the length of stay at the ICU were, however, not significantly different between these 2 groups. Accordingly,the rate of sepsis during ICU-stay was higher among 24hr-survivors who were mechanically ventilated at enrolment than among those who were not (81% vs. 0%,p<0.001,OR 65.3) and higher among those treated by IABP at enrolment than among those who were not (91% vs. 25%,p=0.003,OR 33.0 (95%CI 2.9-374)). APACHEII- and SOFA-scores were, however, not significantly different between the respective groups.

CONCLUSION. 1) Pts with CS are particularly prone for development of sepsis as the rate in our pts was 4-fold higher than that reported in an unselected patient population at a cardiovascular ICU (2). 2) Mechanical ventilation and IABP are major risk factors for development of sepsis in pts with CS and sepsis increases mortality in CS-pts from 50 to 87%.

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BASIC (BACTERAEMIA STUDY IN ICU) PHASE 2: PRELIMINARY RESULTS OF A PROSPECTIVE MULTICENTRE AUDIT

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INTRODUCTION. Appropriate antibiotic therapy (Rx) for bacteraemia (B) will influence outcome in the critically ill. However, the lack of PRCTs to determine optimal treatment has led to a wide variation in clinical practice (1).

METHODS. Between Jan 2002 - Jan 2003, prospective data were collected in each of 124 participating ICUs (97 European, 11 Australasian, 77.5% general) on a minimum of 20 microbiologically proven patients with (B), over a 4-8 month period. These data included: (i) demographics;(ii) microrganisms identification and antibiotic sensitivity patterns; (iii) (B)-related risk factors; (iv) treatment (type(s) and duration); (v) clinical response and ICU and hospital outcomes and late infectious complications occurring over a 3 month follow-up period. SAS system software was used for statistical analyses including multivariate regression to identify factors responsible for the principal outcome, that is practice variability. Only preliminary data are presented here.

RESULTS. 1574 bacteraemic patients experienced 1897 episodes of (B). Out of total number of episodes 41.4% were causing admission of the patient to ICU, while the remaining percentage occurred over the ICU stay. No substantial differences in type of microrganism isolated were found among participating ICUs. The predominant Gram-positive organisms isolated were *Staphylococcus aureus* (450, 19.1%) Coagulase-negative *Staphylococcus* (410, 17.4%), and *Enterococcus spp* (169, 7.2%). *Pseudomonas spp* (239, 10.2%), *Escherichia coli* (182, 7.8%) and *Klebsiella spp* (155, 6.6%) were the most frequently isolated Gram-negative (B). Fungi only accounted for 6.1% of all bloodstream infections, most being *Candida albicans* (67.1%).

CONCLUSION. These preliminary data from a large multi-national ICU patient cohort confirm (i) a large prevalence of Gram-positive microrganisms; (ii) and a wide variation in antibiotic prescribing policy in terms of both type and duration. Further statistical analyses are warranted to establish if any differences exist in clinical response, outcome, relapsing episodes, prevalence of (B)-related late infectious complications among different applied prescribing policies.

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EYE CARE MEASURES FOR THE CRITICALLY ILL - MORE HARM THAN GOOD?

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INTRODUCTION. Corneal exposure and microbial keratitis are potentially devastating ocular disorders. Infection may progress rapidly and result in severe impairment of visual acuity and even globe perforation within 24 hours. There have been many reports of microbial keratitis in ITU and the need for effective eye care has been recognised for some time. This prospective comparative study looks at the prevalence of corneal surface disease in ITU and the effectiveness of different eye care regimes at preventing corneal surface disease. This study also assesses factors which may identify individuals who are at high risk of corneal surface disease.

METHODS. Although eye care protocols exist, they are not strictly followed and eye care regimes for individual patients tend to be instituted at the discretion of doctors and nurses. intensive care unit patients admitted to an over a five month period were examined at fortnightly ophthalmology ward rounds for signs of ocular surface disease. An indirect ophthalmoscope and 20 Dioptre lens were used. The eye care regime was recorded as well as palpebral aperture, chemosis and anterior chamber activity. Length of stay, ventilation support, sedation score, paralysis and APACHE score were noted. All patients who spent less than three days on the unit or with primary were orbital injury were excluded.

RESULTS. 44 patients were recruited. A total of 21 were found to have exposure keratopathy (48%). Four different eye care methods were identified. (1) No Lacrilube or geliperm. – 24 patients. Exposure keratopathy was identified in 13 (54%). (2) Lacrilube only – 4 patients. None developed exposure keratopthy. (3) Geliperm dressing only – 10 patients. Exposure keratopathy was identified in 9 (90%). (4) Lacrilube and Geliperm dressing – 6 patients. Only 1 was found to have keratopathy.

CONCLUSION. Of all the combinations of eye care employed on the ITU it has been found that lacrilube alone is the most effective measure at preventing ocular surface disease. Geliperm is the most widely used eye care measure on ITU, but its efficacy has never previously been assessed. We suggest that the use of Geliperm may be of more harm than benefit. This may be due to excessive drying, misplacement of the dressing or excessive lid closure. Owing to the high prevalence of Ocular surface disease on ITU We recommend that Lacrilube alone be used as a prophylactic measure rather than Geliperm.

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TRAUMATIC AND NON-TRAUMATIC PATIENTS IN THE INTENSIVE CARE UNIT: INFECTIOUS COMPLICATIONS

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INTRODUCTION. The purpose of the study is to examine the differential characteristics of the infectious pathology in multiple trauma [MT] patients (pts) versus non-trauma (NT) ICU pts.

METHODS. We studied retrospectively 336 ICU pts (mean age 51.4±22.8 years) who developed an ICU-acquired infection; sub-divided in 2 groups: MT:186 pts (55.4%), mean age 41.2±16.3, and NT 150 pts (44.6 %), mean age 64.1±24.1. In MT pts the mean injury severity score (ISS) was 24.7±10.4 and 110 of them (59.1%) had a head injury with mean Glasgow Coma Scale of 8.6±3.0. In NT pts underlying diseases were: complicated surgery 107, vascular cerebral accident 12, haematological malignancies 4, acute necrotizing pancreatitis 4, COPD 4, other 19. The variables analyzed were : emergency surgery (ES), duration of mechanical ventilation (DMV), duration of weaning (DW), length of stay (LOS), ventilator-associated pneumonia (VAP), central venous catheter-related infection (CVC-RI), intra-abdominal infection (IAI) and mortality rates (M).

RESULTS. The results of the above 8 variables in the three groups: All pts, MT and NT, respectively, were: ES:100 (29.8%), 89 (47.8%), 11 (7.3%); DMV(days):16.0±9 .4, 19.6±8.1, 11.6±6; DW(days): 3.7±1.7, 3.9±1.5, 3.5±1.1; LOS(days): 18 .6±12.4, 23.4±10.1, 12.7±6.4; VAP: 207 (61.6%), 128 (68.8%), 79 (52.7%); CVC-RI : 67 (19.9%), 37 (19.9%), 30 (20%); IAI: 61 (18.2%), 21 (11.3%), 40 (26.7%); M: 58/336 (17.3%), 41/186 (22.0%), 17/150 (11.3%). The predominant invading microorganisms were *Ps. aeruginosa* (42.2%), *Ac. baumannii* (33.4%) and *St. aureus* (19.2%).

CONCLUSION. 1) MT pts had significantly greater need for ES ($p<0.001$), longer DMV ($P<0.01$) and LOS ($P<0.01$) than in NT pts. 2) MT pts were younger ($p<0.01$). 3) DW was longer in MT pts but not significantly ($p<0.1$). 4) VAP was diagnosed more frequently in MT pts, but not significantly ($p<0.1$). In head injured MT pts it occurred much earlier, mainly in the first 5 days - probably due to aspiration- while in NT pts occurred after the 7th day. 5) CVC-RI was similar in both groups. 6) In contrary IAI was observed more frequently in NT pts ($p<0.05$), while rupture of liver in MT pts, more than any other abdominal pathology was associated to severe sepsis, MODS and high M rates. 7) M rates were higher in MT pts ($p<0.01$).

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DOES ANTISEPTIC COATING REDUCE THE COLONIZATION AND CRBSI RATES OF CENTRAL VENOUS CATHETERS ?

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INTRODUCTION. Central venous Catheter sepsis is an important complication in ICU. Studies have suggested that antiseptic coated catheters reduce catheter-related sepsis but not the rates of catheter colonization[1,2].We evaluated Catheter colonization and catheter related blood stream infection (CRBSI) between antiseptic and plain polyurethane catheters inserted in the sub clavian vein in our ICU.

METHODS. This was a prospective study conducted in 2 phases. Phase I included all patients having plain catheters between the period April 1999 to December 2000. Phase II included all patients who had chlorhexidine and silver sulphadiazine coated catheters (ARROWGARD). All catheters were inserted as per ICU protocols. Patients on TPN, those with PA catheters, dialysis catheters and on immuno-suppression or catheters in place <48 hours were excluded from the study. The catheters were removed when no longer required or under suspicion of catheter related sepsis. The tip was sent for semi quantitative culture by Maki's roll plate technique. Statistical analysis was done with Mann Whitney U test.

RESULTS. A total of 160 patients were identified, out of which 40 patients were in Phase I and 120 patients in Phase II. There was no variation in clinical and demographical variables and APACHE II scores. There was a 25.64% incidence of CRBSI in Phase I when compared to 15.65% in Phase II. Catheter colonization occurred in 10.2% in Phase I and 9.56% in Phase II patients.(Table 1)

	Colonization	CRBSI	catheter days	APACHE II
Phase I	4/39 (10.2%)	1039 (25.64%)	4.2	15.48
Phase II	11/115 (9.56%)	18/115 (15.65%)	4.6	14.23

CONCLUSION. Antiseptic coated catheters reduce catheter related blood stream infection.

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EPIDEMIOLOGY OF SIRS/SEPSIS IN A INTENSIVE AND SEMI INTENSIVE CARE UNIT IN A BRAZILIAN TERCIARY HOSP

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INTRODUCTION. SIRS, sepsis, severe sepsis and septic shock are important causes of increasing severity and mortality risk in the intensive care setting. Studies had demonstrated that have been an increasing incidence of sepsis in the last decade, with estimated lethality of 28%, despite all the medical efforts. The prognosis may vary, mostly because the severity of illness and organ dysfunction at the time of the injury.

METHODS. Prospective cohort study in which all patients admitted to the intensive and semi intensive care units were enrolled, between april/2002 and february/2003, until discharge. A total of 570 (medical and surgical) were admitted in both units (339/ICU vs 231/SICU). Were excluded pregnant women and patients with less than 18 years old. The objective is to examine the incidence of sirs, sepsis, severe sepsis and septic shock in ICU and SICU.

RESULTS. Overall 211 infections episodes were recorded at admission (31%/ICU vs 45%/SICU) to the units. About 23% of infections were associated with sepsis, 26% severe sepsis and 33% septic shock. Over 10% of patients infected could not be classified in any of the categories. The incidence of SIRS was high, affecting one third of patients (34%/ICU vs 19%/SICU). Hospital mortality rates were similar, 18% in SICU and 22% in ICU patients.

CONCLUSION. The incidence of infection in a ICU, although varying among hospital and patients subsets, remains high, demanding hospital resources. Whether the infection is confirmed or not, the outcome is similar within each corresponding stage. Approximately 30% of admitted patients had SIRS criteria, mostly surgical. But these recognition did not help to identify those who had prove to be infected or at risk of developing severe stages.

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PHARMACOKINETICS OF SULBACTAM AND PIPERACILLIN DURING CONTINUOUS VENO-VENOUS HEMODIAFILTRATION

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INTRODUCTION. Continuous extracorporeal treatment of acute renal failure is frequently used in critically ill patients. Likewise, patients presenting with sepsis and multiple organ failure are often treated with piperacillin and beta-lactamase inhibitors. Although frequently administered, pharmacokinetic data of sulbactam during continuous veno-venous haemodiafiltration (CVVHDF) are scarce and inconclusive. We therefore investigated the pharmacokinetics of sulbactam in combination with piperacillin in critically ill patients with anuric renal failure reliant upon CVVHDF.

METHODS. Single dose pharmacokinetics was studied in 9 patients after short-time infusion of 1g sulbactam in combination with 1g, 2g or 4g of piperacillin. In addition multiple dose pharmacokinetics were investigated at steady-state in 6 patients receiving 1g sulbactam b.i.d. or t.i.d. in combination with piperacillin 2g b.i.d., 4g b.i.d. or 4g t.i.d. Pharmacokinetic parameters were determined from repeated blood and dialysate sampling up to 12 hours after sulbactam dosing.

RESULTS. Sulbactam pharmacokinetics: For the single dose, total clearance (Cl) was 84±37 mL/min; Cl by CVVHD (ClCVVHDF) was 24±10 mL/min and elimination half-life (t1/2) 5.9±1.5 hours. Multiple dose pharmacokinetics at steady state for the b.i.d. and t.i.d. sulbactam dosing schedules was: Cl 71 vs. 37 mL/min, ClCVVHDF 21 vs. 11 mL/min and t1/2 5.2 vs. 10.6 hours, respectively. Piperacillin Cl was in the order of 60 mL/min, ClCVVHDF 15 mL/min and t1/2 6 hours. There was no pharmacokinetic interaction between sulbactam and piperacillin. Sulbactam and piperacillin clearances were significantly correlated ($r=0.71$, $p<0.001$), but not t1/2. The data indicate a higher than expected sulbactam accumulation and a reduction of non-renal drug elimination during t.i.d. treatment.

CONCLUSION. Differing from previous recommendations the optimal dosage of sulbactam is proposed to be 1g b.i.d. in anuric patients reliant upon CVVHDF

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VALUE OF C-REACTIVE PROTEIN, TEMPERATURE AND WHITE BLOOD CELLS IN THE DIAGNOSIS OF INFECTION

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INTRODUCTION. The critical care patient has frequently clinical manifestations of sepsis (fever, tachycardia and leukocytosis) even without infection, so it becomes important to find markers that help its diagnosis. The aim of this study was to determine the value of C-reactive protein (CRP) as a marker of infection in comparison with temperature and white blood cells (WBC).

METHODS. The study included 76 infected and 36 non-infected patients consecutively admitted to a medical-surgical intensive care unit (ICU). CRP, temperature and WBC were monitored daily. The day of comparison was defined as the day of positive cultures (blood cultures or broncho-alveolar lavage) in infected patients. Non-infected patients had no bacteriological or clinical signs of infection and did not received antibiotic therapy during ICU stay; for comparison purpose it was considered the worst CRP (at least two determinations), temperature and WBC of the first 24 hours.

RESULTS. Multiple receiver-operating characteristic (ROC) curves were used to compare each parameter for infection diagnosis. The area under the curves of CRP and temperature were 0.932 and 0.751, respectively ($p<0.001$). A CRP concentration > 87 mg/L and a temperature > 38.2ºC were associated with infection with a sensitivity of 93.4% and 54.8%, respectively, and a specificity of 86.1% and 88.9%, respectively. ROC curve of WBC demonstrated poor diagnostic value. The combination of CRP and temperature increased the specificity for infection diagnosis to 100%. Median CRP levels in infected patients with sepsis, severe sepsis and septic shock were 145 mg/L, 172 mg/L and 233 mg/L, respectively ($p=0.024$). CRP levels in infected patients with and without bacteraemia were similar ($p=0.59$).

CONCLUSION. CRP is a good marker of infection and performs better than temperature.

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CHARACTERISATION OF PATIENTS WITH NECROTIZING FASCIITIS REQUIRING INTENSIVE CARE.

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INTRODUCTION. Necrotizing soft tissue infections (NSTIs) can have an unpredictable clinical course. Risk factors have been suggested (1) but outcome in the intensive care population is unknown. We reviewed patients admitted to the ICU of a tertiary plastic surgery centre over a five year period.

METHODS. Data were collected prospectively for all ICU admissions with cellulites using Ward Watcher software (Critical Care Audit Ltd., Yorkshire). Medical records, bacteriological and pathological reports were reviewed for those meeting clinical and/or pathological criteria for NSTIs.

RESULTS. 23 patients were identified. ICU and hospital mortality were 35% (n=8). Survivors were younger, had lower APACHEII and SAPSII scores and a longer ICU stay (Table 1). Predisposing factors were intra-venous drug abuse (IVDA)(10), diabetes mellitus (3), immunocompromise (1), alcoholism (3). A possible aetiology was identified in 19; subcutaneous injection (10), trauma (3), perineal abscess (4) and intra-abdominal sepsis (2). Pathological confirmation was obtained in 10 cases. Delay in diagnosis of >48hrs did not impact on survival (7/10 survived). Streptococcus pyogenes was the commonest organism isolated 34.8%(n=8) but was associated with only 1 death.

Outcome Parameters

ICU and Hospital Outcome	Age (years) Mean (Range)	APACHE II Mean (Range)	SAPS II Mean (Range)	ICU Stay (days)
Survivors n=15	36.3 (13 - 70)	17.6 (2 - 30)	30.6 (6 - 59)	10.4 (0.5 - 53)
Non-Survivors n=8	48.0 (27 -69)	23.0 (14 - 31)	47.4 (29 - 74)	5.1 (0.3 - 20)

CONCLUSION. Despite a mortality rate similar to other studies (1) a delay in diagnosis did not affect survival, reflecting the diverse virulence of this disease. Our patient cohort incorporated many IVDAs. Deaths in this group occurred only with Clostridial infection.

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CYTOMEGALOVIRUS REACTIVATION IN „IMMUNOCOMPETENT“ CRITICALLY ILL PATIENTS

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INTRODUCTION. Primary cytomegalovirus (CMV) infection is usually asymptomatic, and CMV antibodies are found in a large percentage of the adult population. Symptomatic reactivation is known to occur in immunosuppressed patients and carries a considerable morbidity and mortality. The immune status of critically ill patients is generally still a matter of debate, and the role of opportunistic infections like CMV for this patient group is unclear [1]. We monitored the patients of a medical ICU for CMV reactivation to determine its frequency and its impact on outcome.

METHODS. All patients admitted to the medical ICU of the university hospital of the Free University of Berlin were monitored for CMV reactivation from October 2002 until February 2003. CMV antibody status was determined on admission, and weekly pp65 antigenemia tests were carried out for the early detection of CMV viremia.

RESULTS. Out of 33 patients monitored, we detected 3 CMV reactivations in patients without a known immunodeficient state within 5 months. All 3 patients were septic and died in the ICU. Of the patients who remained CMV negative, 18 were treated for sepsis, the mortality in this group was 33%. No definitive CMV end organ manifestations were observed in the patients with CMV viremia.

CONCLUSION. CMV reactivation does occur in critically ill patients without a known immunodeficient state. In this study, CMV reactivation was only observed in patients with sepsis. The reasons for CMV reactivation in these patients are unclear. On the one hand, septic patients may be regarded as immunosuppressed to some extent [2], on the other hand, CMV reactivation could also be due to either the release CMV-inducing inflammatory mediators during sepsis (e.g. TNF-alpha) or to direct catecholamine-related alphaadrenergic stimulation of the CMV-promoter [3].

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MEDIASTINITIS :RISK FACTORS, MANAGEMENT AND OUTCOME

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INTRODUCTION. Primary infection of the mediastinum is a rare event,but potentially devastating infection.The most frequent cause of mediastinitis (M) is cardiac surgery. OBJECTIVE: To determine the incidence and aetiology of M, excluding poststernotomy cases, in a medical-surgery ICU of a reference hospital. To describe the risk factors(RF), treatment(T) and outcome of these patients(pt).

METHODS. Descriptive-retrospective study (from January/95 through June/02).Pt’s characteristics, RF, interval between the beginning of the symptoms and the surgical T,ICU length of stay(LOS),T and mortality. Statistical analysis: t Student, Chi square.

RESULTS. Of 7173 pt admitted at ICU (mortality 25 %, LOS 11,27 days), 40 (0.56%) corresponded to M. Male pt 52,5%, mean age (years) 52,95±16.6, APACHE II 17.6±9.9. Etiology: Cervical necrotizing fascitis (CNF) 50%, oesophageal perforation 35% (endoscopy 6/40, Sd Boerhave 3/40), previous oesophageal/pulmonary surgery(surg) 15%. The most frequent RF were previous surg 11.25%,tobacco habit 10%,broncho-pulmonary pathology 8.75% and endoscopy 7.5%; no RF in 39.15%. Antibiotic T of wide spectrum in all the cases; the most frequently used were(%): Carbap 19.66, Piper-Tz 14.53, Amoxi-Clav 10.26, Cefota 10.26, Clinda 8.55. Surgical intervention in 85% (not surg in 6/40 pt). The T interval was of 7.37±4.81 days, lower in those due to CNF ($p<0.05$). Pleural/mediastinal drainage in all surgical cases. Reintervention 36.19%. Mechanical ventilation (MV): 11±11.8 days, longer in those due to CNF ($p<0.05$). ICU LOS(days): 17.9±15.6, longer in those due to CNF ($p<0.05$). Mortality 35%.

	CNF	OTHER ETIOLOGIES	P
AGE	45.1 ± 17.37	60.8 ± 12.31	<0.05
APACHE II	19.55 ± 11.12	15.65 ± 8.37	NS
ICU LOS	23.05 ± 16.35	12.75 ± 13.41	<0.05
M. V. DAYS	16 ± 13.75	7 ± 7.42	<0.05
TREATMENT INTERVAL	7.5 ± 4.6	9.86 ± 3.06	<0.05
MORTALITY	25%	45%	NS

CONCLUSION. The most frequent cause of M in our experience was the CNF. Pt with M due to CNF were younger, with shorter t interval. Length of MV and ICU stay were longer in CNF M, probably due to the lower mortality rate.

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INFECTIOUS COMPLICATONS IN ADULT LIVING RELATED LIVER TRANSPLANTATION RECIPIENTS

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INTRODUCTION. Recipient morbidity after adult living related liver transplantation (LRLT) has been attributed mainly to biliary and vascular complications.1 However infection is one of the leading cause of recipient death(1). Furthermore, an in-deep evaluation of medical complications of LRLT recipients is still incomplete (2). We reviewed the infectious complications in the first ten patient (pt) series of LRLT performed at the Liver Transplant Centre of Turin (2001-2002).

METHODS. Ten pts receiving a right lobe LRLT (Group A) were matched with 20 pts (Group B) receiving a whole graft liver transplantation (LT) chosen with regard for transplant year, donor and recipient age, cause of cirrhosis, Child and UNOS status, blood requirement, ischaemia times and immunosuppressive treatment. All pts received a prophylaxis with ceftizoxime and amphotericine B. Diagnosis of infection was made if clinical and radiological signs were present together with a positive colture. Rejection was biopsy proven. Infectious complications, rejections and reinterventions occurring within the first hospital stay were recorded. Comparison between groups with a Chi-Square test.

RESULTS. We recorded 13 infectious episodes (4 cholangitis, 3 peritonitis, 2 pneumonia, 2 wound infections, 2 bacteremia) in 8 group A pts and 4 episodes in 4 group B pts (3 cholangitis, 1 pneumonia) ($P<0,05$). The most frequently isolated pathogens were Gram positive bacteria: Staphylococci (Epidermidis-Aureus) and Enterococci (faecalis-faecium). Fungi were isolated in two cases of pneumonia. In two group A pts, pathogens responsible for peritonitis and cholangitis were retrieved also in blood coltures. In group A one pt died due to sepsis. There were 3 pts with rejection in group A (30%) and 4 in group B (20%). Surgical reintervention were necessary in 5 group A pts (50%) and in 1 group B pt (5%)($P<0,05$). Two group A pts were retransplanted.

CONCLUSION. LRLT recipients have a high incidence of infections mainly of abdominal origin and involving Gram positive bacteria. Technical improvement and a more adequate antibiotic prophylaxis may decrease infection risk in LRLT recipients.

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EFFICACY OF HIGH DOSE LIPOSOMAL AMPHOTERICIN (AMBISOME®) IN SUSPECTED FUNGAEMIA IN INTENSIVE CARE.

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INTRODUCTION. Amphotericin B is considered the optimal treatment for systemic fungal infections, but has significant effects on renal function. Liposomal Amphotericin B (Ambisome®) is formulated to decrease these adverse effects at a dose of 1-3 mg kg^{-1} day^{-1}. Higher doses provide higher concentrations earlier, but there is little information available regarding use in critically ill patients. We aimed to determine whether the safety profile, in particular renal function, is altered by higher doses in critically ill patients.

METHODS. We retrospectively reviewed 31 patients treated with Ambisome® in a two year period. Ambisome® 5 mg kg^{-1} day^{-1} was given for 3 days and continued for up to 7 days if fungaemia was identified or there were signs of clinical improvement. The outcome measures were renal function measured 3 days after completion of treatment and survival to discharge from Intensive Care and hospital.

RESULTS. Mean age was 55 (SD 17) years; with median APACHE score of 19 (range 5-32). Twenty-three patients had yeast identified in blood culture or sterile sites. Eight were commenced on Ambisome® as they were deemed high risk[1]. Cultures demonstrated eradication in all patients. Fifteen of 31 patients survived. Thirteen died in Intensive Care and 3 died prior to hospital discharge. There was no statistically significant change in renal function (paired t-test).

	Pre Ambisome Urea	Pre Ambisome Creatinine	Post Ambisome Urea	Post Ambisome Creatinine
All Patients	13.2 (11.7)	145 (108)	16.4 (9.6)	138 (108)
Existing acute renal failure (n=13)	20.9 (23.4)	235 (237)	22.9 (23.6)	208 (204)
No pre-existing acute renal failure (n=18)	9.0 (7.5)	89.9 (83)	12.7 (11.6)	96.1 (93)

Mean (SD) values for renal function

CONCLUSION. Ambisome®, in higher doses, appears effective. We demonstrated no adverse effects on renal function.

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THE EFFECT OF SEPSIS ON LONG TERM SURVIVAL

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INTRODUCTION. A retrospective cohort study was undertaken to evaluate the factors predictive of post-hospital survival of patients admitted to an adult ICU with sepsis.

METHODS. Patients who (i) survived ICU and (ii) demonstrated clinical evidence of sepsis syndrome and/or positive cultures were identified from a computerised ICU information system and hand search of discharge summaries, over the period November 1, 1993 till July 31, 1999. Charlson Comorbidity Score (CCS) was calculated from ICD-9 codes using computerized hospital listings. Survival time, obtained from births & deaths registry and hospital follow-up, and predictor covariates for post-hospital survivors (PHS) were characterised using Kaplan-Meier and Cox model estimates.

RESULTS. The cohort comprised 229 patients, of mean(SD) age 64 (15.7) years and APACHE II score 23(8). Thirty-five patient(15.3%) died in hospital following ICU discharge. PHS patients(n=194) were followed up for minimum of 3.2 years, or until death, and a maximum of 8.9 years. The PHS were 41% female, aged 62.5 (16) years and 35% were post-operative. APACHE II score was 22(8) and 64% were ventilated. Median(range) ICU, hospital length of stay and mechanical ventilation time were 5 (1-54), 19 (1-151) and 5.2(0.05-39) days respectively. The CCS was 1(0-7). Body fluid and blood cultures were positive in 68% and 30% respectively. Kaplan-Meier survival probability estimates (95% CI) for PHS were: 0.90 (0.85-0.94) at 12 months, 0.86 (0.71-0.90) at 24 months and 0.79 (0.68-0.84) at 72 months. For PHS at 6 years, relative survival (Esteve et al 1990) compared with the Australian population was 88.6% (95% CI: 78.2%-94.3%) for males and 92.6% (79.4%-97.5%) for females. Cox model PHS predictor covariates (hazard ratio(SE)) were: age 1.02 (0.01); CCS 1.23(0.11); positive versus non-positive blood culture 1.8 (0.59); and post-operative versus non-post operative 0.52 (0.18).

CONCLUSION. Compared with the Australian population, sepsis patients show decreased survival over 6 years. Age, chronic comorbid conditions and positive blood culture reduced long term survival.

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PROGNOSTIC VALUE OF PROCALCITONIN AS A MARKER OF VAP TREATMENT FAILURE

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INTRODUCTION. The aim of this trial was to study the kinetic of procalcitonin(PCT)during VAP and its usefulness as a prognostic marker of treatment failure.

METHODS. For each patient, we measured serum PCT level at day 1, 3, 7 and 14. VAP was defined as a clinical suspicion confirmed by a positive culture of bronchoalveolar lavage (BAL) fluid (>104 CFU/ml). Treatment failure was defined as at least one of the following criteria occurring before day 28:death, superinfection or microbiological relapse confirmed by a positive culture of BAL fluid. Patients with treatment failure were compared with others.

RESULTS. Treatment failed after 16±6 days of mechanical ventilation in 31/52 patients included in the study (16 relapses and 15 deaths). There were no significant differences between the 2 groups except that patients with treatment failure were more severely ill at inclusion. Serum levels of PCT decreased from day 1 to day 14 in patients without treatment failure. At day 1, 3, 7 and 14,serum levels of PCT were significantly higher in patients with treatment failure than in others(6±11 vs. 2±6 at day 1 and 4±8 vs.0.3±0.5 at day 7,p<0.01 for both). Positive and negative predictive values of serum PCT>0.35 ng/mL at day 7 for predicting treatment failure were respectively 94%(CI 95% 72-98%)and 90%(CI 95% 60-97%.

CONCLUSION. Serum levels of PCT decreased in patients with successful VAP treatment, whereas PCT serum levels >0.35 ng/mL after 7 days of antibiotic treatment were associated with treatment failure.

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NON BRONCHOSCOPIC PROTECTED DISTAL SPECIMEN AND DEESCALATION STRATEGY (DES) IN THE APPROACH OF VAP:

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INTRODUCTION. Effective empirical antibiotic regimen remains the gold standard of successefull treatment of VAP. This approach, however, has largely promoted the prescription of large spectrum antibiotics, like VAN and IMI. Invasive (bronchoscopic) diagnostic procedures have proven their efficacy on appropriate deescalation therapy-DES (=spectrum narrowing according to the microbiological results). In our hospital, bronchoscopists are not available for the ICU pulmonary samplings. A blind protected distal catheter (Compicath) is used, whenever possible, for the documentation of a VAP .

METHODS. We retrospectively evaluated 117 patients with registered diagnosis of VAP (2,5 years period). VAP was documented by a Compicath in 37 patients (superior or equal to 10_cfu/ml)-(Compicath group-CG). In the remaining 80 patients (Non Compicath group-NCG) VAP diagnosis was based on clinical criteria (new pulmonary infiltrate, purulent tracheal aspirates, PaO2/FiO2<200, fever, leukocytosis). Empirical and final anti-biotic treatments were reviewed according to DES (DES-patients) or not (non DES-patients).

RESULTS. Multidrug bacteria (=resistance in at least two classes of the followings: b-lactams, aminoglycosides, quinolones, carbapenems, glycopeptides) were almost equally discovered in the two groups (resp. 52% and 59%, p=0,54). Mostly discovered pathogens were *A. baumanni* (45%), *P. aeruginosa* (28%) and MRSA (15%). Mean duration of antibiotic therapy before VAP was similar in the two groups (resp. 6,9+/-4 and 7,1+/-3, p=0,3). Empirical prescription of VAN and IMI was not different between groups (resp. 48% and 50,3%, p=0,9). The overall mortality of the CG and NCG patients was also not statistically different (21,5 vs 22,6%, p=0,9). With a mean delay of 3,3 days, DES was performed in 27 of the 37 CG patients (64%) according to the results of the Combicath culture (DES-patients). IMI was replaced by Pip/Tazo in 15 patients (15/27, 56%) and VAN was discontinued in 10 patients (10/27, 37%). In the above 25 DES-patients as well as in the 83 non-DES patients (=10 CG+73 NCG) VAP was successfully treated. No DES was found in the NCG patients. Consequently, in 73% (25/37) of the CG patients, IMI and VAN were safely discontinued.

CONCLUSION. Compicath in association with a de-escalation strategy can reduce considerably the use of VAN and IMI in ICUs where bronchoscopy is not available in a 24-hour basis.

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EFFECTIVENESS OF LINEZOLID IN EUROPEAN PATIENTS WITH NOSOCOMIAL PNEUMONIA

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INTRODUCTION. Linezolid is an oxazolidinone antibacterial with excellent activity against gram positive pathogens, including those resistant to penicillin, methicillin, and vancomycin. We report European results from 2 international trials that evaluated linezolid (LZD) vs vancomycin (vanco), each in combination with aztreonam, for the treatment of nosocomial pneumonia (NP).

METHODS. In both double blind studies, NP patients were randomized to LZD 600mg IV q12h or vanco 1gm IV q12h. All patients also received 1-2gm aztreonam IV q8h for gram-negative coverage. Therapy was given for 7-21 days. Test of cure was measured at follow-up, 12-28 days after end of therapy.

RESULTS. Of 1019 treated patients, 273 clinically evaluable (CE) patients were from Europe. Clinical cure in these European patients was 74.8% (98/131) with LZD vs 68.1% (94/138) with vanco (p=.22; excluding patients with missing or indeterminate outcomes), which was comparable to results seen in the global population. For CE patients with a baseline pathogen isolated, microbiologic success with LZD was 76.5% (39/51) vs 57.6% (38/66) with vanco (p=.03; excluding patients with missing or indeterminate outcomes). Adverse events were generally mild to moderate in nature, with diarrhoea being the most common drug-related event.

CONCLUSION. Linezolid with concomitant gram-negative coverage is an effective, well-tolerated agent in treatment of NP.
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INFLUENZE OF VENTILATOR ASSOCIATED PNEUMONIA(VAP) ON ICU OUTCOME IN PATIENTS WITH COPD

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INTRODUCTION. The aim of this study is to assess impact of VAP on ICU outcome in patients with COPD

METHODS. We conducted a retrospective study of 64 patients using prospectively gathered data in patients with COPD who required mechanical ventilation for acute respiratory failure. Data were obtained concerning demographics, APACHE II score, sepsis, duration of mechanical ventilation, length of ICU and hospital stay, infection development rate, causative agents and hospital mortality.

RESULTS. 42(66%) patients were developed VAP and 67% of them were septic. In hospital mortality was 31% (n:20). 41% (n:26) of patients had *Pseudomonas*, 27% (n:17) *Acinetobacter*, 22% (n:14) *S aureus* (MRSA), and 13%(n:8) had *Klebsiella*. Sepsis rates were significantly higher in patients with MRSA pneumonia but there were no significant difference in mortality between the pathogens. Mean VAP development day was 7.25±7.63. Differences between the groups are given in table. Patients with VAP had significantly longer stay in ICU and hospital and longer mechanical ventilation than patients without VAP (p<0.001). Mortality was significantly higher in patients with VAP. When we compare septic and non-septic patients, mortality were significantly higher and LOS in hospital were significantly longer in septic patients (p<0.05). LOS: Length of stay

Differences between ICU characteristics in COPD patients with and without VAP

	With VAP	Without VAP	p
APACHE II	19.86±6	15.14±4.36	<0.008
Albumin level	2.96±0.6	3.38±0.62	<0.01
Duration of MV, day	25.44±31.83	6.57±4.02	<0.009
LOS in ICU, day	26.93±29.53	8.05±5.31	<0.005
LOS in hospital, day	45.94±38.32	16.13±11.51	<0.005
Mortality, %	43%	9%	<0.006

CONCLUSION. In this study patients with VAP had significantly higher admission APACHE II scores and lower albumin levels than patients without VAP. VAP associated with higher mortality rate, longer mechanical ventilation, ICU and hospital stay. Pseudomonas was the most frequent pathogen and MRSA caused sepsis more frequently than the other pathogens.

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DIAGNOSTIC METHODS IN MECHANICAL VENTILATION-RELATED PNEUMONIA

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INTRODUCTION. To describe clinical criteria for assessing the suspicion of mechanical ventilation-associated pneumonia and to describe the techniques used for obtaining pulmonary samples for the etiological diagnosis.

METHODS. All cases of mechanical ventilation-related pneumonia diagnosed in patients included in the ENVIN-ICU surveillance study between 1998 and 2002 were evaluated. Clinical criteria for the suspicion of pneumonia were classified into compatible clinical features plus a new and persistent radiological infiltrate; spread of a previous infiltrate and clinical worsening (second pneumonia); cavitation of an infiltrate; and other. Techniques for obtaining respiration samples included simple bronchial aspirate, bronchial brushing, bronchoalveolar lavage, pleural fluid, and blood culture plus BAS. Results are expressed in percentages in respect to the total number of mechanical ventilation-related pneumonias.

RESULTS. In the 25,060 patients included in the ENVIN-UCI study, mechanical ventilation-related pneumonia was diagnosed in 1,597 (6.4 episodes per 100 ICU patients). The percentage of patients fulfilling the clinical criterion of compatible signs plus a new infiltrate increased from 74.3% to 84.6%, 2nd pneumonia decreased from 19.4% to 12.4%, and cavitation of an infiltrate was lower than 1%. Changes in techniques for pulmonary sampling varied between 70.6% and 79.4% for simple bronchial aspiration, 5% and 12.4% for bronchial brushing, 6.9% and 10.6% for bronchoalveolar lavage, and 0.6% and 1.2% for hemoculture plus bronchial aspiration.

CONCLUSION. It was observed a progressive decrease of second episodes of mechanical ventilation-associated pneumonia and a limited use of invasive techniques for the diagnosis of this condition.

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CLINICAL IMPACT OF PNEUMONIA CAUSED BY ACINETOBACTER BAUMANNII IN INTUBATED PATIENTS.

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INTRODUCTION. Ventilator-associated pneumonia caused by certain etiologies has been associated to an increase in mortality. The objective of our study was to determine whether ventilator-associated pneumonia caused by Acinetobacter baumannii (VAPAB) is associated with increased mortality.

METHODS. Design: A retrospective matched case-control study in which all ICU adult patients with microbiologically documented VAPAB were defined as cases.

METHODS. Controls were matched based on 1) length of stay before pneumonia onset, 2) disease severity (APACHE II) at admission and 3) diagnostic category.
Setting: Four ICUs from teaching hospitals.
Measurements: Population characteristics and ICU mortality rates of patients with VAPAB and their controls were compared. Attributable mortality was determined by subtracting the crude mortality rate of the controls from the crude mortality rate of the cases. Patients: Sixty patients were matched to sixty controls.

RESULTS. 24 of the 60 cases died, representing a crude mortality of 40%, whereas 17 of the 60 controls died, a crude mortality of 28.3% (p= 0.17). Crude ICU mortality was the same (12/35, 34.2%) in patients with VAPAB caused by strains sensitive to imipenem and in their matched controls. It was 44% for the 25 patients with imipenem-resistant strains with an estimated attributable mortality of 20.0% (95% confidence interval, -5.6% to 45.7%). Mean ICU stay of cases and controls was 35.3 and 36.6 days respectively (P= NS).

CONCLUSION. In intubated patients, pneumonia by A. baumannii is not significantly associated with attributable mortality rate or an increase length of ICU stay.
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SURVEILLANCE OF TRACHEOBRONHIAL SECRETIONS IN MECHANICALLY VENTILATED PATIENTS: IS THERE A ROLE?

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INTRODUCTION. The aim of this prospective observational study is to determine whether sequential quantitative cultures of tracheobronchial secretions (TRBS) in mechanically ventilated (MV) MICU patients pts correlate with clinical parameters of lower respiratory infection and influence patient outcome.

METHODS. The study was conducted in a 7-bed MICU for a one year period and included all MV pts for >48 hrs. Surgical and trauma pts and pts presenting with or subsequently developing pneumonia were excluded, as well as pts with non pulmonary causes of infection. Samples of TRBS were obtained during the first 24 hours of intubation (S1) and weekly thereafter for a maximum of 2 weeks (S2, S3) using a simple aspiration catheter, and were cultured quantitatively. All pts had purulent secretions and received empirical antibiotics that were modified according to the culture results.

RESULTS. 20 pts, 17M and 3F, mean age 71.95±8.44, mean Apache score at presentation 13.1±6.47 (12 COPD exacerbations) were studied. While 4/20 positive samples were retrieved from S1, positives rose subsequently to 16/20 for S2 to 10/12 for S3. Resistant pseudomonas aeruginosa and acinetobacter species accounted for 4/16 and 8/16 for S2 and 5/10 and 5/10 for S3, respectively. In 13 pts antibiotics were changed according to sensitivities. Mortality was high (15/20), especially in non-COPD pts (8/8), despite the use of appropriate antibiotics and it was not influenced by the type of bacteria cultured. Comparing concentrations $>10^5$ cfu to those with $<10^5$ cfu there was no positive correlation with fever (>38 C) or leucocytocis (WBC >10500) for the group as a whole, as well as for the subgroups of 12 COPD and 8 non-COPD pts.

CONCLUSION. Positive cultures of TRBS was a common finding after the first few days in MV MICU pts, with no correlation with fever or leucocytocis. The value of following and treating tracheobronchitis cannot be easily appreciated, since high mortality and persistence of resistant pathogens beyond the first week despite treatment probably reflect the poor health status of these pts. Large scale studies are needed.

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DOES NON-INVASIVE VENTILATION DECREASE THE INCIDENCE OF VENTILATOR-ASSOCIATED PNEUMONIA ?

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INTRODUCTION. Ventilator-associated pneumonia (VAP) is a serious complication in intensive care units with a reported incidence of 8-28%.[1] Non invasive ventilation (NIV) is one of the options used to minimise VAP[2]. NIV has been used extensively in our ICU since January 2002. We studied the incidence of VAP in our ICU before and after the use of NIV.

METHODS. 368 patients who were mechanically ventilated for >48 hours in the period August2001 to July2002 were prospectively studied. Endotracheal aspirates were taken on all intubated(ET) patients on days 1,3 and alternate days until extubation. If VAP was suspected on clinical, radiological or bacteriological evidence, bronchoalveolar lavage(BAL)was performed. Patients on NIV had serial sputum cultures. VAP was diagnosed by a 6point score[3],including the temperature, white cell count, tracheal secretions, PaO_2/FiO_2 ratio,radiological infiltrates and microbiological evidence of infection (colony count of 10^6 for endotracheal aspirates and 10^4 for BAL). The patients were divided into 2 groups:GpI(n=134) from August 2001 to December 2001 (NIV=1, ET=133)and GpII(n=234)from January to July 2002 (NIV=29, ET=205)

RESULTS. The mean age, sex and APACHE II scores between GpsI and II were comparable. The mean number of ventilator-days was 5.29 in GpI, 5.48 in GpII ET and 3.93 in GpII NIV. The incidence of VAP in GpI was 47/134 (35.07%), and 76/234 (32.48%) in GpII (p>0.05). In GpII NIV the VAP incidence 2/29 (6.89%) against 76/205(37.07%)in GpII ET (p<0.05). In a subset of patients with COPD (n=30),VAP incidence was 12/19(63.16%)in ET GpsI and II, and 1/11 (9.09%) in GpII NIV (p<0.01)

CONCLUSION. NIV decreases the incidence of VAP especially in COPD patients thus reducing morbidity of critically ill patients.

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IMPACT ON THE OUTCOME OF VENTILATOR-ASSOCIATED PNEUMONIA CAUSED BY ACINETOBACTER BAUMANNII .

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INTRODUCTION. To determine whether ventilator-associated pneumonia caused by Acinetobacter baumannii (VAPAB) is associated with increased mortality and excess in the length of stay.

METHODS. A retrospective matched case-control study was carried out in four Spanish ICUs in which all adult patients with microbiologically documented VAPAB were defined as cases. The study period was from January 1996 to June 2001. Controls were matched based on 1) length of stay before pneumonia onset, 2) disease severity (APACHE II) at admission and 3) diagnostic category. Population characteristics and ICU mortality rates of patients with VAPAB and their controls were compared. Attributable mortality was determined by subtracting the crude mortality rate of the controls from the crude mortality rate of the cases.

RESULTS. During the study period 15,679 patients were admitted to the participating units, and 83 episodes of VAP caused by Acinetobacter baumannii alone were identified. Sixty cases were successfully matched and enrolled in the study. Twenty-four of the 60 cases died, representing a crude mortality of 40%, whereas 17 of the 60 controls died, a crude mortality of 28.3% (p= 0.17). Crude ICU mortality was the same (12/35, 34.2%) in patients with VAPAB caused by strains sensitive to imipenem and in their matched controls. It was 44% for the 25 patients with imipenem-resistant strains with an estimated attributable mortality of 20.0% (95% confidence interval, -5.6% to 45.7%). Mean ICU stay of cases and controls was 35.3 and 36.6 days respectively (P= NS).

CONCLUSION. In intubated patients, pneumonia by A. baumannii is not significantly associated with attributable mortality rate or an increase in the length of ICU stay.

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SELECTIVE DIGESTIVE DECONTAMINATION IN SEVERE HEAD TRAUMA: INFLUENCE ON NOSOCOMIAL INFECTIONS

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INTRODUCTION. Ventilator-associated pneumonia (VAP) is a common complication in mechanically ventilated patients with severe head trauma (SHT). Selective digestive decontamination (SDD) is a strategy designed to prevent infection in the intensive care unit. The objective of this study was to evaluate SDD in the prevention of nosocomial infection (NI) in severe head trauma patients.

METHODS. Prospective, non-randomised study comparing two consecutive groups of SHT requiring mechanical ventilation for >48hrs. In the first 25 patients, the SDD was not used (G0). In the next 25 SHT (G1) the SDD regimen was: polimixin E, gentamicin and anphotericin B. Systemic ceftriaxona (1gr a day) was given for the first 3 days. We observed evolution and repercussion on NI: VAP, urinary tract infection (UTI), central venous catheter related bloodstream infections (CVCRB). We compared mean and 95% confidence interval (CI) and calculated the relative risk (RR) of NI.

RESULTS. There were not differences between G1 vs G0: male 68 vs 80%; Age 41 years (R 84-14) vs 41 (R 85-18); APACHEII 23.8 (IC 21.1-26.5) vs 20.4 (IC 18- 22.8) p 0.69; ISS 29.2 (IC 26.3-32.1) vs 31 (IC 28.1- 33.9) p 0.55; days of mechanical ventilation, the stay in ICU and CVCRB were reduced but no significantly. The influence of DDS on NI was: VAP RR 0,22 (IC 0,1-0,56) NNT 2 (IC 1-3); ITU RR 0,20 (IC 0,05-0,82) NNT 3(IC 2-10). In G1 mortality was 16% vs 32% in G2 (RR 0,5; IC 0,17-1,45). There was no emergence of resistant micro-organism when SDD was used.

CONCLUSION. In our group of patients, SDD reduces VAP and UTI, without significative repercussion on others variables.

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INCIDENCE OF VENTILATOR ASSOCIATED PNEUMONIA AND PATHOGENS ISOLATED IN MECHANICALLY VENTILATED PATIE

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INTRODUCTION. NIV reduces the incidence of Nosocomial Pneumonia(NP)(1).Aim of the study was to investigate bacterial patterns of NP developed in COPD pts with acute exacerbation treated with NIV or conventional ventilation(CV)with endotracheal intubation(ETI).

METHODS. We conducted retrospective study in cohort of 50 COPD patients requiring MV for ARF.All patients were checked for onset of NP during ICU stay.NP was diagnosed according to clinical and microbiologic criteria based upon quantitative BAL(2).

RESULTS. 18 had CV,19 succeded with NIV,13 failed NIV and underwent CV after ETI(NIV + CV). Standard statistics was performed.Overall NP incidence was 52%(26NP in 50 pts).1 pts in NIV had NP 24h after admission.S.Aureus NP were more frequent in NIV+CV,than CV group.6(54%)out of 11 NP were sustained by S.Aureus species in NIV+CV groups vs 0 in CV group(p=0,003); higher the number of episodes of Pseudomonas A. NP in CV group(71%vs36%,p=0.09). VP Onset time was no different.Number of multiresistant bacteria was similar(7vs8,p=0.5)

	CV	NIV	NIV + CV
N	18	19	13
Age	71 +/- 9	71 +/- 14	74 +/- 6
LOS	26,2 +/- 30,7 [1]	10 +/- 11,58	22,38 +/- 18,42 [1]
Mortality	38,9% *	10,5%	46,15% *
VAP	14 *	1	11 *
S. Aureus NP onset (days)			3 +/- 3,69
Pseudomonas A NP onset (day	17,9 +/- 28,1		7,5 +/- 8,1

*[1]: p < 0.01 vs NIV; *: p < 0.05 vs NIV*

CONCLUSION. VAP,serious complication of MV, can be reduced by early NIV.In our ICU when NIV fails,probability to develop NP sustained by S.Aureus is high.Reasons for this have to be elucidated.

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DOES CHRONIC USE OF ANTI-ULCER DRUGS PROTECT AGAINST S. PNEUMONIAE PNEUMONIA?

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INTRODUCTION. Anti-ulcer drugs (AUD) are applied in various settings for preventing gastric ulcers by suppressing acid secretion in the stomach. Despite widespread application, there have been concerns about the safety of AUD. First, by increasing the gastric pH, bacterial overgrowth is promoted [1]. Moreover, AUD have been shown to have immunomodulating properties [2]. We studied the microbial patterns of patients with community-acquired pneumonia (CAP) and hospital-acquired pneumonia (HAP), admitted to the ICU for mechanical ventilation.

METHODS. Patients with CAP and HAP, admitted within a 2-year period, were selected from our ICU registry. Patients were excluded from analysis if pretreated with antibiotics for 3 or more days. Sputum cultures were compared between those with chronic use of AUD and those without. Fisher's exact tests were performed to demonstrate differences in microbial patterns.

RESULTS. 178 patients were diagnosed with pneumonia, 37 were excluded because of prior antibiotic treatment. Twenty-seven of the remaining 141 were on chronic use of AUD. There were no significant differences in demographic features, particularly not in patient origin [no AUD vs. AUD]: home/ER 58 (50%) vs. 8 (30%), ward 43 (38%) vs. 12 (44%), other hospital 13 (11%) vs. 7 (26%). There were 111 patients with a positive culture, 29 were culture negative. Patients with AUD had similar microbial patterns as patients without AUD: *P. aeruginosa* 10 (8.8%) vs. 6 (22%), *H. influenzae* 19 (17%) vs. 4 (15%), *K. pneumoniae* 8 (7.0%) vs. 2 (7.5%), *E. coli* 10 (8.8%) vs. 1 (3.7%), Enterobacter spp. 18 (16%)vs. 3 (20%), *S. aureus* 13 (11%) vs. 4 (15%). Patients with AUD were less likely to have a positive culture of *S. pneumoniae*: 22 (19%) vs. 0 (0%), p<.01.

CONCLUSION. Treatment with AUD is not associated with an altered microbial pattern of CAP and HAP. Interestingly, we found a potentially protective effect of AUD on *S. pneumoniae* pneumonia. Further research is needed to elucit the (immuno)pathologic mechanisms of pneumonia with chronic use of AUD and to investigate whether AUD protect against *S. Pneumoniae*.

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THROMBOCYTOPENIA IN INTENSIVE CARE UNIT ACQUIRED PNEUMONIA

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INTRODUCTION. Intensive Care Unit Acquired Pneumonia (ICUAP) is the most frequent infection among patients receiving mechanical ventilation and has an important impact on patient mortality. Thrombocytopenia is one of the most common laboratory abnormalities in Intensive Care Unit (ICU). Thrombocytopenic patients are shown to have higher mortality rate and longer hospital stay. The aim of this study was to evaluate the relation between platelet (plt) count and ICUAP.

METHODS. Medical records of 41 pulmonary ICU patients having at least one ICUAP were reviewed. The date of first ICUAP, etiologic pathogens, plt count at admission, the lowest value within 7 days before and after the date of ICUAP, maximum plt count during ICU stay, development of thrombocytopenia (defined by a plt count <100 x103/mm3), acute physiology and chronic health evaluation (APACHE) II scores, medications and events that can effect plt count and other laboratory values were noted.

RESULTS. The most common etiologic factors were COPD and community-acquired pneumonia in 41 patients aged 70.4±13. Mean time for the first ICUAP was 13±10.3 days. The least plt count associated with ICUAP (LPCA- ICUAP) was seen on 12.1±11.3 day with a significant decrease when compared to admission plt count (30% decrease) and to the maximum plt count seen during ICU stay (58% decrease) (plt counts are 157.2±87.4x103/mm3, 224.1±106.3x103/mm3, 331.3±109.5x103/mm3 respectively, p<0.001). There was a significant negative correlation between the LPCA-ICUAP and APACHE II scores on ICUAP date (r=-0.36, p<0.05). No significant difference was found in plt counts between the patients with ICUAP caused by gr (+) microorganisms when compared to ICUAP caused by gr (-) microorganisms. Patient with normal leucocyte counts during ICUAP had lower LPCA-ICUAP when compared to patients with leucocytosis. 15 patients had an episode of thrombocytopenia during their ICU stay and these patients had higher mortality rate than nonthrombocytopenics (p=0.05).

CONCLUSION. Besides the proven role of thrombocytopenia in prognosis in ICU, plt counts can be an early marker and relative diagnostic criteria for ICUAP.

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AWARENESS OF SEMI-RECUMBENT POSITION AND VENTILATOR-ASSOCIATED PNEUMONIA

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INTRODUCTION. It has been demonstrated that one of the most important measure which reduces the incidence of ventilator-associated pneumonia (VAP) is the semi-recumbent position of the bed.
To evaluate the incidence of semi-recumbent position in ventilated patients in our ICU

METHODS. Our ICU has 12 adult-beds. We have studied the opportunities of semi-recumbent position in patients under mechanical ventilation. We defined a position of 45° as the cut point among semi-recumbent and non semi-recumbent position. The patients were checked twice a day, by the same physician, to reduce the chance of error

RESULTS. We studied 301 opportunities in 30 patients under mechanical ventilation. Unfortunately, we found a position below 45° in 80% of opportunities. 77% of these patients developed ventilator-associated pneumonia

CONCLUSION. To keep the patient under mechanical ventilation in a semi-recumbent position is very easy. Unfortunately our doctors and nurses are not awareness with this practice, although all of them know the rationale and advantages. If this is responsible for our high rate of VAP, it is not proved, but it is possible. This year, we have started a program to guarantee the semi-recumbent position in all our ventilation patients

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SHOCK AND HEMODYNAMIC MONITORING: A PROFILE OF THE DAILY MEDICAL PRACTICE IN BRAZIL

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INTRODUCTION. Shock is a commune diagnosis in the intensive care unit. In spite of guidelines for management of shock and invasive haemodynamic monitoring, the diverse background of intensive care and emergency physicians still generates several ways of treatment. Objective: To demonstrate the portrait of the daily practice of intensive care and emergency physicians in the management of shock e invasive haemodynamic monitoring

METHODS. Application of a questionnaire containing 9 basic questions about diagnosis and treatment of shock and hemodynamic monitoring to intensive care and emergency physicians.

RESULTS. 50 physicians answered the questionnaire; the age varied of 21 to 55 years, mode 28; 36% (18) female and 64% (32)male. All doctors were working at intensive care units or emergency rooms; the average of unstable patients seeing weekly varied from 1-4 on 38 (76%) of the responses and 5-10 on 12 (24%); 33 (66%) indicated pulmonary artery catheter as form of monitoring, 28(56%) central venous pressure and 25 (50%) invasive arterial pressure. The pulmonary artery catheter was indicated as method of diagnosis of the shock on 27 (54%) of the responses, for treatment of cardiac dysfunction on 9 (18%), persistent shock 7 (14%) and to guide volemic reposition on 7 (14%). 22 (44%) of the physicians pointed parameters of tissue oxygenation as a goal of the treatment and 28 (56%) pointed haemodynamic parameters; 39 (78%) uses tissue oxygenation values during treatment: 24 (48%) of them use the arteriovenous oxygen difference followed by venous oxygen saturation SvO_2 on 14 (28%); 29 (58%) do not utilize lactate at any situation and those who does, do not repeat the measurement. The vasoactive drug used at the beginning of shock treatment was norepinephrine 34 (68%), dopamine 14 (28%) and dobutamine 2 (4%).

CONCLUSION. Considering the differences of background of emergency and intensive care doctors in Brazil, the management of shock and haemodynamic monitoring still remains variable, in spite of frequent papers of guidelines by specialized and scientific journals.

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CRITICAL CARE ADMISSION MICROALBUMINURIA PREDICTS INOTROPE REQUIREMENT AND ORGAN DYSFUNCTION

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INTRODUCTION. Low level albumin excretion (microalbuminuria) on admission to ICU shows promise as an early indicator of patients at risk of organ failures and death (1,2). This preliminary report compares bedside point of care urine albumin with Sequential Organ Dysfunction Assessment (SOFA) score, ICU mortality and vasopressor/inotrope requirements.

METHODS. Urine albumin, expressed as the albumin creatinine ratio (ACR) in mg/mmol (normal < 2.3) was measured by nursing staff using a bedside point of care system (DCA 2000, Bayer Diagnostics Ltd) within 15 minutes of admission (ACR 1) and again 4-6 hours later (ACR 2) in 51 medical and 64 surgical patients.

RESULTS. Median (95% CI) ACR fell from 11.2 (7.9-15.5) on ICU admission, to 5.6 (4.6-8.8) mg/mmol 4-6 hours later (p=0.0117 Mann Whitney). ACR 1 was significantly correlated with admission SOFA score (rs=0.26 p=0.0059). Median ACR 2 for 25 non-survivors was 13.6 (4.8-21.4) and for 90 survivors 4.9 (3.8-7.5) mg/mmol respectively (p=0.0185). Median ACR 1 for 20 patients who required vasopressor/inotropic therapy was 24.0 (10.3-37.6) mg/mmol compared with 8.6 (5.5-13.8) mg/mmol for the 95 patients who did not require vasopressor/inotropic support. (p=0.0084). The areas under the Receiver Operator Characteristic curves for predicting vasopressor/inotropic requirement for ACR1 and SOFA score were 0.713 (95% CI 0.602-0.823: p<0.0001) and 0.868 (95% CI 0.796-0.930: p<0.0001) respectively.

CONCLUSION. These preliminary data suggest that bedside point of care assessment of microalbuminuria within 15 minutes of ICU admission, is associated with later organ dysfunction and that the mechanism of this association may involve loss of microvascular patency.

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SUBCLAVIAN VEIN CATHETERIZATION IN INTENSIVE CARE UNIT PATIENTS: EXPERIENCE IN ONE CENTER

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INTRODUCTION. Central venous catheterization is required in many critically ill patients in order to administer total parenteral nutrition, hemodialysis, long-term antibiotics or to manage hemodynamic disorders. The subclavian vein route is preferred to other central venous accesses because it is associated with a lower rate of catheter-related infection and thrombosis. As a quality assurance measure to determine the safety of subclavian vein catheterization (SVC) we reviewed the records of all patients in our department between 5th May, 2001 and 24th February, 2003.

METHODS. The charts of 211 patients were reviewed retrospectively. Age, gender, underlying disease, the side of venipuncture, indication of SVC, the rank of the operator, complications, infections, duration of catheter and need for mechanical ventilation reviewed for each patient.

RESULTS. Two hundred eleven patients (83 females 39.3%) were catheterized. The patients' ages ranged from 1 to 90 years (59 ± 25 years) and weight ranged from 1 to 120 kg (65 ± 23 kg). Platelet count was 203 ± 134 x109 liter-1. Prothrombin time (PT) was 18.5 ± 12.4 s and activated partial thromboplastin time (APTT) was 36.6 ± 22.9 s. One hundred ninety-six SVCs (91.7%) were achieved without adverse events. Among the remaining 15 SVC catheterizations, 8 (4.5%) misplacements of the catheter, 4 (2.2%) pneumothoraces, and 3 (1.6%) arterial punctures occurred. Compared with left-sided venipuncture the rate of catheter tip misplacement was significantly higher when right-sided venipuncture was performed (1 versus 7 misplacements, p<0.05).The most frequent site of catheter tip misplacement was internal jugular vein (6) followed by opposite subclavian vein (2).

CONCLUSION. According to our findings immediate complications of subclavian vein catheterization in intensive care units are uncommon, and in case of subclavian catheterization left-sided venipuncture should be considered in order to avoid malposition.

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WHAT HAS HAPPENED TO THE COLLOID? PLASMAVISCOSITY AS TOOL TO NOTICE INTERACTIONS

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INTRODUCTION. Rheology is affected by the infusion of colloids in different ways. It is not known whether the mixture of blood and colloid is responsible for these effects alone. The comparison between plasmaviscosity of in-vivo and in-vitro hemodilution should answer if differences can be noticed between these two hemodilution ways.

METHODS. 8 healthy pigs were investigated for these study. Gelatinesuccinat 4% were infused i.v. with the amount of 30 ml/ kg body weight over a period of half an hour in each group.
Hematocrit were measured before and after this in-vivo-hemodilution. Another blood sample was in-vitro diluted down to the same hematocrit as the in-vivo-hemodilution by addition of the calculated volume of colloid. Plasmaviscosity was determined before and after in-vivo and in-vitro hemodilution.
Statistics (Average +/- standard deviation) were determined for the following parameters: 1) Hematocrit before and after in-vivo-hemodilution 2) Plasmaviscosity before and after in-vivo and in-vitro hemodilution Furthermore the correlation coefficient between in-vivo and in-vitro hemodilution was calculated.

RESULTS. Hematocrit decreased from 28,4 +/-2,7 % to 17,9+/-2,5 % (p<0,05).
Plasmaviscosity changed from 1,14+/-0,077 mPas before hemodilution to1,16+/-0,033 mPas after in-vivo-hemodilution respectively to 1,20+/-0,054 mPas after in-vitro-hemodilution. All differences were significant (p<0,05). The rang correlation between in-vivo and in-vitro plasmaviscosity was r=0,26 (p= 0,48).

CONCLUSION. After in-vitro hemodilution with gelatinesuccinat 4% (Viscosity 1,40 mPas) plasmaviscosity is higher than under same in-vivo conditions. This and the missing correlation between in-vivo and in-vitro plasmaviscosity show that under in vivo conditions other factors influence properties of hemodiluted blood.

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USE OF HIGH DOSES OF CATECHOLAMINES IN DONORS AND ACUTE ALLOGRAFT REJECTION IN CARDIAC RECIPIENTS

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INTRODUCTION. Recently, it has been described that the use of catecholamines (CAT) in the donor reduces acute allograft rejection (AAR) episodes in the renal graft. There are no similar studies on cardiac transplantation (CTx); for that reason, our objective was to analyze this finding on cardiac recipients.

METHODS. Prospective and descriptive study carried out from January-1996 to December-2001 on cardiac recipients whom received their graft from donors managed in our hospital. We defined high doses of catecholamines (HDC) in accordance to Stanford Criteria: dopamine > 10 g/Kg/min and/or any dose of norepinephrine. AAR was defined as any episode that required to be treated. We analyzed: a) In the donor, the dose of CAT before and after the brain death (BD); b) In the recipient: 1) Age; 2) Sex; 3) Number of episodes of AAR at one and twelve months; 4) Time from transplantation procedure to the first episode of AAR; 5) Related mortality to allograft rejection at one and twelve months.

RESULTS. In the study period we had 31 cardiac donors: 16/31 (52%) needed HDC before BD and 27/31 (87%) after BD. Twenty seven transplantations were performed (6 outside our hospital) from donors that receipt HDC. Three recipients were excluded from the study because they died during the perioperative period (1 early graft failure, 1 sepsis, 1 surgical complication). In the 24 remaining recipients: 1) Age: 49±14 years (range: 17-65); 2) Women 3/24 (12.5%); 3) Eight of 24 (33%) of the CTx had at least one AAR episode in first month and 14/24 (58%) into the first year; 4) First episode of AAR arose at 52±45 days (range: 13-149). 5) The mortality rate was 0% at first month and 4% (1/24) at one year.

CONCLUSION. In our series, the incidence of acute allograft rejection at one and twelve months is similar to the published in other series. It is observed a delay in the appearance of the first episode and a low mortality rate at one and twelve months, which is inferior to the expected (1). These findings would have to be evaluated in other studies.

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HEART GRAFT PROCUREMENT IN MULTIORGAN DONATION

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INTRODUCTION. The aim of our study was to evaluate the capacity of heart donation in multiorgan donors and to analyse the causes of exclusion for the procurement of the heart graft.

METHODS. Prospective and descriptive study, including all the donors of our hospital, carried out from 1996 to 2002. In our management protocol is required: To maintain a central venous pressure between 3-10 mmHg; volume reposition according to hourly urinary output; desmopressin administration to control diabetes insipidus, and the employment of dopamine and/or norepinephrine, without dose restriction, to maintain a mean arterial pressure between 70-100 mmHg. Heart donors selection criteria were: 1) Age: men < 50 years, women < 55 years; 2) Absence of underlying cardiac illness; 3) Normal echocardiogram; 4) Intraoperative heart graft inspection without abnormalities.

RESULTS. We had 101 donors in that period. Their mean age was 49±18 years (range: 16-78). The causes of brain death were severe head injury (29 patients), subarachnoid hemorrhage (SAH) (18), intraparenchymatous cerebral hemorrhage (36), ischemic stroke (13) and other causes (5). Fifty two patients met the age criteria. Six of these 52 candidates were excluded due to a known cardiomyopathy. Finally, 46/101 (46 %) donors were evaluated and analyzed. Their mean age was 33±12 years (range 15-55). Of these 46 candidates to donate their heart, 12 (26%) were discarded because of: Lack of adequate recipient (2 donors); poor ventricular function (6 donors; 4 detected by echocardiography and 2 during the intraoperative inspection), and refused during the explantation procedure (4; 2 suffered from cardio-pulmonary arrest while harvesting, 1 septic donor and the last one due to coronary artery disease). Four of the 6 donors, excluded because of ventricular dysfunction, died as a consequence of severe head injury (two with concurrent thoracic trauma) and 2 due to SAH. Thirty four heart transplantations were performed along the study period, and only two recipients developed early graft failure.

CONCLUSION. One of each three multiorganic donors fulfilled the criteria for being an adequate cardiac donor. Only 6 (13%) of the candidates to heart donation were refused as suitable donors due to ventricular dysfunction. In 4 (9%) of these 6 candidates, the neurogenic origin could be the responsible of such ventricular dysfunction.

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PROLONGATION OF INTRA- AND INTERATRIAL CONDUCTION AS PRDICTOER OF ATRIAL FIBRILLATION AFER CABG

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INTRODUCTION. Atrial fibrillation frequently occurs in patiens (pts) after GABG. It is associated with increased morbidity and prolonged hospital stay. Age, arterial hypertension and a previous history of atrial fibrillation are well known risk factors for postoperative atrial fibrillation after cardiovascular surgery. Simple electrocardiographic measurements such as P- wave dispersion might add to early risk assessement of atrial fibrillation after CABG.

METHODS. In a consecutive case controlled study preoperative surface 12 lead ECGs were obtained from patients undergoing CABG(25 mm/sec and 1mV/cm standardization). Measurements of P- wave duration were performed manually by the investigators using calipers and a magnifying lens.The difference between the maximum and minimum P-wave duration was defined as P-wave dispersion, a marker of the nonuniform inhomogeneous atrial conduction. The interobserver mean percent error was less than 5% for P max. and less than 6 % for P min. (calculated as absolute difference between two oberservations divided by the mean).

RESULTS. In addition to the well established risk factors such as age, P – wave dispersion (RR 5.4) and off-pump CABG-surgery (RR 1.8) seem to be associated with the occurrence of postoperative atrial fibrillation.

	no afib (n=29)	afib (n=26)	p-values
Age (years, mean +/-)	63 +/- 9	69 +/- 9	0.02
Men n (%)	23 (79%)	22 (85%)	0.6
EF preop.(%,mean +/- 1STD)	57 +/- 17.6	61 +/- 13	0.2
Art. Hypertension n (%)	22 (76%)	20 (77%)	0.9
Off-pump-surgery n (%)	23 (79%)	26 (100%)	0.001
P-dispersion (sec.)	0.003	0.005	<0.0001

CONCLUSION. Perioperative antiarrhythmic treatment in pts with increased P- wave dispersion might reduce the frequency of atrial fibrillation after CABG. This will be tested in a prospective study examining the left atrial mechanical function by transoesophageal echocardiography with and without antiarrhythmic treatment.

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ACTIVATION OF THE ATP-DEPENDENT POTASSIUM CHANNEL ATTENUATES NORADRENALIN-INDUCED VASOCONSTRICTION.

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INTRODUCTION. In patients with septic shock, the decrease in blood pressure is mainly due to vasodilation. Besides increased NO production, vascular potassium channel activation appears to play a role. In animal experiments potassium channels are upregulated during sepsis, and systemic administration of glibenclamide (blocker of the ATP-dependent K-channel) is able to increase blood pressure. Activation of potassium channels results in potassium efflux, membrane hyperpolarisation, closure of voltage-dependent calcium channels and a decrease of intracellular calcium. Refractory hypotension and insensitivity to noradrenalin is a clinical problem. Aim of present study was to investigate the effect of vascular potassium channel activation on noradrenalin sensitivity in the perfused forearm of healthy volunteers.

METHODS. After written consent, forearm blood flow was measured in both arms using strain-gauge venous occlusion plethysmography in 10 healthy non-smoking volunteers. The left arteria brachialis was cannulated for continuous blood pressure measurements and intra-arterial drug administration. Forearm blood flow was increased with SNP (as NO donor, 2 mug/min/dl) after which a noradrenalin dose-response curve was constructed (10-30-100-300-1000 ng/min/dl, SNP infusion continued). After an equilibration period of 45 minutes, baseline forearm blood flow was determined again and then forearm blood flow was increased with intra-arterial administration of diazoxide (an ATP-dependent potassium channel activator, 1 mg/min/dl) after which the noradrenalin dose response curve was repeated (diazoxide infusion continued).

RESULTS. Intra-arterial SNP infusion increased forearm blood flow from 2.8±0.7 to 9.4±1.5 ml/min/dl, subsequent noradrenalin infusion increased forearm vascular resistance from 13.2±3.7 AU to 248.7±45.0 AU at the highest noradrenalin infusion. Intra-arterial diazoxide infusion increased forearm blood flow from 2.2±0.3 to 6.8±1.0 ml/min/dl, subsequent noradrenalin infusion increased forearm vascular resistance from 17.8±5.3 AU to 50.5±6.2 AU.

CONCLUSION. Vasodilation induced by K ATP-channel activation is associated with a reduced sensitivity to noradrenalin as compared with vasodilation induced by nitroprusside. In accordance with animal experiments, this indicates that potassium channel activation could account for the diminished noradrenalin sensitivity in septic patients.

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OXYGEN EXTRACTION IS NOT IMPAIRED DURING ENDOTOXEMIA

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INTRODUCTION. Sepsis may impair O2-extraction. The relevance of this should be evident in high O2-demand. Malignant hyperthermia increases the O2-demand. We assessed the effect of endotoxemia on O2-extraction in hyperthermic pigs.

METHODS. Anesthetized pigs were randomized to receive either endotoxine (E;n=8) or saline infusion(C;n=8). We measured systemic (thermodilution) and superior mesenteric, hepatic, carotid artery, celiac trunk and portal vein blood flow (ultrasound Doppler), oxygen transport and lactate exchange at baseline and after 3 and 18 hours of endotoxin infusion. Baseline filling pressures were maintained with fluids. Friedman Test was used to assess changes over time.

RESULTS. Six E and 5 C pigs survived until the end of the experiment. High baseline systemic and regional O2-extraction was maintained throughout the experiment in both groups despite hypotension (E and C) and decreased stroke volume in E. Hepatic lactate exchange decreased in E from 15 (10-28) to 2 (–5-12) mol/min (median, range, p<0.05), and remained stable in C (11 (5-34) to 12 (6-16)).

	baseline E	baseline C	3 hours E	3 hours C	18 hours E	18 hours C
Systemic O2 extraction %	55 (45-73)	70 (49-83)	70 (48-84)	70 (60-76)	62 (48-81)	58 (50-64)
Hepatosplanchic O2 extraction %	78 (54-84)	76 (58-87)	86 (63-95)	72 (59-90)	76 (55-94)	72 (56-74)
Systemic O2 consumption ml/kg/min	6.5 (4.4-8.0)	7.9 (5.1-11.6)	6.0 (4.9-7.7)	7.2 (6.3-8.8)	6.2 (4.1-6.8)[a]	7.8 (7.0-9.1)
Hepatosplanchic O2 consumption ml/kg/min	1.9 (1.6-3.3)[a]	2.3 (2.1-5.6)	2.0 (1.1-2.6)	2.4 (2.0-3.1)	1.9 (1.3-2.3)	2.5 (1.5-2.9)
Stroke Volume ml/kg	0.78 (0.60-1.22)	0.99 (0.5-1.15)	0.52 (0.36-0.65)[a]	0.74 (0.56-1.19)	0.69 (0.45-1.02)[a]	1.05 (0.84-1.09)
Mean Arterial Pressure mmHg	70 (53-84)	74 (49-80)	70 (51 - 78)	62 (48-74)	46 (26-66)[b]	49 (43-65)

a = p<0.05 between groups (Mann-Whithney U); b = p<0.05 vs baseline (Wilcoxon)

CONCLUSION. In the present septic model there was no evidence of an impaired hepatosplanchnic or systemic oxygen extraction. Despite maintained hepatosplanchnic oxygen consumption, hepatic lactate clearance decreased, suggesting altered metabolic activities independent on oxygen consumption.

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DISSOCIATION BETWEEN REGIONAL VASCULAR RESISTANCE AND BLOOD FLOW CHANGES IN SEPSIS AND HYPERTHERMIA.

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INTRODUCTION. Abnormal vasoregulation is a hallmark of sepsis. Since inadequate splanchnic perfusion may contribute to sepsis-induced multiple organ failure, vasoregulation in this region is of particular interest. Hyperthermia itself may change vascular reactivity. The aim of this study was to evaluate effects of sepsis and malignant hyperthermia on vascular resistance (VR) in the gut, spleen, liver, kidney and brain.

METHODS. Anesthetized pigs were randomly assigned to 18 hours of either endotoxin (E;n=8) or saline infusion (C;n=8). Systemic (CO; thermodilution) and carotid, superior mesenteric (SMA), hepatic and renal artery and portal vein blood flow (ultrasound Doppler) and blood pressure were measured and the respective VR calculated at baseline and after 1.5, 3, 6, 12 and 18 hours.

RESULTS. Six of E and five of C animals survived until the end of the experiment. At baseline, spleen flow was higher in E and hepatic arterial flow higher in C. In E, CO, SMA and portal vein blood flow increased (all p<0.05), while carotid, hepatic, spleen and renal blood flow did not change. In C, spleen flow increased, kidney flow decreased (both p<0.05) and all other flows remained unchanged. In E, systemic and all regional but renal VR decreased while in C only carotid and spleen VR decreased.

VR (mmHg·kg·min·L-1),values are median (range)

	Systemic	Carotid	SMA	Portal	Hepatic	Spleen	Renal
Baseline E	70 (53-84)	16 (11-27)	4 (3-7)	3 (2-5)	17 (12-116)	30 (22-135)	14 (6-33)
Baseline C	74 (49-80)	15 (11-23)	3 (3-12)	3 (2-4)	8 (3-17)	57 (32-197)	10 (7-32)
18 hours E	46 (26-66)[a]	8 (5-14)[a]	2 (1-4)[a]	1 (1-2)[a]	15 (8-19)[a]	26 (11-391)[a]	8 (6-28)
18 hours C	49 (43-69)	9 (14-17)[a]	3 (1-5)	1 (1-4)	7 (4-18)	22 (4-78)[a]	9 (5-24)

a=P < 0.05, Friedman Test.

CONCLUSION. During endotoxemia only mesenteric and portal blood flow increased together with cardiac output, despite a decrease in vascular resistance in all regions but the kidney. Sepsis and hyperthermia may modulate pressure-flow relationship differently in regional vascular beds.
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GOODNESS OF FIT OF LOGISTIC FUNCTION TO ISOVOLUMIC RELAXATION PRESSURE CURVE IN EXCISED CANINE HEART

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INTRODUCTION. We have found that a logistic function fits the arbitrarily selected isovolumic relaxation pressure curve with different cut off points better than the monoexponential function that Weiss, et al originally proposed in 1976 1), 2). To scrutinize this fitting in the present study, we investigated the relations of changes of the cutoff point in the logistic fitting in comparison with the monoexponential fitting at a fixed set of preload, heart rate, and temperature in the excised canine heart.

METHODS. Left ventriclar (LV) volume was fixed at 14ml, heart rate at 120 beats/min and LV temperature at 36 ^{O}C in eight excised, cross-circulated canine hearts. The cut off point was advanced from the end-point of the isovolumic relaxation for zero developed pressure to 5 % and 10 % higher developed pressure levels (cut off point 0, 5, and 10 %, respectively). We fitted both a logistic function equation: $P(t) = P_A/[1 + \exp(t/tau_L)] + P_B$ and a monoexponential function equation: $P(t) = Po*Eexp(-t/tau_E)] + P\_‡$ to the isovolumic relaxation pressure curves from the peak -dP/dt to the three different cutoff points by the least squares method. We compared the goodness of the logistic and monoexponential fittings to the same isovolumic relaxation pressure curves at the respective cut off point in terms of correlation coefficient (r) and residual mean square (RMS: residual sum of squares divided by the residual degrees of freedom).

RESULTS. The r values of the logistic and mono-exponential fittings were 0.9997 and 0.9976, 0.9999 and 0.9992, and 1.0000 and 0.9996 at cutoff points of 0, 5, and 10 %, respectively. RMS values of the logistic and mon-oexponential fittings were 0.078 and 0.560, 0.017 and 0.172, and 0.008 and 0.087 $(mmHg)^2$, respectively.

CONCLUSION. These results corroborate that the logistic function always fits the isovolumic relaxation pressure curve much more precisely than the mono-exponential function at any cut off points in the isovolumically contracting canine heart.

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AUTONOMIC DYSFUNCTION AT ICU ADMISSION IS A BAD PROGNOSTICATOR FOR SURVIVAL

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INTRODUCTION. Power spectral analysis (PSA) of the beat-to-beat heart rate (HR) has proven to be a particularly convenient and reproducible method of characterizing the relative contributions of the sympathetic (SNS) and parasympathic (PNS) nervous system in several diseases in humans. PSA separates PNS form SNS effects. High frequency (RRHF) components (0.20-0.40 Hz) are related to the respiratory sinus arrhythmia and are an index of PNS. Low frequency (RRLF) components are an index of SNS. The RRLF to RRHF ratio (RRLFHF) can been used as a marker of autonomic nervous system activity. We studied the relation between parameters of autonomic function in relation to survival in critically ill patients.

METHODS. ICU patients with a treatment duration > 48 hrs in a period of one year were included in the study. Patients with a known history of diabetes mellitus, chronic renal disease, neuropathy or autonomic disturbances, hypertension, or cardiac disorders were excluded. Patients received sedatives and vasoactive agents as clinically indicated. All patients were analysed for 150 sec in supine position during stable hemodynamics in the first 24 hours of ICU treatment. After acquisition of the ECG the beat-to-beat RR-interval (HR) was calculated. With the use of power spectral analysis it is possible to obtain the RRLF component and the RRHF component. RRLFn and RRHFn were calculated as percentage of the total power. Subsequently the ratio between the RRLF and RRHF was calculated.

RESULTS. In the study period we measured a total of 200 patients. Due to poor quality of one or more of the variables studied, datasets from 148 patients were excluded. Data from 52 patients, 37 male and 15 female, 38 survivors (NSUR) and 14 non-survivors (NSUR), mean age 58±15 yr (18-78 yr), mean apache II score 16±8 (2-41), were included. The RRLFn values were lower in NSUR (16±14) than in SUR (68±22) P<0.001. The RRLFHF was lower in NSUR (0,25± 0,34) than in SUR (4,4±4,9) P<0.001. In sepsis patients (N=24), RRLFn was lower (43±33) than in non sepsis patients (N=28; 63±26; p=0.022). In addition, RRLFHF was lower in sepsis (2,2 +/- 3,3) than in non-sepsis patients (4,1±5,5; P=0,038).

CONCLUSION. In non survivors of critically illness the sympathetic modulation of heart rate was depressed as shown by a reduced or absent LF component. Furthermore RRLFHF (indicator of autonomic balance) seems to be a bad prognosticator for survival.

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INTRAABDOMINAL PRESSURE INFLUENCE ON CHANGES ON RESPIRATORY AND HAEMODYNAMIC FUNCTIONS

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INTRODUCTION. Intraabdominal Pressure (IAP) monitoring could be helpful in understanding changes in respiratory and haemodynamic function in patients after abdominal surgery, and it could have an eventually prognostic relevance. The aim of this study is ascertain IAP influence on this assessment in patients with abdominal wall integrity (non operated).

METHODS. Seventeen sedated and mechanically ventilated patients (14 male and 3 female) admitted to our ICU because of different reasons (none of them abdominal surgery) were included in the study. Mean age was 59 ± 15 years and weight was 80 ± 13.5 kg. IAP was periodically measured using the intra urine bladder modified Kron´s method, and an increase in such IAP was induced by means of a weight placed on patient´s abdomen up to a value that doubles basal measurements. Respiratory variables collected were tidal volume, dynamic compliance and airway pressures. Gas exchange parameters and haemodynamic values (central venous and arterial pressure -systolic, diastolic and mean- and heart rate). Every patient has and indwelled arterial catheter for sampling and monitoring. PEEP was increased during the study from basal values to a maximum of 15 cmH_2O. Significance tests were accepted as positive if p<0.05.

RESULTS. Mean weight placed on the abdomen was 7.9 ± 2.1 kg and IAP rose from 6.7 ± 4.1 to 13.4 ± 4.4 mmHg. Values of RR, tidal volume, FiO_2 and vasoactive drugs doses (dopamine 6 cases, dobutamine 2 cases and norepinephrine 2 cases) were kept stable during the study. An increase in IAP caused significant changes on ventilatory dynamics (compliance and airway pressures) with no change in gas exchange values. From a haemodynamic standpoint only CVP raised (never over 11 mmHg) with no change in other parameters.

CONCLUSION. In mechanically ventilated patients with non-operated abdomen, a rise in IAP up to a double of basal values causes changes in ventilatory dynamics with no change in oxygenation or ventilation functions. CVP is also affected, but no other haemodynamic value. Under these circumstances an increase of PEEP caused non-statistically significant changes in paO_2 and pulmonary compliance.

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IMPAIRED MICROCIRCULATION INDUCED BY MARATHON RUNNING

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INTRODUCTION. Marathon running can induce a systemic inflammatory response syndrome (SIRS) and may result in multiple organ dysfunction syndrome and death. Orthogonal polarisation spectral (OPS) imaging is a method to visualise the microcirculation. In septic shock patients, the shutdown of microcirculatory perfusion has been shown to be reversible by volume resuscitation and nitroglycerin [1]. We tested the hypothesis that marathon running might be a suitable experimental human model for the induction of SIRS with a disturbed microcirculation due to intravascular dehydration.

METHODS. Four male runners, aged 32, 34, 38, and 43 years, participated in the Amsterdam half marathon in October 2002. Before the start of the race and within 2 minutes after the finish, body weight, heart rate, blood pressure, and sublingual OPS were determined. In 2 runners, OPS imaging was also performed 30 minutes after the finish, after resuscitation with oral fluids. The OPS images were assessed by a blinded investigator. In small (diameter: 10-25 m), medium (25-50 m), and large (50-100 m) sized vessels, the microcirculatory flow index (MFI) was calculated on the basis of semi-quantitative scoring.

RESULTS. The runners finished the half marathon in 1:44:38 (hr:min:sec), 1:46:23, 1:38:10, and 1:41:21, respectively. After the race, mean heart rate was increased (106 vs 68/m; p<0.001), mean systolic blood pressure decreased (142 vs 119 mmHg; p=0.009), and mean body weight decreased (75.2 vs 73.6 kg; p=0.003). The body weight loss varied from 1.2-2.0 kg. OPS imaging revealed a decreased MFI in 3 runners, irrespective of vessel size (p=0.01), and a slightly increased MFI in 1 runner. Resuscitation with 660 ml of cola and 1000 ml of water resulted in a markedly increased MFI in 2 runners (p=0.042).

CONCLUSION. Marathon running results in an impaired sublingual microcirculation. Resuscitation with oral fluids normalised the microcirculation in 30 minutes. Marathon running might be a good experimental model for SIRS. Impaired microcirculation as measured by sublingual OPS is not specific for disease, but probably more for redistribution of flow.

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OUTCOMES FOR PATIENTS WITH CHAGAS DISEASE UNDERWENTING MAJOR GASTROINTESTINAL SURGERIES.

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INTRODUCTION. Gastrointestinal dysfunction is a major problem for many patients with chronic Chagas(1) disease, as are cardiac dysrhythmias and cardiomyopathy. Many patients present a non-cardiac form. They have positive-specific serology tests but no signs of myocardial dysfunction. Therefore we sought to determine if these patients had a higher risk of morbimortality during major non-cardiac surgery.

METHODS. We retrospectively evaluated 91 consecutive patients who underwent major ablative gastrointestinal surgeries for esophagus or colon. Surgeries were performed for carcinoma, chagasic megaesophagus or megacolon,. We considered any life-threatening event occurring from surgery to hospital discharge as a major complication. Twenty-eight days mortality rate was evaluated using Kaplan-Meyer curve and a log rank test.

RESULTS. Out of 91 patients, 45 (49%) had positive-specific serological test (Group I) and 25 (28%) had negative tests (Group II). In 23% the test was not performed. Patients in group I had a significantly lower MAP on ICU admission day compared to group II (71 ± 13 mm Hg vs 86±11 mm Hg). Neoplasia was present in 9% and 60% of the patients in groups I and II, respectively (RR 0.15 CI 95% 0.05-0.39). Major complications occurred more frequently in group I than in group II (septic shock, 9% vs 4%; arrhythmia, 4.5% vs 0%, group I vs group II, respectively, NS). In group I, a fatal case of intestinal thrombosis occurred and another patient did not survive the surgery (unknown cause). Mortality rate was higher in group I than in group II (20% vs 8%, p=0.01).

CONCLUSION. These results suggest trends toward a higher morbimortality in this small series of patients with non-cardiac or indeterminate form of Chagas disease submitted to high-risk surgery. It is possible that these patients do not have cardiovascular reserve when submitted to surgical stress and routine cardiac tests are not appropriate. To our knowledge this issue has not been studied before and a larger trial should be prospectively carried out.

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CAN SURVIVAL CHANCES FOR PATIENTS WITH IRREVERSIBLE CARDIOGENIC SHOCK BE INCREASED ?

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INTRODUCTION. Despite advances in medical technology and therapy, cardiogenic shock (CS) is often irreversible and associated with unacceptable, high mortality rates. To improve survival chances these critically ill patients (pts) should be referred to specialized centers where assessment for further therapies like mechanical circulatory support (MCS) or heart transplantation (HTX) can be performed. To ensure a safe transport of these pts a special emergency transport team was introduced in our clinic in 1991. It consists of 1 intensivist, 1 cardiotechnician and 1 ICU nurse.

METHODS. In a retrospective study we assessed the clinical and the post clinical state of 50 patients (38 male, 12 female, mean age 49 years) who were referred to our center with severe cardiogenic shock from 1998 to 2001. Inclusion criteria was cardiogenic shock with consecutive multiple-organ failure despite inotropic support with at least 2 different inotropes, intraaortic ballon-counterpulsation and /or ECMO. Etiology of CS was acute myocardial infarction in 22 pts, myocarditis in 9 pts, DCM in 12 pts and ICM in 3 pts (rest miscellaneous). 15 pts had been treated with PTCA or thrombolysis in the referring hospital. After admission to our hospital we tried to reverse CS with optimised medical therapy for 24 hours. If unsuccessful the pts were assessed for MCS or HTX.

RESULTS. For transport 23 pts needed IABP support and 8 pts required FFBP. Later a total of 35 pts required IABP and 10 pts FFBP. We initiated MCS in 25 pts; 15 had an LVAD and 10 a BVAD (2 post LVAD). 4 pts could be weaned of their MCS device and 10 pts underwent HTX. Post HTX 2 pts died. Of the 27 pts initially discharged 25 are still alive.

CONCLUSION. The overall long-term survival rate of 50% is encouraging. The pts eligibility for HTX or MCS should be assessed in specialized centers. Transport to the centers can be safer if done by a specialized team. Long-term follow-up data should be registered.

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PULMONARY THROMBOEMBOLISM AMONG ELDERLY INTENSIVE CARE UNIT (ICU) PATIENTS

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INTRODUCTION. Evaluate pulmonary thromboembolism (PE) among patients over 65 years old admitted in an ICU.

METHODS. We studied a prospective cohort enrolling 1993 patients admitted to a clinical ICU (period from March 2000 to February 2003). Fifty two patients with high clinical probability of PE were submitted to several complementary exams like D-dimmer concentration, electrocardiogram, chest radiography, arterial blood gas, echo dopplercardiogram and venous colored echo Doppler. The PE was confirmed in 37 of those patients (which 32 were older than 65 years old) with one of these confirmatory
METHODS. Ventilation-Perfusion Lung Scan with a high probability result (56%), the identification of a clot by Spiral Computer Tomography (41%) or a positive Gadolinium-enhanced Magnetic Resonance Angiography (3%).

RESULTS. The mean age of our patients was 78±5 years old (max= 98) and the mean APACHE II score was 11±6 (max= 20). 84% of our patients were females and the most prevalent risk factors were: age, immobilization (31%), ejection fraction less than 40% (28%), history of deep venous thrombosis (25%), and chronic pulmonary hypertension (16%). The most usual signs and symptoms were: dyspnea (88%), tachypnea (78%), chest pain (34%), sinusal tachycardia (31%), cough and cyanosis (19%). The complementary exams showed the positivity of 94% for D-dimmer, 72% for venous colored echo Doppler, 67% for echo dopplercardiogram, 66% for chest radiography and 40% for electrocardiogram. 38% of the patients showed hypoxemia at the arterial blood gas analysis. Unfractionated heparin was used as the first choice treatment in 72% of the patients and thrombolitic therapy in 19%. No major bleeding episodes requiring blood transfusions were seen. The overall in-hospital mortality rate was 28% (PE + septic shock) and 18% related with PE by itself. The average ICU inmate time was 6±4 (min= 3 and max= 19) and the average time of hospitalization was 12±25 days (min= 4 and max= 143).

CONCLUSION. The authors warn for the necessity of a clinical suspicion of pulmonary thromboembolism as the first step of a differential diagnosis with other prevalent pathologies among elderly, and highlight the good results with therapy, including the thrombolitics.

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BAROREFLEX SENSITIVITY CHANGES AND ADVERSE EVENTS AFTER SPONTANEOUS SUBARACHNOID ANEURYSMAL BLEEDING

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INTRODUCTION. Subarachnoid hemorrhage (SAH) patients frequently demonstrate autonomic dysfunction, e.g. abnormalities in heart rate and blood pressure regulation. This study assessed the spontaneous baroreflex sensitivity (BRS) as a reflection of vagal cardiovascular modulation in SAH patients in relation to adverse events during the ICU stay.

METHODS. Thirteen consecutive SAH patients with no previous history of autonomic dysfunction (e.g. diabetes mellitus, heart failure) were included from day 1 of ICU stay. Spontaneous BRS was recorded each day during the ICU stay. Preset criteria of adverse events included prolonged mechanical ventilation (>1 week) and/or the occurrence of cerebral vasospasm by angiography or transcranial Doppler flowmetry. Patients were divided in groups with any event (group E) or with no events (group N).

RESULTS. No differences between groups were observed at time of inclusion in terms of sex, body mass index and level of consciousness (mean GCS 13 in both groups) and there was no difference in intervention (clipping vs. embolisation). Patients in group E stayed 17.2±2.2 days (discharge mean GCS 9) in the ICU versus 4.9±0.4 days (discharge mean GCS 15) for patients in group N. The mean BRS was significantly depressed compared to the initial value for all patients at day 5. The BRS of group E patients decreased already from day 2, and remained significantly depressed up to ICU discharge whereas group N patients maintained their initial BRS until day of discharge.

Change in BRS relative day 1 (numbers in parentheses are number of patients)

ICU day	1	2	3	4	5	8	11
Group N % of day 1	100±0 (7)	134±30 (7)	107±23 (7)	53±16 (4)	38±7* (3)	n.a.	n.a.
Group E % of day 1	100±0 (6)	73±19* (6)	65±21* (6)	49±17* (6)	26±6* (6)	18±4* (6)	14±5* (6)

*Values are mean±SEM. * p<0.05 by Mann-Whitney´s U-test*

CONCLUSION. An early decrease in BRS is associated with complications during ICU treatment for SAH. The predictive value of BRS regarding complications remains to be further validated.
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CEREBRAL OXYGENATION CHANGES DURING PEDIATRIC SURGERIES FOR CYANOTIC CARDIAC DISEASES

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INTRODUCTION. We reported that changes in the cerebral oxygenation state measured by near-infrared spectroscopy showed uniform patterns during paediatric surgery for ventricular septal defect (VSD) [1]. In this study, we evaluated whether the changes were similar during surgery for cyanotic congenital heart disease.

METHODS. After obtaining institutional approval and parental informed consent, eight paediatric patients (9 months - 6 years old) undergoing the repair of tetralogy of Fallot (TOF) as an example of cyanotic congenital heart diseases were prospectively studied. Anaesthesia was induced with 2 mug.kg^{-1} fentanyl and maintained with sevoflurane and additional doses of fentanyl and midazolam. We used a NIRO 500 spectrometer (Hamamatsu Photonics, Japan) for near infrared spectroscopy. The changes in cerebral oxy- and deoxygenated haemoglobin ([HbO_2] and [Hb]) were measured after setting these values at 0 mumol.L^{-1} at the start of surgery. We extracted the values of 6 points (start of surgery, 5 min before the start of cardiopulmonary bypass (CPB), 5 and 30 min after the start of CPB, 30 min after end of CPB, and at skin closure). We evaluated the changes in cerebral [HbO_2] and [Hb] by one-way ANOVA. When a significant difference was identified the Newman-Keuls test was used.

RESULTS. Arterial oxygen saturation (SaO2) was 87 _} 3% and 99 _} 1% at the start of surgery and at skin closure. [HbO_2] significantly decreased during CPB. After CPB, [HbO_2] increased above 0 mumol.L^{-1}. The pattern of the changes was almost the same with VSD surgery. In contrast, [Hb] was indicated to be below 0 mumol.L^{-1} during and after CPB. This was a different pattern from VSD surgery, in which the values remained above 0 mumol.L^{-1}.

CONCLUSION. The pattern of changes in [HbO_2] was uniform in both VSD and TOF patients, which findings supported that the changes in [HbO_2] could be effective for monitoring of congenital heart surgery. Low [Hb] may be related to remarkable improvement of arterial oxygenation during and after CPB in TOF patients.

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SIGNIFICANCE OF LOW VOLTAGE ELECTROCARDIOGRAM IN CORONARY ARTERY DISEASE

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INTRODUCTION. Clinical experience suggests that patients of acute myocardial infarction with low voltage electrocardiogram (ECG) have poorer prognosis as compared with those having normal voltage ECG. We attempted to determine the clinical significance of low voltage ECG amongst patients with coronary artery disease and to correlate left ventricular ejection fraction (LVEF)as estimated by 2-D echocardiography with low voltage ECG

METHODS. This was a cross sectional analytical study.100 consecutive cases of established coronary artery disease were studied. Exclusion criteria included cases of acute myocardial infarction (as 'stunning effect') in acute myocardial infarction may contribute to more reduction of LVEF), Pericardial effusion, Myxoedema, Chronic obstructive airway diseases, Obesity (as all of them may be associated with low voltage ECG), Valvular heart disease, Presence of bundle branch block or left ventricular hypertrophy and Dilated cardiomyopathy. Low voltage ECG was defined as <0.5 mV in standard leads and/or < 1 mV in precordial leads.

RESULTS. 60 out of 100 selected cases had low voltage ECG.There was no significant difference in the mean age,sex distribution and the frequency of site of infarction in those with low voltage ECG as compared with those having normal voltage ECG.36(60%) cases with low voltage ECG had heart failure (NYHA class II to IV) as compared with only 9(22.5%)cases with normal voltage ECG (p =0.0002) The mean LVEF as estimated by 2-D echocardiography was significantly lower in cases of low voltage ECG as compared with normal voltage ECG. (40% sd 11.2 vs 52% sd 12.4 ,p = 0.00001).53(88.35%) cases from low voltage group had low ejection fraction (<55%)as compared with only 18(45%) cases in those with normal voltage(p=0.0001).There was high sensitivity (88.33%) but low specificity (55%)and an over all accuracy of 75% of low voltage on ECG for perediction of poor LVEF on 2-D echocardiography

CONCLUSION. Since low voltage amplitude on ECG had sensitivity for prediction of poor left ventricular function as determined by 2-D echocardiography, it can be considered as a simple, inexpensive and readily available marker of poor left ventricular function. Further study would be required to evaluate it as an indicator of mortality in critical care setting

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USE OF INTRAORTIC BALLOON PUMP FOR VENTRICULAR FAILURE SUPPORT IN SEPTIC SHOCK

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INTRODUCTION. Myocardial injury and ventricular failure developed during septic shock have been associated with increased mortality in critically ill patients. Although myocardial enzymes elevation, eletrocardiogram and echocardiogram (ECO) suggestive of occlusive coronary artery disease (CAD) are often observed, the coronary angiography (CA) is usually normal and the treatment only supportive. We describe a case-series of intraortic balloon pump (IABP) for ventricular failure support in septic shock and literature review

METHODS. Retrospective analysis in a tertiary hospital ICU,from january 2001 to September 2002, of patients admitted with septic shock and severe ventricular dysfunction pattern on hemodynamic (SwanGanz) and ECO monitorization, receiving high dose norepinephrine and dobutamine were submitted to CA when possible and supported by IABP (Datascope®). Demographic data ,APACHEII, troponin I elevations,the number of organ failures, admission-diagnosis (surgical or clinical) and death in ICU were recorded. The literature review in PUBMED (key words sepsis, IABP, counterpulsation) evidenced few studies, mainly case-reports

RESULTS. Eight patients were enrolled but only 6(3 male) analysed-2 had received IABP out of ICU. The mean age was 67 years(47-85) and in 4 cases admission was due to clinical reasons. High troponin I levels were present in 83% (5/6).CA was performed in 3 patients and only one showed significant CAD.The mortality rate was 66% (4/6). Discharged patients were younger (52.5 vs 76.5 years) and less severe than those who died-mean APACHEII (17 vs 21.5) and nunmber of organ failures(3.5 vs 5.0)

CONCLUSION. IABP can support patients with myocardial injury and severe ventricular dysfunction in septic shock.We found that younger and less severe patients are benefited. There is little data in medical literature on this issue

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MYOCARDIAL CELL INJURY IN SEPTIC SHOCK

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INTRODUCTION. : To determine the presence of otherwise undetected myocardial cell injury in patients with septic shock using daily measurements eletrocardiographics, and bidimensional echocardiography, serum troponin I (cTN I) and serum C-reactive protein (when electrocardiographic evidence of acute myocardial infarction).
Design: Prospective observational study. Setting: Intensive care unit (ICU) of a tertiary institution.

METHODS. Patients: Twenty eight consecutive patients with septic or septic shock.
Interventions: Daily collection of blood for the measurement of cTN I serum levels. Cineangiography when was necessary. Illness severity assessment and collection of demographic data.

RESULTS. Twenty eight patients were studied for a mean period in ICU of 17,2 days (range, 3 to 37 days). All ten patients who died in the intensive care unit had elevated levels of cTN I, mean 21,9 ng/mL (range, 2,9 to 94,1). Survivors tended to lower levels of cTN I than non-survivors in septic shock, mean 12,4 ng/mL (range 0,5 to 57,0). All five patients who had abnormal cineangiography had elevated levels of cTN I, mean 38,4 ng/mL (range, 5,4 to 94,1), while normal cineangiography had cTN I mean 9,1 ng/mL (range, 0,5 to 27,8). The difference between serum C-reactive protein and cTN I or mortality failed to reach statistical significance. No patient had electrocardiographic evidence of acute myocardial infarction, although, on admission, five patients had left bundle branch patterns, two patients had right bundle branch patterns and two had evidence of an atrial fibrillation. Seventeen cardiac catheterization were done and five were abnormal correlating to abnormalities of echocardiogram. Three patients used intraaortic balloon pumping in a period of time up to six days(mean 3 days).

CONCLUSION. Myocardial cell injury (cardiac dysfunction) appears to be common in patients with septic shock but do.not correlate with coronary artery disease. It seems to be an imbalance between oxygen delivery and consumption.

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VASCULAR REACTIVITY TO NOREPINEPHRINE PREDICTS MORTALITY IN SEPTIC PATIENTS

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INTRODUCTION. The cardiovascular system's failure to maintain adequate cellular perfusion & oxygen delivery is termed as shock. SIRS progression to septic shock is one of the greatest challenges in non-coronary ICU(1). Volume resuscitation & vasopressors(VP) remain the standard of care in septic shock. Norepinephrine(NE) has evolved as the VP & inotrope of choice, but doubts remain as to whether it precipitates hepatic & renal failure in patients already susceptible to such, by increasing end-organ hypoperfusion(2). This study seeks to answer questions pertaining to timing & dosing of NE, as well as to revisit issues of organ failure.

METHODS. Prospective study in academic hospitals surgical ICU from May '96 until June '00. Included were patients admitted in septic shock (criteria adapted from Bone & ACCP/SCCM Consensus Conference, 1992) requiring NE support. Patients with septic shock & persisting hypotension despite aggressive fluid resuscitation, were treated with a continuous NE infusion, initiated at 0.1mug/kg/min aiming for an MAP 65mmHg.

RESULTS. 68 patients were included, 45 survived(S) while 23 died(NS)(median 6 days). There was no difference in the NE requirements (0.4mug/kg/min) between the two groups in the first 48h, but thereafter the NE dose in S continuously decreased, while NS patients could not regain their pre-septic haemodynamic state despite further increases in NE dose. Multivariate analysis indicated that SAPS II score at admission (OR 6.8), DAP <50mmHg (OR 24.9) or NE dose >0.5mug/kg/min (OR 17.7) at 60h of treatment were predictive of mortality (all p<0.05). Renal & liver function did not worsen under NE administration in S.

CONCLUSION. We suggest that all septic shock patients benefit from NE treatment. If a minimal DAP of 65mmHg or even the pre-septic shock DAP values are regained within 60h, with less than 0.5mug/kg/min NE at that time, the survival prognosis is favourable.

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POWER-LAW RELATIONSHIP OF HEART RATE VARIABILITY IN WORSENING HEART FAILURE AND ITS AGE-DEPENDENCE

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INTRODUCTION. The slope of the power-law regression line (SPL), calculated from 24-hour heart rate variability (HRV), has recently been shown to be significantly steeper in patients after heart transplantation (-2.0) and post myocardial infarction (MI, -1.15) when compared to control values (-1.06), and to powerfully predict premature death in the elderly. We aimed to investigate 1) the slope of the SPL in patients admitted due to worsening of chronic heart failure (CHF) and 2) whether there is an age-relationship of the SPL as previously published in healthy subjects.

METHODS. We studied 63 patients (age 62.6±11.5 years, NYHA 2.6±0.8; LVEF 27±8%; all mean±SD; 37% female; 63% with ischaemic aetiology; 58% on betablockers; 68% on ACE-I, 44% on statins) who were in stable sinus rhythm and had 24-hour ECG-recordings during hospitalisation. The power spectra of the RR-intervals were computed using a fast Fourier algorithm. A regression analysis of log(power)/log(frequency), based on the linear portion of HRV between 0.01 and 0.0001 Hz, was performed together with traditional indices of HRV (data not shown).

RESULTS. The SPL for the entire cohort of CHF patients was steeper than reference values in healthy subjects (-1.3±0.2 vs. -1.06±0.1, p<0.0001) and patients post MI (-1.3±0.2 vs. -1.15±0.2, p<0.0001). We did not find a difference comparing the SPL in middle-aged patients (40 to 60 years, n=21) and older subjects (>60 years, n=40): -1.2±0.2 vs. -1.3±0.2, p=0.3. Interestingly, there was no difference in the SPL according to NYHA class I-IV (-1.2±0.2, -1.3±0.2, -1.3±0.3, -1.2±0.3, p=0.4, ANOVA), reflecting depressed autonomic control independent of the clinical severity of the syndrome.

CONCLUSION. CHF patients, who were admitted for worsening of heart failure, seem to reflect an impaired intrinsic regulation of physiological processes and interorgan communication that is more pronounced than in MI patients. The depression of the autonomic function (AF) was independent of age and CHF severity. Our results support the concept of CHF as a form of a multiorgan dysfunction syndrome with severely depressed AF independently of traditional risk markers.
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ACUTELY OBSTRUCTIVE PROSTHETIC VALVE THROMBOSIS: ROLE OF THROMBOLYTIC THERAPY

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INTRODUCTION. Thrombotic occlusion of a prosthetic valve is an uncommon but serious complication. Intravenous thrombolytic therapy (TT) has been proposed as alternative to surgical treatment in critically ill patients (pts). Our aim was to evaluate the efficacy and safety of TT in pts with obstructive prosthetic valve thrombosis (PVT).

METHODS. We studied 15 pts (11 F, 4 M; 17-44 yrs,mean 28 yrs) presenting with 17 episodes (epi) of PVT (15 in mitral, 3 in aortic position). Pts had prosthetic valve replacement 2 weeks to 10 years (mean= 34.5 months) prior to admission. They presented with shock (n=4), pulmonary edema (n=10) or both together (n=3).Following clinical evaluation, PVT was diagnosed by tranthoracic &/or trans-esophageal echocardiography (TEE). Obstructive PVT was defined as restricted leaflet motion with increased valvular gradient (Gr), even if thrombus was not seen by TEE. TT was initiated in 13 epi(76%) (streptokinase in 11, tPA in 2) by standard protocols. Surgery was performed in 2 pts and i.v. heparin was used in 4 pts. Results evaluation was clinically, by echocardiography (TTE&TEE) with assessment of the trans-valvular Gr. Successful TT means reducing the Gr to normal for valve prosthesis, improved hemodynamics & pulmonary congestion with TEE showing dissolved thrombi. Partial success means partial reduction of mean Gr, clinical improvement with detected mobile thrombi by TEE.

RESULTS. Anticoagulation was inadequate in either non compliant pts (65% of epi), pregnant females shifting to SC heparin (24% of epi) or due to difficult control as seen in 1 pt (2 epi=11%). Compared to pts treated with heparin infusion (4pts) with 100% mortality, TT achieved 100% success rate (13/13 epi) with complete success in 11 (85%) & partial success in 2 (15%) epi. Complications of TT included 2 non obstructive peripheral embolizations (15%) treated conservatively. Recurrence was in 2 epi(12%) with successful rethrombolysis. Pregnant females (n=3) treated with TT showed complete success without complication & delivered normal children at 9 months' gestation.

CONCLUSION. Compared to heparin treatment, TT proved to be superior in dissolution of PVT. It has shown efficacy and considerable safety in acutely obstructive PVT in critically ill pts, with contraindication to surgery even in recurrent attacks & pregnant females. Females are more prone to PVT possibly due to socio-cultural factors, non compliance and pregnancy.

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PULMONARY EMBOLISM: PROGNOSTIC FACTORS FOR IN-HOSPITAL MORTALITY

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INTRODUCTION. Pulmonary embolism (PE) is under-diagnosed and presents high mortality rates. Therefore, mortality risk stratification is critical to guide the strategy for treatment.

METHODS. To evaluate the association between clinical and laboratory parameters with overall mortality in patients with PE.

METHODS. A multicenter longitudinal cohort involved 497 patients (58.6 female; age 69±15 years) admitted to tertiary hospitals in Brazil between January 1998 and February 2002 with the diagnosis of PE confirmed by the following criteria, considering the most reliable: pulmonary angiography, helical computer tomography, magnetic resonance or echocardiography, lung scan, venous duplex-scan with thrombus and clinical manifestation of PE. Clinical parameters included risk factors for venous thromboembolism and signs/symptoms of PE and additional exams encompassed ECG, chest X ray, creatinophosphokinase MB fraction (CKMB) and troponin I (TnI), arterial gasometry, and echocardiography (ECHO). Data were submitted to univariate and logistic multivariate analysis considering intra-hospital overall mortality as the dependent variable. P<0.05 was considered statistically significant.

RESULTS. The following variables were associated with increased mortality in the univariate analysis: age, history of neoplasia, bedrest >72h, chronic obstructive pulmonary disease (COPD), stroke, sinus tachycardia, tachypnoea, fever, arterial hypotension, cianosis, abnormal chest X ray, elevated CKMB, elevated CKMB and/or TnI, right ventricle dysfunction on the ECHO, and arterial pO2 <60 mmHg. The multivariate model identified the following variables associated with increased risk for mortality

CONCLUSION. In patients diagnosed with pulmonary embolism, clinical (age, bed rest >72h, COPD, congestive heart failure, sinus tachycardia, hypotension), and laboratory variables (T-wave inversion on the ECG and right ventricle dysfunction on the ECHO) are independent predictors of in-hospital overall mortality.
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PULMONARY EMBOLISM IN PATIENTS WITH DEEP VENOUS THROMBOSIS: DIAGNOSTIC ALGORITHM.

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INTRODUCTION. Diagnosis of pulmonary embolism (PE) is based on non invasive echocardiography (TTE) & ventilation perfusion lung scan) (V/Q) giving probabilities.Pulmonary angiography (PA) is the golden standard for definitive diagnosis. Our aim was to evaluate the predictive value of those tools in detection of PE in patients (pts) with deep venous thrombosis (DVT) compared to the standard PA.

METHODS. 20 DVT pts were included. Pts were subjected to clinical assessment, lab tests, ECG, blood gases, TTE, V/Q & PA. TTE is +ve for PE with signs of right ventricular (RV)overload & paradoxical septum in absence of cardiopulmonary disease.

RESULTS. PA revealed PE in 6 pts (gpI). GpII (14pts) showed normal PA. Compared to pts of gp II, gpI exhibited lower blood pressure (BP) (112+15vs128+24 in gpII,p=0.04),& lower PaO2 (64+12 vs86+19 in gpII,P<0.002). Clinically, PH with RV dilatation was seen in 4pts (66%) of gpI vs none (0%) of gpII (P<0.05) No significant differences were detected in both gps in lab tests, PH, HCO3, PaCO2,nor ECG. V/Q was +ve in 6 out of 6 pts of GpI(100%). Echo criteria of PE were shown in 4 out of the latter 6 pts (67%), while TTE was normal in all 14 pts of GpII(100%) (vs 57% of gpII detected positive by V/Q). TTE showed higher diagnostic accuracy (80% vs. 60% for V/Q) in diagnosis of PE in pts with DVT.

Predictive value of non invasive tools in diagnosis of PE in DVT pts

20 DVT Pts	PE-GP I (6pts)	GP II (14pts)	SP	SENS	PPV	NPV
V/Q +ve	6/6 (100%)	8/14 (57%)	43%	100%	43%	100%
TTE +ve	4/6(67%)	0/14 (0%)	100%	67%	100%	87%

CONCLUSION. Compared to V/Q scan, TTE is a bedside, non invasive, cost- effective tool, with excellent PPV & good NPV in diagnosis of PE. Our data suggest that DVT pts should be subjected to the following algorithm:Routine TTE to detect pts with RV overload indicating PE. Pts with -ve results are subjected to V/Q scan excluding PE with excellent NPV, while those with probabilities of PE are subjected to PA for diagnosis, specially in the presence of symptoms and hypoxia.

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MARKERS OF MYOCARDIAL INJURY TO PREDICT IN-HOSPITAL MORTALITY IN PATIENTS WITH PULMONARY EMBOLISM

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INTRODUCTION. Increased levels of creatinophosphokinase MB fraction (CKMB) or troponin I (TnI) may represent right ventricular myocardial injury in patients with pulmonary embolism (PE). Therefore, these laboratory changes may indicate right ventricular dysfunction and be associated with poor prognosis in PE.

METHODS. To determine the prevalence of elevated CKMB and TnI in PE and to investigate its potential association with in-hospital mortality. A multicenter longitudinal cohort involving 497 patients (58.6 female; age 69±15 years) admitted to tertiary hospitals in Brazil with the diagnosis of PE was conducted between January 1998 and February 2002. PE was confirmed by the following criteria, considering the most reliable: 1) visualization of thrombus in pulmonary artery by pulmonary angiography (ANGIO), helical computer tomography (CT), magnetic resonance (MR) or echocardiography (ECHO); 2) high probability lung scan (V/Q); 3) venous duplex-scan (VDS) with thrombus and clinical manifestation of PE. Blood samples for CKMB and TnI determination were drawn in the first 24h from hospital admission and considered the respective cutpoints of normality of each laboratory.

RESULTS. CKMB and TnI were measured in 322 (64.8%) and 289 (58.1%) patients, respectively. The proportion of positive results for CKMB was higher in non-survivors (28.6%) as compared to those patients surviving in-hospital period (9.4%; relative risk 2.7; P<0.0001). This proportion was not different for positive TnI results (survivors 13.1%; non-survivors 15.6%; relative risk 1.2; P=0.405), but was again significantly different when the positive results from CKMB and/or TnI were considered (survivors 19.3%; non-survivors 37.3%; relative risk 1.9; P=0.006).

CONCLUSION. Markers of myocardial injury, particularly elevated CKMB, are associated with intra-hospital overall mortality in patients with PE.
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PRESENTATION, CAUSES AND SHORT TERM PROGNOSIS OF PATIENTS WITH ACUTE HEART FAILURE

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INTRODUCTION. Acute heart failure (AHF) is a common but an ill defined clinical entity. A reassessment of the problem in view of new diagnostic and therapeutic options is required.
The first aim of our study was to evaluate clinical presentation, causes, hospital-course and short-term mortality of patients presenting with AHF. Second, subgroups of patients with decompensated chronic heart failure (CHF) and patients with de-novo (first manifestation of) AHF were compared.

METHODS. We performed a single center, prospective observational study. Hospitalized patients were included when they had significant symptoms and signs of venous congestion (dyspnea NYHA III or IV, orthopnea, rales, elevated venous pressure) or cardiogenic schock (low systolic blood pressure with signs of end organ hypoperfusion). Time interval between onset or worsening of symptoms and hospital admission had to be less than 7 days. Results are expressed as percentage or as medians.

RESULTS. 100 consecutive patients with AHF were analyzed. 11 presented with cardiogenic schock, 15 with pulmonary edema and the remaining had severe symptoms and signs of congestive heart failure. Time interval between onset of symptoms and hospital admission was shorter than 72 hours in two third of the patients. 69 patients had decompensation of CHF, the other 31 patients had new (de-novo) AHF. The reasons for AHF varied between these subgroups. Patients with de-novo AHF had a shorter ICU- (4 vs 9 days) and a shorter hospital–stay (10 vs 16 days). But they had to be treated more frequently in the ICU (45 vs 23%) and their in-hospital mortality was 16% compared to 9% of those with decompensated CHF.

CONCLUSION. For further studies we propose the following diagnostic criteria for AHF: - significant symptoms and signs of venous congestion or cardiogenic schock - new onset or worsening of these symptoms and signs within 7 days - exclusion of non-cardiac causes. Because decompensation of CHF and de-novo heart failure are different forms of AHF they should be distinguished in future therapeutic trials.

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PACEMAKER LEAD INFECTIVE ENDOCARDITIS: IS IT RELATED ONLY TO POCKET INFECTION?

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INTRODUCTION. Endocarditis related to pacemaker (PM)-lead infection is a rare but serious complication of permanent pacemaker.

METHODS. We reviewed our experience with PM lead endocarditis (IE) to determine its incidence, relation to pocket infection (PI) with its management, clinical picture & measures to avoid it.

RESULTS. Retrospective study over 4 years showed that 625 PPM were implanted in 554 patients (pts). 23 pts presented with PI (3.6% of implantations). All 23 pts were subjected to wound culture and sensitivity (C/S) with proper antibiotic treatment (TTT). Five pts (0.9% of pts) presented with lead IE. 4 out of the 5 pts had >1 PPM re-implantations (1-3 times)(vs 1 pt with no re-implantation). Two out of the 5 pts (40%) had previous PI. The other 3 pts had a history of either drug addiction (1pt) or frequent IV drug administration (2pts). Time lag between the onset of fever to diagnosis varied between 3-5 weeks. 3 out of the 4 pts with re-implantations (75%) had the same chronically implanted old lead due to failure of its removal in the last re-implantation session (75% vs. 19% (4pts) in PI group, P=0.05). They were as well subjected to re-implantation of the new system in the same session of explantation of the old PPM (75% vs 9.5% (2pts) in PI gp, P=0.04). Four out of the 5 pts (80%) presented with fever & shortness of breath (vs1pt with fever only), significant pulmonary hypertension (vs1pt with normal PAPs), large vegetations (>15 mm) documented by both TTE and TEE (vs 1pt with small one <4 mm). Three pts were subjected to surgical removal of the whole system (vs medical TTT in 2pts) with mortality in 1 pt (20%mortalilty).

CONCLUSION. PM lead IE is a rare but serious complication. In only 40% of cases, it is proved to be due to previous PI. To avoid PPM lead IE, we recommend: 1-Removal of the whole system including the PPM & lead in management of PI. 2-New system reimplantation on the other side is postponed for at least 1 week post explantation of the old infected system with proper TTT according to the C/S. 3) Prolonged fever in a pt with PPM should raise the suspicion of IE with proper management. 4-In absence of PI, should we consider pts with PPM candidate for IE prophylaxis, same as those with valvular prosthesis?

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ADHERENCE TO A MASSIVE TRANSFUSION PROTOCOL DOES NOT PREVENT SEVERE HAEMOSTATIC DERANGEMENTS

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INTRODUCTION. Massive transfusion protocols have been designed to guide the selection and timing of blood products in massively bleeding patients (1). Therapeutic goals during massive transfusion are: Hb 60-100 g/L, aPTT-ratio and INR < 1.5, fibrinogen >1 g/L and platelet count >50-100 x 10 * 9 /L (1). As prophylactic transfusion of blood products is not recommended, close monitoring of haemostasis is essential. This study evaluated the efficacy of an existing massive transfusion protocol to maintain safe levels of haemoglobin, serum electrolytes and haemostatic properties.

METHODS. In a retrospective study patients who had massive blood transfusion during their ITU-stay were evaluated with regards to: selection and timing of blood products, laboratory data and outcome.

RESULTS. 48 patients were included. Reasons for blood transfusion were GI-bleed, multitrauma , elective and emergency surgery, peripartum haemorrhage (PPH), and postoperative bleeding. Overall mortality was 33%. Mortality of patients with preexisting haemostatic disordes (medication or liver impairment) was 65% (9/14). Mortality was high in patients with GI-bleeds or emergency surgery (7/12 and 6/10). No patient with PPH or multitrauma died.

Parameter	**Mean ± SD**	**Parameter**	**Number of patients**
PRC (units)	17.8 ± 13.9	Hb < 60g/L	9/48
FFP (ml/kg)	20.8 ± 15.4	INR or aPTT > 1.5	38/48
Plts (units) (n=24)	2.1 ± 1.2	PLT < 100000	40/48
Cryo (units) (n=9)	14.8 ± 7.4	Criteria for MVB	38/48

MVB=INR or aPTT >1.8 or Fib <0,5 or PLT < 50000

CONCLUSION. Transfusion practice followed current recommendations (1). Haemoglobin and electrolytes were mostly within safe limits. Coagulopathy and thrombocytopaenia occured frequently. Nearly 80% of patients fulfilled the criteria for microvascular bleeding. Current recommendations for laboratory monitoring during massive transfusion may need to be reviewed.

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AUDIT OF BLOOD TRANSFUSION IN A PAEDIATRIC INTENSIVE CARE UNIT

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INTRODUCTION. To monitor our own indications for transfusion and volumes of blood used. Indications for transfusion vary between different groups of paediatric patients.

METHODS. We monitored all blood transfusions done in our unit over a three month period. Forms were completed by the medical and/or nursing team looking after the patient for each transfusion.

RESULTS. 52 transfusions were audited, (9 neonatal [17.3%]).Of the patients: -33 were postoperative cardiac patients (63.46%) -9 were postoperative general surgical patients (17.3%) -8 were medical patients (15.38%) and -2 were acute trauma patients (3.84%). The range of haemoglobin values before transfusion: 4 g/l - 12.6 g/l, (mean value for haemoglobin was 8.5 g/l). 6 patients did not receive the prescribed amount of blood (11.53%). Of those six, 2 patients had to be transfused again and had exposure to blood from a different donor (33.3%). 8 patients received more than one transfusion due to ongoing losses associated with their pathology (15.38%).

CONCLUSION. During the 3 month period of the audit, it became clear that professionals use different transfusion triggers, (range 4 g/l-12.6 g/l). In paediatric populations, with different age groups, it may be difficult if not impossible to define a single value. In any case, our mean value for transfusion is 8.5 g/l. The calculation of volumes to be transfused is done mainly following haemoglobin based formulas, which vary depending on whether whole blood or packed cells are transfused, or volume based formulas, (10-20 ml/Kg). This is a factor that can contribute to confusion in the amount of blood required. It is also subject to operator differences indicating the transfusion. The range of volumes of blood prescribed for transfusion varied between 40 ml and 450 ml. 6 patients did not receive the prescribed amount of blood (11.53%); this resulted in 2 of them being exposed to more than one donor (33.3%). Clear guidelines need to be followed by professionals working in the PICU setting. Blood conservation in a population exposed to multiple invasive procedures and repeated sampling, must be a priority.

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ESOMEPRAZOLE 40MG PROVIDES EFFECTIVE ACID CONTROL WHEN GIVEN ORALLY OR AS 30-MIN IV INFUSION

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INTRODUCTION. Esomeprazole taken orally has shown improved acid control *vs* all other PPIs and demonstrated more effective healing rates in erosive oesophagitis *vs* omeprazole and lansoprazole. An intravenous formulation of esomeprazole would be expected to provide this same improved acid control when oral intake is not possible or is impractical. This study compared the effect on intragastric pH of esomeprazole 40 mg given intravenously as a 30-minute intravenous infusion and as oral administration during repeated once daily oral dosing in healthy subjects.

METHODS. In a double-blind randomised, two-way cross-over study, 39 healthy volunteers (25 males; mean age: 26 years; mean weight:72 kg) received esomeprazole 40 mg once daily before breakfast either as a 30-minute intravenous infusion or oral administration for 5 days with a washout period of at least 13 days between treatments. Continuous 24-hr intragastric pH was recorded during standardised conditions at baseline and on days 1 and 5 in each period. The percentage of time with intragastric pH>4 during the 24-hr period following dosing on days 1 and 5 were analysed separately, using a mixed model ANOVA. The mean for each treatment and the mean treatment difference were estimated with 95% confidence intervals (CI).

RESULTS. See table below. Esomeprazole 40 mg given intravenously as a 30-minute intravenous infusion or orally was equally well tolerated.

Percentage of time with intragastric pH>4

	Infusion	**Oral**	**Infusion-Oral**
Day 1	42.1 (35.2-49.1)	36.5 (29.6-43.5)	5.6 (1.2-10.0)
Day 5	66.2 (62.4-70.0)	63.6 (59.7-67.4)	2.6 (-0.5-5.8)

Results presented as mean (95%CI)

CONCLUSION. Single dose IV administration of esomeprazole 40 mg resulted in a small difference in acid control in favour of IV, but by day 5, there was an equivalent percentage of time with intragastric pH>4 during the 24-hour period compared with oral administration, thus providing the same effective acid control.

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CHANGES IN THE PROFILE OF INTERHOSPITAL TRANSFERS FROM A GENERAL HOSPITAL IN THE NORTH GREECE.

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INTRODUCTION. The 250 beds Bodosakio Hospital of Ptolemaida aims at providing specialized services to the people of the wider region of Western Macedonia so that care can remain at the local level for the lowest cost and the best patient outcome. The objectives of our study were to compare frequency and other characteristiques of external road transfers during a period of organizational change concerning 1.) Local policies allowing transfers exclusively between hospitals part of the National Health System and imposing an accompanying physician and 2.) The establishment of a 4 functioning beds intensive care unit in Bodosakio Hospital.

METHODS. Hospital forms registering interhospital transports for a period of two years (April 2001-April 2003) were analyzed. Extracted data concerned the total number of transfers, the primary diagnosis and the reason for transport, the transferring department and the accepting hospital, the transfer categories (I. Intensive, II. Time critical, III. Ill and unstable, IV. Ill and stable, V. Unwell, VI. Well) and the accompanying personnel.

RESULTS. The greatest absolute decreases in transfer frequency were those for medical diagnosis. The number of head injury, intracranial bleeds and aortic aneurysms cases were relatively fixed. Main changes are shown in the Table.

	2001	2002	Absolute change
Total tranports/to a tertiary centre	239/200	124/111	-115/-89
Medical reason for transport	132	62	-70
Trauma/ Severe head injury	15/14	11/9	-4/-5
ICU transfers/ICU admissions	-	22/152	-
Cat.I, II, III/ VI, V, VI	72/167	25/99	-47/-68
ICU-trained/junior doctor	1,67%/69.45%	12,9%/83.06%	+11.23/+13.61%

CONCLUSION. Over this 2 years period a decreased use of ambulances reflects the developement of local policies. ICU admissions accounted for a large proportion of the difference in categories I, II, III. This data seem to support the availability of specialty trained intensivists to smaller hospitals. The fixed number of transfers to a neurosurgeon and to a vascular surgeon supports the need for the establishment of a trauma center.

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PERCU TWIST TRACHEOSTOMY: FIRST EXPERIENXE IN A NEUROSURGICAL I.C.U.

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INTRODUCTION. Tracheostomy is a current tool in I.C.U.Recentely a new percutaneous technique Percu Twist(PT)has been proposed to allow single step dilation,reducing bleeding and problems(1)

METHODS. The(PT)was introduced in our neuro I.C.U.15 months ago. Criteria for PT were:intubation lasting over 16days,cranial nerves impairment,severe facial and spinal trauma,need for prolonged MV.The PT was made under general anesthesia with propofol 5-6 mg/Kg/h,fentanyl 0,2-0,3mg,vencuronium 0,08mg/Kg.During the procedure peak airway pressure(Paw),SpO2,ABP and HR were recorded.Due to the elapsed time from admission only few pts still had intracranial pressure (ICP) monitored.The internal diameter of the cannula (I.D.)was selected according to the patient size; we used the n.8 I.D. in the patient >50Kg.A follow up made on the laringoscopy data was also collected when available.

RESULTS. From January 02 to March 03 we performed 26 PT tracheostomies. Data are listed below: 11F/15M, age 51.1±16.1,23 surgical+3medical; ID8mm (20pts), ID7mm (6), time 48.7min±20.3, SpO2 97.7%±2.9, EtcO2 44mmhg±9.1, ABP130 mmHg±26.8, HR 69±16.4. Adverse events related to the technique were: 3guide malpositioning, 1 to the sliding of the stylet. In 4pts erroneous approaches were made: 2 by lateral and 2 by submucous way. Only in one pt with submucous approach we reported a transient desaturation at 87%. In 2 pts ICP value was <23mmHg, in the 3rd the ventricular drainage was kept open. Followup by laringoscopy was performed in 8 pts (30.7%): 6 were scored as normal, while 2 showed transient damage (oedema, erosion) with a good recovery at a second control. In the 3 pts with ICP, the highest value was less than 23.

CONCLUSION. In our experience the PT was a useful method of tracheostomy. 1) The easy way of this approach allowed us to share the methodology within the team. Technical problem were of minor importance:the only adverse event was a transient desaturation. 2) The length of the manoeuvre correlates with the different experience of the operators and is likely to decrease in time. 3) Cardiovascular and respiratory values were consistent with a good stability that is of paramount importance in neurologic patients, avoiding vasodilation, desturation, and adrenergic reactions. 4) Few data were collected concerning the laringoscopy:however the result are quite encouraging and underline the safety of the procedure.Further increasing in our experience will underline these first positive results.

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PLASMA NUCLEIC ACIDS ESTIMATION – PROMISING APPROACHE

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INTRODUCTION. Circulating nucleic acids in plasma are useful markers in cancer and autoimmune patients. The PicoGreen stain intercalates into double stranded DNA or RNA. When UV-illuminated, it elicits a fluorescence light. We try to develop an extremely simple and effective method for the PicoGreen positive material in plasma visualisation and its use for intensive care patients' prognosis.

METHODS. 2 ml of peripheral blood is mixed with 20 mu 0.5M EDTA, centrifuged and 100 mul of upper plasma used for tests. 7 mul of plasma was treated with 2 mul of protein lysis buffer (Proteinase K, 20 mg/ml; 1% sodium dodecylsulphate) at 10 min/55°C, mixed with 2 mul of PicoGreen stain (dilution 1+10 000), loaded to the 2% agarose gel and electrophoresed 150V/15 min. High and low molecular weight bands were recorded by band positions, their shape and quantity were evaluated by densitometry. The method was tested in 1:20 scale when 100 mul of blood was aspired by pricking and 7 mul of plasma used directly for analyses. Three consecutive plasma samples from 40 intensive care patients and 12 controls were aspirated and analysed (day 1, 3 and 6).

RESULTS. The chemical nature of the PicoGreen positive stains remains unclear since they are both DNAse I and RNAse A resistant (10% intensity decrease in both) and weakly prone to Proteinase K treatment (25% decrease). Sodium dodecylsulphate does not reduce the signal intensity but shift the electrophoresis position of the main band from the approximately 300 bp to 140 bp. There is a large variability in low/high molecular weight band positions, intensities, and peak shapes. Intensive care patients tend to have higher absolute amounts of plasma nucleic acids level (PNAL) than controls at day 1. The regional differences in samples taken from jugular bulb, radial artery and vena cava superior in polytrauma patients with craniocerebral injury were also identified.

CONCLUSION. We have established the reproducible and simple method for extraction of promising parameters from peripheral blood. Because of low material consumption it may be performed even several times a day. The method produces time-dependent data changes; their exploitation for intensive care patients must be evaluated in a further study.
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INFLUENCE OF THE INCREASE OF POSITIVE END EXPIRATORY PRESSURE (PEEP) ON THE INTRA-ABDOMINAL PRESSURE

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INTRODUCTION. The intra-abdominal pressure (IAP) usually elevates on critically ill patients and must be monitored to avoid compartmental syndrome. The mechanical ventilation may increase the IAP even more by the transmission of the thoraxic pressure from the diaphragm. Objective: Assess the effect of the optimization of the PEEP on the increase of the IAP on patients with diagnosis of hypertension intra-abdominal

METHODS. 15 patients needing PEEP optimization and intra-abdominal hypertension; the measurement of the IAP was obtained by intravesical pressure on 5 different moments: before and after neuromuscular blockade, right after PEEP optimization, 6 and 12 hours after this procedure.

RESULTS. 15 patients, 33,3%(5) female and 66,7%(10) male; ages between in 20 e 89 years old; mode 61 years. 7(46,7%) patients underwent gastroenterological surgeries, 5(33,3%) trauma victims and 3(20%) aorta surgeries. Considering the Burch classification, 10 patients had intra-abdominal hypertension grade I (10,4-15mmhg), 4 patients grade II (16-25mmhg) and 1 patient grade III (27,5mmHg). The initial IAP measurement and the 4 measurements after PEEP optimization were between 2-10mmHg; the diferences among them were not significant (tests realized of Friedman Analisis with p=0,196, therefore > 0,005).

CONCLUSION. The increment of the PEEP does not alter the levels of intra-abdominal pressure in the first twelve o'clock hours after PEEP optimization.

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PROSPECTIVE EVALUATION OF ULTRASONOGRAPHIC EXAMINATION FOR DIAGNOSIS OF INTRAPERITONEAL FREE AIR

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INTRODUCTION. We can make a diagnosis of gastrointestinal perforation by detecting intraperitoneal free air (IPFA). IPFA is usually detected by plane Xray examination or CT scan. Recently, some authors reported that IPFA was detected by ultrasonography (US). In patients with severe shock or severe trauma, we preferred US to CT because US can be performed in supine position without movement of the patient. The object of this study is to clarify the usefulness of ultrasonography for the detection of IPFA in acute abdomen and abdominal trauma patient.

METHODS. Acording to our protocol, acute abdomen or abdominal blunt trauma patients were examined at first with portable plane x-ray and US (TOSHIBA, CAPASEE 2) at supine position in the emergency room. We made a ultrasonographic diagnosis of gastrointestinal perforation by detecting high echoic spot with high echoic shadow ventral of the quadrate lobe of the liver, which can easily move by compression. Air in the lung is easily differentiated from IPFA by detecting the layer of the high echoic line and relationship with respiration. Plane x-ray examination at supine position can hardly indicate IPFA. Conclusive diagnosis of gastrointestinal perforation was made by operative findings or clinical observation for more than 4 days. Patients without worsening of the general condition and abdominal irritation sign for 4 days were diagnosed as non-gastrointestinal-peforation.

RESULTS. IPFA was detected in all patients with gastrointestinal perforation, except in 2 patients whose IPFA was very little and only CT can indicated IPFA as small bubles in mesentery, not as a large buble on the liver surface. On the other hand, US can nigrect the existence of IPFA in 2 patients with blunt abdominal trauma, who were suspected to have IPFA on the liver surface by CT images. The sonographic sign of IPFA was not detected in other abdominal blunt trauma patients and acute abdomen patients without gastrointestinal perforation in whom IPFA was not detected by Xray examination or CT scan and who had no peritoneal irritation sign through their clinical courses.

CONCLUSION. US is useful for the diagnosis of gastrointestinal perforation in acute abdomen or blunt abdominal trauma patients. It is important to understand the merit and demerit of US for detection of IPFA.

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THE URINARY NAG / CREATININE RATIO AS A MARKER OF RENAL DYSFUNCTION AFTER MAJOR SURGERY AND TRAUMA.

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INTRODUCTION. Acute renal failure occurs in 5-15% of patients after major surgery and trauma, and is associated with increased mortality[1]. Elevations in biochemical markers occur late in this process, and are influenced by many non-renal factors. The N-acetyl-eta-D-glucosaminidase (NAG)/Creatinine ratio is a sensitive marker of tubular damage, and is easily measured in the urine[2].

METHODS. We studied 58 patients admitted to the general ICU within 12 hours of trauma or major surgery. No patient had a history of pre-insult renal dysfunction. We measured urinary NAG/Creatinine ratios on admission, and plasma creatinine throughout the 72-hour study period. Group 1 (n=43) maintained normal renal function. Group 2 (n=13) developed renal dysfunction, as defined as a plasma creatinine greater than 120 $mmolL^{-1}$. Patients in subgroup 2a had a normal plasma creatinine on admission, but developed dysfunction within 72 hours (n=7).

RESULTS. 97% of patients had NAG/Creatinine ratios above the normal range (11-23 mmol $mmol^{-1}$ creatinine), indicating tubular damage. The ratio was significantly higher in patients who developed an elevated plasma creatinine. Of all the patients who had a normal admission plasma creatinine, the ratio was significantly higher in those who went on to develop renal dysfunction by 72 hours.

Admission urinary NAG/Creatinine ratios (mmol mmol-1 creatinine)

	Group 1 (n=43)	Group 2 (n=13)	Subgroup 2a (n=7)
NAG / Creatinine	102 (110)	304* (304)	438* (360

*Between group comparisons for groups 1 and 2 =*p<0.01 ,groups 1 and 2a =*p<0.01*

CONCLUSION. The NAG/Creatinine ratio is an easily measured, sensitive marker of tubular damage. Early elevations in the ratio may highlight patients at risk of later renal problems.

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SHORT AND LONG TERM EFFICACY OF CPR IN A GENERAL, ADULT ICU

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INTRODUCTION. Successful Cardiopulmonary Resuscitation (CPR) rates in an ICU population range from 16.8 to 44% and long-term survival to hospital discharge from 3.1 to 16.5% (1,2 3,). The purpose of the study was to investigate initial CPR successful rate and long-term survival in an ICU population suffering a cardiac arrest.

METHODS. In this study we included all patients having cardiac arrest in a two years period in a general, adult ICU of a general hospital of Athens. We retrospectively collected clinical data from patients records kept in our hospital concerning patients, CPR characteristics and survival rates.

RESULTS. We examined 111 ICU patients, aged 56.4 ± 1.9 years (72 males). SAPS II score was 43.9 ± 3.8. CPR was performed in 98.2 % of the patients within 30 seconds of the event. Two patients had a DNR order. Initial restoration of cardiac function and thus successful CPR rate was 100% while 24 h survival was only 9.2%. These patients were younger, mainly males, with lower SAPS II score, having mainly pulmonary diseases, ventricular fibrillation or ventricular tachycardia (8/10) and initial pupil reactivity (5/10). Four patients required more than one CPR cycles. Survival to hospital discharge was zero.

CONCLUSION. Among ICU patients' initial successful CPR rate may be extraordinary high due to close monitoring and experienced personnel but long term survival and hospital discharge is disappointing. These results may be affected by our low percent of DNR policy (1.8%). Although ICU patients are better monitored and timely treated, they are disadvantaged by the chronic underlying diseases, severe current medical illnesses and multi organ dysfunction syndrome (MODS) leading to worst outcome after CPR compared to in-ward patients.

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PHYSIOLOGICAL DERANGEMENT PRIOR TO CARDIAC ARREST

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INTRODUCTION. Despite the best efforts of cardiac arrest teams the outcome from in-hospital cardiopulmonary arrest (CA) remains poor. Several studies have demonstrated that many of these patients exhibit markers of clinical deterioration prior to their arrest and may benefit from early intervention (1).

METHODS. We conducted a prospective, cohort, observational study of all in-hospital CA in a 900-bedded Scottish teaching hospital over a four-month period. Our aims were to determine whether there were abnormal physiological markers present in the 24 hours prior to CA. We used the criteria described by Hillman et al (2) with the addition of SpO2<90%.

RESULTS. Between May and Sept 2002 there were 70 cardiac arrests. We collected complete data for 90% of cases. (Mean age 68.2 yrs (range 18-91), 67% male.) Almost 70% of patients had abnormal physiological markers in the 24 hours prior to their arrest. The most common makers were systolic blood pressure <90mmHg, SpO2<90%, respiratory rate >36 and nursing staff concern. Overall, the immediate mortality from CA was 60%. The presence of one physiological marker was associated with a mortality of 40% increasing to 66% for 5 markers. It was surprising that the patients with no recorded physiological derangement had the poorest outcome with 76% mortality. Only 14% of these patients were in a monitored high-dependency facility. The presenting rhythm at CA in the majority (81%) of these patients was non-VF/VT, suggesting that physiological derangement may have been present but either not monitored or documented.

CONCLUSION. 1) 70% of patients displayed abnormal physiological variables in the 24 hours preceding cardiac arrest; 2) the greater the number of abnormal variables the worse the outcome; and 3) mortality from cardiac arrest was highest in the non-HDU areas where levels of observation and documentation are lower.

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THERAPEUTIC HYPOTHERMIA AFTER RESUSCITATION INDUCED WITH A COLD-WATER MATTRESS

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INTRODUCTION. Therapeutic hypothermia (TH) for 12 to 24 hours improves outcome in resuscitated patients from out of hospital cardiac arrest (OOHCA). These studies used surface cooling i.e. ice packs or forced air-cooling. In this way cooling rates vary between 0.9 C/hour and 0.3 C/hour. The aim of this study was to evaluate cooling process via nurse driven temperature regulation of central body temperature by adjusting the temperature of the cooling mattress. Endpoints were the hours till the target temperature (32-34 C) was reached and if the rate of cooling until target temperature (0.3-0.9 degrees /hour was reached).

METHODS. We used a temperature adjustable (1-40 degrees Celsius) water mattress (Gaymar; Medi-Therm) which is adjustable between 1-40 degrees Celsius, is familiar to the nursing staff since this tool is also used as part of the rewarming strategy in our unit to treat accidental hypothermia. All patients were mechanically ventilated and paralysed and sedated as needed to prevent shivering. Cooling was started directly after ICU admission.

RESULTS. In the period from January 2002 till March 2003 55 patients (83.6% males; mean age 61.7 SE (1.8)) were treated with TH after OOHCA. Thirty patients (54.5%) had ventricular fibrillation, 20 (36.4%) asystole, 5 (9.1%) EMD or an unknown rhythm as initial rhythm. ICU and hospital mortality was 36.4 resp. 60 percent. Of the 1945 possible hourly temperature measurements 97.2% were feasible for evaluation. No measurements were missing before the target temperature (TT) was reached. One of the patients did not reach the target range (TR) within less than 5 hours (table 1).

hours till	1	2	3	4	5
TR reached	24 (43.6)	36 (65.5)	46 (83.4)	52 (94.5)	54 (98.2)
Cooling rate till TT (range)	1.1 (0.4-2.6)	0.9 (0.2-0.7)			
Temperature <31.5 C (%)	2 (3.6)	2 (3.6)	2 (3.6)	6 (10.9)	6 (10.9)

CONCLUSION. The cooling process via nurse driven temperature regulation of central body temperature by adjusting the temperature of the cooling mattress is a simple and save method of applying therapeutic hypothermia.

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MYOCARDIAL AFFECTION INTHE COURSE OF POST TRAUMATIC SUB ARACHNOID HEAMORRAHGE : INTEREST OF TROPONIN

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INTRODUCTION. Incidence collect of coronary complications in post traumatic sub arachnoids haemorrhage (SAH). Interest of Troponin dosage (TnIc) to detect ECG changes in post traumatic SAH.

METHODS. Prospective and double blind study including 35 post traumatic SAH patients (15 months). Non inclusion criteria are neurological vascular coma, post traumatic coma without SAH, multitrauma or cardiovascular records. Patients selection and treatement were standardized in order to avoid systemic insults. Cerebral tomodensitometry is systematically practiced at 48H or emergency. Daily ECG with 12 standard diversions was practices during 5 first days. Samples of TnIc (D1, D2 and D5 after admission) are performed by sandwitchs immunoenzymatic assay by access automaton. Statistic analysis is performed by Chi2 tests and variance analysis for qualitative and quantitative variables respectively. Values are expressed in mean (SD) and analysed in the end of the study.

RESULTS. Mean age is 39 (17) ans. 60% of patients are aged less than 50 ans. Sex ratio is 4. Thirteen patients die. Thirty patients had serious head trauma, Six of them were operated in neurosurgery. 19 patients had Fishers score at 3-4. Among patients, 20 Showed ECG changes (rhythm and repolarisations disorders etc.) at any time during the first 5 days. 75% of anomaly had appeared the third day. At any time of this study, twelve patients had high TnIc (TnIc > 0.08 ng/ml). Demographic parameters, Injury severity score, APACHE II and initial GCS were comparable between High and Nornal TnIc groups. Patients having 3 and 4 Fishers score (83%) at admission had high level of TnIc. Among patients with Fischers score of 2, 87% had normal TnIc ($p = 0.01$). Only T-onde change is associated with significative increase of TnIc ($p = 0.002$). Among 12 patients having high level of TnIc, 8 died, whereas mortality were about 5 among 23 patients having normal level of TnIc. Relatif risk was 3.

CONCLUSION. Repolarisations disorders in the course of post traumatic SAH were frequent during the three first days. It can reflect myocardial affection as showed by Troponin Ic rising associated with hard neurological insults.
Grant acknowledgement: We thank the biochemistry laboratory of SA Institute for their collaboration to establish this study.

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HOSPITAL SURVIVAL AFTER IN-HOSPITAL RESUSCITATION IN PATIENTS ADMITTED TO GENERAL WARDS

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INTRODUCTION. Despite cardiopulmonary resuscitation (CPR) is a standard procedure in hospital settings and follows established guidelines reported success rates show a wide range. Different hospital settings make interhospital comparisons and benchmarking difficult. Despite this limitations we report on outcome of in-hospital CPR in a large number of patients to provide data to for further evaluation of intrahospital emergency medicine

METHODS. In an observational prospective study we evaluated outcomes of all patients resuscitated in our hospital between january 2000 and december 2002. Patients in whom cardiac arrest ocurred before hospital admission and patients already admitted to the ICU were excluded from the study. All resusciation efforts were performed by a resuscitation team staffed by intensive care team members only according to recently published guidelines. All other housestaff have been instructed in basic life support. Operation of the resusciation team was initiated by calling an emergency number from anywhere in the hospital

RESULTS. In the 3 years study period CPR was performed in 253 patients (98 women, 145 men). Mean age was 69,7±12.9. Mean duration for arrival of the resuscitation team at the scene was 4 minutes. Primary diagnosis was ventricular fibrillation/ tachycardie in 54, asystolie/bradycardie in 105, pulsless electrical activity in 28, and others (mainly acute respiratory failure) in 66 patients. CPR was successful in 161 patients (63.6%), 68 patients (26.9 %) survived to hospital discharge. Outcomes in relation to different arrest rhythms are displayed as follows: Arrest Rhythm: (1) VF/VT (2) Asystolie (3) PEA (4) Others - Survival (%) CPR: (1) 75.9 (2) 69.5 (3) 39.3 (4) 54.5; Survival (%) 24h: (1) 66.7 (2) 48.6 (3) 17.9 (4) 46.9; survival (%) hospital discharge: (1) 42.6 (2)21.9 (3)7.1 (4)30.3

CONCLUSION. In comparison to the literature we found a high rate of survival to discharge after in-hospital CPR. This may be explained in part by the impact of a very experienced resusciation team and by very short times required for arrival of the resuscitation team at the scene. A very high rate of CPR success in patients with asystolie suggests that in some of this patients respiratory problems and not asystolie was the primary event

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TRANSCRANIAL DOPPLER ULTRASONOGRAPHY POST CARDIAC ARREST

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INTRODUCTION. To evaluate cerebral flow in patients surviving cardiac arrest(CA) and to describe the progression of cerebral blood flow in those patients during the hours following cardiopulmonary resuscitation.

METHODS. Patients in the intensive care unit of our hospital during the year 2001 who were successfully resuscitated after CA. Serial Doppler ultrasonography: 6-12 hours post CA and then every 12 hours. Extracranial carotid arteries were recorded, as were bilateral middle cerebral arteries, and bilateral internal carotid arteries, high in the neck. Analysis of mean flow velocity, pulsatility index, and interhemispheric index.

RESULTS. 12 cases, 9 of them valid: 8 males, 1 female. Mean age: 65,77 years. Causes of the arrest: cardiac (4),respiratory (4), pancreatitis (1). 6 were exitus and 3 survived: 2 with minor or moderate sequelae and 1 without sequelae. 6 patients showed high mean flow velocity in middle cerebral artery with a pattern of hyperemia. In 3 of them early hyperemia was seen. Of these patients, 5 were exitus. The 3 remaining patients had low or normal mean velocity, with a normal flow pattern. Of these 3 patients, 2 survived without important sequelae.

CONCLUSION. Heterogeneity in cerebral blood flow post CA was probably dependent on clinical evolution.Predominance of moderately high mean flow velocity with a pattern of hyperemia was associated with a poor neurologic prognosis.

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REDUCING THE NUMBER OF IN-HOSPITAL CARDIAC ARRESTS

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INTRODUCTION. Although considerable resources have been poured into resuscitation training services, there has been only minimal improvement in outcome. Survival from in-hospital arrests in the United Kingdom is 17% overall[1] The incidence of cardiac arrests may be reduced by an emergency response team[2].The effect of introducing a patient emergency response team (PERT) on the incidence of cardiac arrests was audited.

METHODS. The PERT was introduced in November 2000. All ward staff were educated to call the PERT in response to abnormal commonly-used ward observations such as heart rate. An education programme in recognition and response to patient emergencies was also set up. Data was collected for January-December 2000 (pre-PERT)and January-December 2001 (post-PERT).The cardiac arrest incidence in an acute hospital which did not have PERT was also collected for the same periods for comparison. The incidence of cardiac arrests was taken from hospital switchboard log using the definition of Buist et al.[2]. Arrests occurring for out-patients, theatres and ICU were excluded.The number of patients admitted to the hospital was obtained from central patient data sources.

RESULTS. The number of cardiac arrest calls (Middlesex Hospital)decreased by 19% from 107 in 2000 to 87 in 2001. The number of cardiac arrest calls at UC Hospital was 197 in 2000 and 199 in 2001. The difference did not reach statistical significance due to the very small change in a large patient population

Incidence of Cardiac Arrests in The Middlesex and UC sites

Year	2000	2001
Middlesex Hospital	4.2/1000 pt adm.	3.7/1000 pt adm.
University College Hospital	13.6/1000 pt adm.	14.2/1000 pt adm.

CONCLUSION. The introduction of a PERT is associated with a 19% reduction in cardiac arrests.Further investigation is required to establish whether this is associated with improved outcome.

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PROGNOSTICS INDEX: EVALUATION OF SOFA AND MODS IN PATIENTS AFTER CARDIAC ARREST IN INTENSIVE CARE

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INTRODUCTION. The cardiac arrest is a frequent event that generates considerable exacerbation of the morbidity index of patients at the ICU.
Objective: Assess the variation of the index SOFA (Sequential Organ Failure Assessment) and MODS (Multiple Organ Dysfunction Score) as morbidity predictors after cardiac arrest.

METHODS. The indexes SOFA and MODS were calculated for 40 patients that suffered cardiac arrest at the ICU; the indexes were calculated based on laboratory values and clinical data obtained 24h before and after cardiac arrest.

RESULTS. 40 patients: 17(42,5%) female and 23(57,5%) male; the age varied from 17 to 84 years old, mode 76 years; the causes of cardiac arrest were shock and metabolic disorders in 18(45%), hypoxemia in 16(40%), myocardial ischaemia and poisoning by drugs in 6(15%); the modality of arrest was asystolia in 17(42,5%), pulseless electrical activity in 14(35%) and ventricular fibrillation in 9(22,5%). The APACHE II score varied from 2 to 47, mean of 21, mode 11, mean risk of mortality 32,54%. The previous SOFA score varied from 6 to 16, mode 8 and after arrest from 8 to 18, mode 14; the MODS score varied from 3 to 16, mode 7 and after arrest from 5 to 21, mode 12; in statistic analysis using the Wilcoxon test, the increase of the SOFA and MODS indexes after cardiac arrest was significant (zcala:5,33 or p< 0,001), but in a not parametric comparison between the two indexes, we noticed that the proportional increase of each one in the same patient occurred only in 21% of the patients.

CONCLUSION. The SOFA and MODS indexes separately demonstrated to be good predictors of major morbidity of patients after cardiac arrest, but they did not as correlate variables for the same situation.

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ONLINE ANALYSIS OF VENTRICULAR FIBRILLATION IN PATIENTS WITH ICDS

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INTRODUCTION. Animal studies and studies in human victims of cardiac arrest have suggested that the characteristics of VF waveforms may predict the outcome of a defibrillation attempt. In all these studies, the time interval from cardiac arrest till defibrillation attempt was several minutes. In ICDs, this time interval is very short, and defibrillation is most likely to be successful. The aim of our study was to ascertain if the characteristics of VF waveforms are related to the energy required for successful defibrillation. Additionally, we wanted to analyse the change of characteristics of VF waveform between induction and defibrillation attempt and effect of unsuccessful defibrillation on VF waveform.

METHODS. The patients undergoing implantation of ICD were included in our study. For each patient, an bipolar precordial lead, similar to the standard limb II lead was recorded with 12-bit resolution and sample frequency of 256 Hz. The recordings were analysed off-line using a virtual instrument made for the LabView environment. Dominant frequency (DF), median frequency (MF), amplitude (A) and root mean square of amplitude (RMS) of the VF waveforms and AMSA (amplitude spectrum area) were determined in a 4 second interval of VF waveform.

RESULTS. Thirty-nine patients were included. The DF and MF were significantly higher in patients where the energy required for successful defibrillation was lower (p=0.012, p=0.034 respectively). The parameters of VF seemed to diminish during VF (A p=0.037, RMS p=0.049, DF p=0.001, MF p<0.0001). The parameters of VF did not change significantly after unsuccessful defibrillation (A p=0.10, RMS p=0.10, DF p=0.28, MF p=0.15). A, AMSA and RMS had a negative correlation with age of the patients (at the induction of VF: p=0.0002, p=0.003, p=0.003; and before defibrillation attempt: all p<0.0001).

CONCLUSION. A higher dominant frequency and median frequency were significantly correlated with lower energy required for successful defibrillation. The parameters of induced VF changed during VF even in a short period of time observed. Unsuccessful defibrillation attempts did not change parameters of VF waveform significantly. Three parameters of VF observed correlated negatively with age which probably reflects reduced capability of conduction of action potential in aged.

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A RETROSPECTIVE STUDY ON TROPONIN I AS MARKER OF SEVERE HEART FAILURE IN EMERGENCY DEPARTMENT

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INTRODUCTION. Recent studies analysed cardiac troponin I (cTnI) as a marker in heart failure (HF).No-one studied the relation between cTnI and several clinical variables in HF. In this retrospective study, we examined the power of cTnI as diagnostic and prognostic marker in a large population of severe HF patients.

METHODS. We performed a retrospective analysis of records of HF patients discharged from ED from March to December 2002 by HF codes according to International Classification of Diseases, 9th (ICD).Were included 76 patients, 42 with cTnI neg.<0.05ng/ml and 34 with cTnI pos.>0.05ng/ml. The HF severity was founded on clinical variables (NYHA class). 108 patients were excluded because of incomplete data, renal failure, recent infections, and acute coronary syndrome. We used a 2nd-generation immunoassay test for cTnI (Dade Behring).The lowest concentration detected was 0,04ng/ml. Comparison between two groups were performed by t and chi-square test, among more groups by Anova test.

RESULTS. The two groups of patients with cTnI + and cTnI- were homogeneous for clinical characteristics (p>0.05).They differ for cTnI serum concentration (p<0.01), for Oxygen Saturation (p<0.01) and for NYHA (p<0.05). We divided our population into 5 groups using cTnI levels and we found significant differences between average of NYHA and Oxygen Saturation in these groups (p<0.01). In particular the patients with cTnI 0.3ng/ml had values of NYHA and SaO2 higher than patients with cTnI<0.3ng/ml. We found that HF patients with cTnI+ had had more relapses of HF in the past than HF patients with cTnI-(p<0.01).There were significant differences in days of hospitalization between these groups (p=0.05).

CONCLUSION. Our data show that patients with HF and elevated cTnI had a worse clinical presentation than those with HF and cTnI neg. These results could be explained by minor myocardial damage in HF; causes of damage are: fibrosis, hypoxia and apoptosis. cTnI for its high sensitivity and specificity for myocardial injury can be a good marker in HF. Limitations to our findings are: the use of an ICD codes database, other causes of myocardial cell damage (myocarditis and transient silent myocardial ischemia) and difficult to compare studies on cTnI made by different standardization immunoassay methods. However we believe our data result reliable, because their statistical power. Anyway we suggest further researches: large studies on the power of cTnI as marker in HF.
Grant acknowledgement: M.Bufalini Hospital

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INDUCTION OF MILD HYPOTHERMIA WITH INFUSION OF COLD (4 °C) FLUID DURING ONGOING EXPERIMENTAL CPR

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INTRODUCTION. Cardiac arrest and cerebral ischemia often leads to severe neurological deficit. Therapeutic hypothermia after successful resuscitation has shown to improve outcome of neurological state and to reduce mortality (1,2). Induction of hypothermia by infusion of ice-cold solution is an effective, inexpensive and easily administered method (3). It is believed that the earlier hypothermia is induced the better for neurological outcome. We studied the induction of hypothermia with infusion of cold fluid during ongoing cardiopulmonary resuscitation (CPR).

METHODS. Twenty anesthetized pigs were subjected to 8 mins of ventricular fibrillation followed by CPR. After randomizing into two groups, a hypothermic group (n=10), was given an infusion of 4°C Acetated Ringers solution 30 ml/kg at a rate of 1.33 ml/kg/min started after 1 mins of CPR. A control group (n=10), was given the same amount but at 22-24°C. All pigs received vasopressine (0.4 U/kg) after 3 mins. After 9 mins defibrillatory shocks were applied to achieve restoration of spontaneous circulation (ROSC). Core temperature and hemodynamic parameters were measured at baseline and repeatedly until 180 mins after ROSC. Cortical cerebral blood flow was measured continuously.

RESULTS. All pigs had ROSC except one animal in the hypothermic group. Reduction of core temperature was greater in the hypothermic group, on average 1.6°C ± 0.35 (std) versus 1.1°C ± 0.37 (p=0.009). There was no difference in cortical cerebral blood flow and hemodynamic parameters between the groups during CPR or after ROSC.

CONCLUSION. Inducing hypothermia with a large, rapid, intravenous, ice-cold infusion seems to be an effective method that can be started even during ongoing CPR.

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RESUSCITATION WITH A LOW MOLECULAR WEIGHT STARCH COMPARED WITH SALINE DURING INTESTINAL ISCHEMIA

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INTRODUCTION. Early circulatory changes in massive intestinal ischemia are mainly due to intravascular hypovolemia(1). There is still a debate concerning the optimal fluid solution, its amount, and timing of administration. We compared the administration of colloids and crystalloids solutions on regional and global hemodynamic variables in rabbits

METHODS. Sixteen anesthetized and ventilated rabbits were allocated into 2 groups. All animals were submitted to ligation of superior mesenteric artery (SMA) after baseline measurements. The Group I (n=9) received fluid resuscitation with lactated Ringer solution (LR), 12ml/kg/h and hydroxyethyl starch (HES6% MW200.000 D/0.5, Haes-Steril, Fresenius) 20ml/kg. The Group II (n=7) received fluid resuscitation with LR 36 ml/kg/h and normal saline 20ml/kg. Aortic (Qao)and QSMA flows were measured using ultrasonic flow probes. A segment from the ileum was isolated allowing the measure lactate released from the mucosa. Mean arterial pressure (MAP), Qao, ileal mucosal PCO_2 and serum and luminal gut perfusate lactate were measured each hour

RESULTS. Luminal gut lactate concentrations and PCO2-gap increased in both groups (from 0.7 ± 0.6 to 3.3 ± 1.6 mEq/l at 4h, group I; from 0.7 ± 0.7 to 3.2 ± 0.8 mEq/l at 4h, group II; from 0.25 ± 8.1 to 58 ± 46 torr at 4h group I; from 1.2 ± 8.1 to 49 ± 25 torr at 4h, group II; respectively) ($p<0.05$ for both) reflecting alterations in gut perfusion. No significant differences were found on MAP, Qao, serum bicarbonate, base excess and arterial blood lactate concentrations

CONCLUSION. Systemic hyperlactatemia indicating hypovolemia was prevented by both regimes of fluid resuscitation. Three times less volume of crystalloids solution was used in association with fixed doses of HES for fluid replacement during intestinal ischemia in rabbits

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INCREASED CORTICAL CEREBRAL BLOOD FLOW DURING CPR WITH A NEW DEVICE FOR MECHANICAL CHEST COMPRESSION

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INTRODUCTION. LUCAS is a new device for mechanical compression and decompression during cardiopulmonary resuscitation (1). The aim of this study was to compare the efficacy of this new device with standard manual external chest compressions when measuring cerebral cortical blood flow, cerebral oxygen extraction, and end-tidal CO2, as an indirect measurement of cardiac output. Drug therapy, with epinephrine, was eliminated in order to better evaluate the effects of chest compressions alone.

METHODS. Ventricular fibrillation was induced in fourteen anesthetized pigs. After an 8 mins non-intervention interval, the animals were randomized into two groups. One group received external chest compressions using a new mechanical device, LUCAS. The other group received standard manual external chest compressions. The compression rate was 100/min in both groups. Mechanical ventilation was resumed with 100 % oxygen during CPR. No epinephrine was given. After 15 mins of CPR, external defibrillatory shocks were applied to achieve ROSC. Cortical cerebral blood flow was measured continuously using Laser-Doppler flowmetry. End-tidal CO2 was measured using mainstream capnography.

RESULTS. Restoration of spontaneous circulation was achieved in 2 animals, one from each group. During CPR, the cortical cerebral blood flow was significantly higher in the group treated with LUCAS (p=0.041). There was no difference in cerebral oxygen extraction between the groups. End-tidal CO2, was significantly higher in the group treated with the LUCAS device (p=0.009).

CONCLUSION. Chest compressions with the LUCAS device during experimental CPR seem to result in a better cerebral blood flow and cardiac output than standard manual external chest compressions. These results strongly support prospective randomized studies in patients to evaluate this new device.

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NON HEART BEATING DONORS. AN EMERGENCY MEDICINE BASED KIND OF DONOR

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INTRODUCTION. Our hospital has settled from 1989 a specific policy ("code 9") to obtain donors from those people who die in the street or at home from sudden or unexpected death. On 2002 we performed the first lung transplant from a NHBD died out of hospital. CPR is the only way to maintain donor.

METHODS. Description: a)In addition to general criteria we stablished:1-Time known of cardiac arrest.2-Initiate CPR in <10 min. 3-Age 7-55 years (7-40 for liver, 7-50 for lung) 4 Known or supposed cause of death.5-Non-bleeding injuries in thorax and abdomen.6-Healthy aspect; no risk factors for AIDS.7-Assistance time <120 minutes. b)Once included, maintenance with CPRc)As soon as emergency staff includes an AD,HCSC transplant coordinator is advised, and he alerts the transplant team. d)Once in Emergency department, transplant coordinator gets judicial permission and family assent, and establish preservation manoeuvres (extracorporeal bypass with membrane oxygenation and specific manoeuvres for lungs. e)When harvesting finishes, receptors are selected.

RESULTS. In 2002,our hospital had 55 organ donors,46 AD and 9 Encephalic Death (EDD.In AD group 72 cadavers were evaluated,69 potential donors and 54 actual donors (15 were excluded).We obtained 104 kidneys,4 livers,12 lungs(10 for investigation and 2 were implanted to a human receptor),82 bones, 110 corneas, 38 tendons and 10 vessels. Quality of organs implanted from AD are as good or better than those obtained from EDD. Kidney function (serum creatinine level and amount of proteinuria are better)(p=0.02)in both for AD. Long term graft survival is longer for AD (p=0.001), and vascular rejection is lower (p=0.05). Livers has similar long term survival, and viability of liver is related to ischemia Result of lung transplant is excellent.

CONCLUSION. 1-It is of great interest settle AD programs in all countries in which laws allow it. 2-Organs and tissues are at least as good as EDD. 3-Role of emergency medicine is the cornerstone of this program. 4-Good results in terms of organ function are directly related to tissular perfusion during warm ischemia period and to excellence of CPR.

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NURSING TO PATIENTS RECEIVING CONTINUOUS VENOVENOUS HEMODIAFILTRATION (CVVHDF) TREATMENT IN ICU

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INTRODUCTION. The ICU at Ulleval University Hospital in Oslo, Norway, started CVVHDF treatment in 1996. Before implementing CVVHDF, guidelines were made. The aim of this study was to investigate if the existing guidelines for CVVHDF are evidence based.

METHODS. A systematic review of the literature. Key words: CVVHDF, haemodiafiltration and nursing. From the VIPS (Well-being, Integrity, Prevention and Safety) nursing documentation system the issues chosen to be investigated was consciousness, cardiovascular and renal system.

RESULTS. The literature review revealed important knowledge concerning consciousness, and the cardiovascular and renal system related to CVVHDF. Consciousness: Only 1-3% of the total amount of morphine is removed despite diffusability of free morphine. Cardiovascular system: The nurse must monitor the patient carefully during the administration of continuous heparin infusion when severe thrombocytopenia and high APTT are present. CVVHDF offers greater haemodynamic stability and volume control in critically ill, hypotensive patients than conventional haemodialysis and also results in fewer episodes of hypotension. It is possible to give the patient blood products, colloids and nutrition without risking volume overload. There may be a large volume exchange with haemofiltration, and accurate measurement of input and output is needed. Unless the re-infused fluid is warmed, some patients may present a fall in core temperature. Polyacrylonitrile membranes could theoretically remove inflammatory mediators if the membranes are changed frequently. Renal system: Metabolic acidosis and hyperkalemia are indications for CVVHDF. Hypophosphatemia may occur because of the absence of this in the dialysate fluid. It is recommended to start CVVHDF before the ICU patient's azotemia parameters are comparable with chronic renal failure.

CONCLUSION. CVVHDF guidelines should be reviewed on a regular basis based on the latest scientific evidence. Special attention must be paid to the use of anticoagulation, and strict electrolyte and volume control are necessary. The guidelines should include CVVHDF treatment, risks and outcomes for the patients.

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INCOMPATIBLE ASSOCIATIONS BETWEEN DRUGS AND SOLUTIONS ADMINISTERED INTRAVENOUSLY IN CHILDREN.

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INTRODUCTION. The incompatibility of medications is a physicochemical phenomenon that occurs with the association of drugs or solutions and causes loss of potency.[1] The objective of this study was to verify incompatible associations between drugs and/or solutions administered to children by intravenous (IV) catheter.

METHODS. This was a descriptive study performed in an university hospital in the city of São Paulo, Brazil. The sample consisted of 627 instances of IV therapy observed during the study period. For the data collection, all the actions of the nursing team in the administration of IV drugs and solutions to children were observed and recorded in a protocol.

RESULTS. Observations were made of 627(100.0%) instances of IV therapy, administered via 209 catheters installed in 178 children. The administration of 41 drugs, 18 different types of maintenance solutions and 9 total parenteral nutrition (TPN) was accomplished. There were 224(35.7%) administrations of associations, of which 145(23.1%) were between two drugs and/or solutions, 35(5.6%) between three, 27(4.3%) four, 13(2.1%) five and 4(0.6%) six. Of these associations, 87(38.8%) were compatible and 55(24.6%) were incompatible, while for 82(36.6%) their compatibility could not be identified in the literature. It was seen that the greater the number of associations was, the more likely it was that there would be incompatibility, since all associations between six drugs and/or solutions were incompatible, for five 76.9% were incompatible, for four 55.6%, for three 37.1% and for two 9.0%. The incompatibilities were identified more among the continuous infusions (63.6%). The drugs most related to incompatibility were midazolam, dopamine, furosemide, acyclovir and methylprednisolone, and among the solutions, calcium gluconate 10% and TPN. It is stressed that only a small number of the studies made on incompatibilities have included lower doses like those utilized for children in their investigations of incompatibility.

CONCLUSION. An incompatibility rate of 24.6% was verified from 224 associations between drugs and/or solutions. It was found that in 36.6% of these associations, the literature did not identify support for the practice.

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EVALUATION OF WORK CONDITIONS IN THE ICU

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INTRODUCTION. Half a century has passed since the beginning of the first ICU. Now it's time to evaluate the work conditions of the nursing stuff, which plays a crucial role in intensive therapy.

METHODS. An international questionnaire is answered by the nursing staff of one General ICU of adults and one of children in tertiary teaching hospital, which is biggest public hospital of Greece. It evaluates the relations between colleagues, the salary, the vocation, the necessity of specialization, the organization of their department, etc.

RESULTS. 30 nurses were asked (25 of adult ICU, 5 of children ICU). Mean time of working in ICU: 6 years, 56,7% were women, 23,3% men, 20% did not answer. The specific questionnaire contained 20 topics that generally mirrored the view of the nursing staff upon their work conditions. A frustration concerning the professional evolution runs against the pleasure of working in the ICU, whereas more than 50% chooses again the ICU, in order to offer their work. The specialized knowledge on the intensive care is a permanent, fixed request of all ICU staffs in Greece today, which –unfortunately- comes up against the lack of law – established education. Despite the technological evolution and the complicated medical management of the critically ill patient, there is an insufficiency in skills and education of the nursing staff.

CONCLUSION. Motives and rewarding are essential. An urgent need occurs for specialization in the nursing staff in our country, which is the corner-stone of the successful function of the ICU.

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A NEW METHOD OF COMMUNICATION IN MECHANICALLY VENTILATED PATIENTS

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INTRODUCTION. A major problem for mechanically ventilated patients is the inability to communicate with the nurses, physicians, paramedics, family and friends. It may result in feelings of fear and panic (1;2) and is a source of frustration for the care givers (3). Communication aids (letter board, sign language and lip-reading) often work insufficiently. Writing is a simple and effective means of communication, but frequently to difficult to perform. We evaluated to use of Intellikeys®, a modified keyboard with different keyboard templates, used as an expansion for a computer.

METHODS. The Intellikeys® was evaluated in 9 ventilated patients. Both the patient and the nurse compared the Intellikeys® with the alphabetical letter board (the most used method in our hospital). The patient was ordered to communicate to the nurse three simple sentences for example: "I want to look TV" and "I have pain". At random the letter board or the Intellikeys® was chosen as the first mode of communication.

RESULTS. Both the patients and the nurses were more satisfied with the Intellikeys®. The Intellikeys® scored better on effort, convenience as well as on contentment. Unfortunately, not all patients were able to communicate satisfactory with the Intellikeys®. To be able to use the keyboard, the patient must have sufficient muscle strength. Furthermore, especially older patients may have problems of getting used (in the beginning) to the Intellikeys®.

CONCLUSION. The Intellikeys® is simple device that improves the communication in ventilated patient and is more satisfactory then the alphabetical letter board. The patient can better express himself because he receives visual feedback from the computer screen immediately. In our ICU the Intellikeys® is incorporated in a specially designed "communication car". However, further studies are necessary before the widespread use in ICU's can be recommended.

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PRONING PATIENTS: WHY DO NURSES STRESS?

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INTRODUCTION. In the last years prone positioning has increased in ICU settings, speacially in some patients with acute respiratory insufficiency. This manoeuvre improves oxygenation and gas exchange. Although this positioning has been well documented, there is little information concerning difficulties and attitudes of nursing patients in this position. Prone position can induce stress and significantly increase workload on intensive care nurses. Nurse experience and notion can influence the stress factor and attitudes towards this positioning.

METHODS. Retrospective survey on 27 nurses of the Polivalent Intensive Care Unit (PICU), during the first term of 2003. A questionaire was distributed and then analysed. The objectives of this study were: to determine the attitudes of nurses towards this positioning and to determine some of the difficulties described by nurses on proning patients.

RESULTS. 90% of the inquired nurses expressed reluctance to use prone positioning. Proning patients does increase stress and workload on nurses. To prone patients causes anxiety and fear on nurses regarding ventilation, respiratory mechanics, hemodynamics and confort of the patient. One can decrease stress and improve nursing in this position by applying appropriate methods and techniques in this unusual positioning. Most of the inquired nurses felt that an established protocol for prone positioning would be useful.

CONCLUSION. Prone position optimizes the perfusion/ ventilation relation. Nurses must learn to consider this positioning as a common technique than can be achieved relatively easily. The main difficulties are related to the manoeuvre regarding the number of personnel and nursing care related to emergency procedures, pressure areas and suctioning. As a result of this study a guideline has been developed to help nurses.

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To be presented in a poster display session

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RAISED DECUBITUS: ACCURACY OF NURSING PROFESSIONALS' AND STUDENTS' ESTIMATES OF DEGREES OF ELEVATION

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INTRODUCTION. Raised decubitus, defined as the height of the bed headboard in relation to the degree of elevation above the horizontal position, is a nursing care that may affect the morbidity and mortality among seriously ill patients. The objective of this study was to verify nursing professionals' and students' accuracy in estimating the angles of elevation of the bed headboard.

METHODS. This was a descriptive and relational study performed in an university in the city of São Paulo, Brazil, from March to April 2003. The sample consisted of 160 participants. Before collecting the data, a device was developed for measuring the sizes of the angles investigated (20°, 30°, 35°, 40° and 45°), which were presented to the participants in a randomized manner. The data were analyzed by means of the Mann-Whitney and Friedman tests, with a significance level of 5%.

RESULTS. Of the 160 participants, 97(60.6%) were nurses, 48(30.0%) were undergraduate students and 15 (9.4%) were nursing auxiliaries, and 68(42.5%) had experience in intensive care. The median age of the participants was 24±10 years, and the median length of professional experience was 5±10 years. Of the total of 800 angles investigated, an average error of 8º±13.5, with a median of 5º was identified. The angle was estimated correctly in 119(14.9%) cases; in 493(61.6%) there was an overestimate; and in 188(23.5%) there was an underestimate. A statistically significant difference was found between the angles suggested and the magnitude of the errors encountered ($p<0.001$), since the bigger the angle suggested was, the greater the average magnitude of the error in the size of the angle, for 20º (2.4±10.2), 40º (10.7±14.5) and 45º (15.5±14.1). For 30º (5.5±12.1) and 35º (6.5±12.4) there were similar average errors. When the groups with and without experience in intensive therapy were compared, no significant difference was found for any of the angles investigated (20° $p= 0.286$; 30º $p= 0.475$; 35° $p=0.723$; 40º $p= 0.543$; 45º $p= 0.062$).

CONCLUSION. It was observed that the majority of the professionals overestimated the angle of elevation of the bed, with an average error of 8º±13.5. It was also verified that the bigger the angle suggested was, the greater the average error was and that experience in intensive care did not provide a greater number of correct estimates of the raised decubitus.

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INTENSIVE CARE OF CHILDREN SUBMITTED TO RENAL TRANSPLANT: BASIS FOR NURSING CARE IMPROVEMENT.

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INTRODUCTION. The renal transplant in the last decades has been presenting the principal treatment for children with end-stage renal disease, preventing death, improving quality of life and providing better reabilitation. After surgery some complications may be present and compromise the expected outcomes. The purpose of this study was to verify the main nursing care and complications identified during the intensive care treatment of children submitted to renal transplantation as bases for nursing care improvement.

METHODS. Retrospective study performed in a PICU of an university hospital in the City of São Paulo, Brazil. The data was obtained through patient medical charts between 1988 to 2002. In the studied period 111 children were submitted to this treatment and a sample of 44 was included in the study. The researched variables were: children's demographic characteristics, duration and type of intensive care and complications identified during the PICU permanence.

RESULTS. The data analyses demonstrated that 44(39.6%) children were admitted in the PICU, 56(50.4%) received care in the adult ICU, 4(3.6%) did not have intensive care and 7(6.3%) patient medical charts were not available. Children age was in median 10±3.2 years, 63.6% were males, and 61.9% Caucasians. The main nursing care, beyond standard assistance, was related to urinary bladder catheter maintenance (97.7%) and irrigation (54.5%), mechanical pulmonary ventilation (79.5%), invasive arterial blood pressure monitoring(56.8%) and, glicemia (68.0%). Complications were found in 43 (97.7%) children with a variation of one complication (13.9%; average of 27.3 hours in PICU), two (32.6%; 25.1 hours), three (32.6%; 30.1 hours) and four or more (20.9%; 47.8 hours), related to hypertension (56.8%), hematury (45.5%), fluid/electrolytic disturbance (29.5%),fever (25.0%), acid-base disturbance (15.9%), hypotension (11.4%), cardiac arrhythmia (9.1%), and other. In the children's group that presented four or more complications, was identified a greater proportion of acute rejection ($p=0.009$). The mean PICU lenght-of-stay was 31.4 hours and, the mortality rate was of 2.3%.

CONCLUSION. The results demonstrated that the majority of the children presented complications and that there was a significant relation between the number of complications and acute rejection.

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COMPARE SUNDRIES END-EXPIRATORY NOSE-CANNULAS TO THE CARBON DIOXIDE-MEASUREMENT BY EXTUBATED PATIENT

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INTRODUCTION. Through the increasing spread of the side-stream-spirometry ace waves ace Capnometrie the possibility emerges without invasive measures to oversee the respiration of spontaneously breathing patients monitor-pegged. Since nose-cannulas are offered some time to this purpose to the carbon dioxide-measurement of different manufacturers. This comparison-census was enforced in order to be able to judge the effectiveness of these nose-cannulas. In addition, pos-sible differences of these differently configured cannulas should be worked out.

METHODS. Was tried altogether 150 examination-rows, by means of, to determine the accuracy of meas-urement of the nasal probes mentioned already from altogether 20.000 blood gas-analyses as well as 20.000 measured EtCO2-Counters. In the framework of the census, we administered the patients different oxygen volumina over the Time period of in each case 30 minute over the probes. Arterial blood gas-analyses with at complete Acid-Base-Status became to twenty-one defined Time. Furthermore, following Measure parameters were documented to these time: SaO2, EtCO2, RR (blood pres-sure), RF (heart rate) as well as AF (Breathing frequent)

RESULTS. From the three investigated cannulas could only with two of the products that fill put criteri-ons in the advance. The two cannulas, which corresponded to the requests, showed EtCO2-rate which about 4 mm/Hg under the measured PaCO2-rate normally lay. With the third probe, EtCO2-rate will show which about up to 12 mm/Hg under the actual PaCO2 lay this corresponded to a difference from up to 25% under the real value and is not consequently ac-ceptable in the daily routine.Probes to the regulation of the EtCO2-rate which the end-breath in the pharynx measures, doesn't should on the basis of her/its/their inaccurate measurements in the daily routine-in-use to the comes to carry.

CONCLUSION. The measurement of the EtCO2- concentration makes possible a certain statement over the breath-activity with the spontaneously breathing extubated patient, respiratory frequency as also possible hyper - and hypoventilation. A routine application in the recovery room can in-crease the Patient' security exactly in the first postoperative time.

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HEALTH CARE PROVIDERS: DO THEY WASH THEIR HANDS?

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INTRODUCTION. Washing hands is a fundamental process in prevention of nosocomial infection and the real adherence of health care professionals are motive of research and studies. The aim of this study was to verify the health care professional applying the hand washing technique in NICU.

METHODS. A protocol was developed to check if the professional wash or not their hands, and if they apply or not the correct technique. The observations occurred when the professionals entered at the unit and before and after the procedures performed by them beside the newborn. The data collection was realized in 2002, august, in a amounted of 17 days. It was observed two hours per day, in the morning and evening, one hour for each period. The night shift was observed once for two hours. The total time of observation was 36 hours

RESULTS. The data reveal that in 198 times that professionals entered in the unit, 50.5% did not washed their hands. In 49.51% of professionals that washed their hands before entered to the unit, 79.6% did not used the correct technique. Among that did not washed their hands before entered, 61.3% did not washed their hands before procedures. The 36.47% of those that washed their hands before procedures, 55.24% did not used the correct technique

CONCLUSION. Considering the data obtained we can figure the difficulty still present inside hospital care units related to adherence of health care professional in washing hands issues.

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ANALGESY DETERMINATION BY NURSING STAFF PRIOR PROCEDURES IN PEDIATRIC AND NEONATAL INTENSIVE CARE

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INTRODUCTION. To minimize the suffer is one of the most relevant aspects of nursing care of children submitted to invasive procedures, mechanical ventilation, parents separation and interruption of awake sleep cycle in NICU [1] . To identify, recognize, prevent and treat the pain is part of nursing accountabilities. The aim of this study was to identify in which procedures determining the decision making of analgesia by nursing staff .

METHODS. Prospective survey , realized in two ICU of teaching hospital from São Paulo City, Brazil. It was applied a questionnaire to all nursing staff qualified to realize analgesia by drugs in children of PICU and NICU. The questionnaire included variables related to professional category, time of working in IC, kind of realized procedures, has been 7 related to respiratory assistance, 7 of corporal manipulation, 5 general invasive procedures, 4 of wound dressing and 7 of vascular invasive procedures, associates with the judgement of analgesia necessity for each one of aspects selected.

RESULTS. In a total of 45 professional population 24 was from NICU and 21 from PICU and 66.66% composed the sample. In the group of respiratory assistance procedures, 45.05% of PICU professional and 95.74% of NICU do not realize analgesia and 32.26% of PICU answered that realized it sometimes. In corporal manipulation procedures, 51.64% of PICU professionals and 94.11% of NICU do not make decision of analgesia. In invasive procedures, 36.92% of PICU professionals and 89.41% of NICU do not make decision of analgesia, 30.76% of PICU almost never and 37.69% sometimes do it. In wound dressing, the majority 42.30% of PICU professionals implement analgesia sometimes and 72.05% of NICU do not realize it. Related to vascular procedures 50.54% of PICU professionals and 94.95% of NICU do not realize the analgesia. It was checked with the participants if analgesia would be necessary before the procedures described and the majority of nursing professional of NICU (62.35%) do not believes necessary and in PICU (74.61%) did not know.

CONCLUSION. The data obtained showed that the kind of procedure does not determine the decision making process to implement analgesia. Despite of children pain under treatment we can notice that analgesia implementation is higher in PICU than NICU.

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A RETROSPECTIVE ANALYZES OF RENAL TRANSPLANT IN A PEDIATRIC INTENSIVE CARE UNIT.

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INTRODUCTION. Renal transplant has been described as the best treatment for children with end-stage renal disease. Several studies performed in different countries demonstrated that the pediatric renal transplant outcomes are affected by recipient, donor and surgical procedure characteristics. The purpose of this study was to analyze renal transplantation outcomes of children admitted into a PICU.

METHODS. Retrospective study, by which data was obtained trough medical charts of children admitted to a PICU of an university hospital in the City of São Paulo, Brazil, between 1988 and 2002. In the investigated period, 111 children were submitted to renal transplant in the hospital, of which, 44(39.6%) had ages ranging from 0 to 18 years and were admitted into the PICU. The studied variables were related to recipient and donor demographic characteristics, dialysis therapy before transplant, surgical procedure, intensive care treatment, and transplant outcomes. The data obtained was submitted to statistical analyses (significance level of 5%).

RESULTS. The children submitted to renal transplant had a median of 10±3.2 years, 63.6% were male and 61.9% Caucasians. In relation to the dialysis therapy before transplant, 21 (47.7%) utilized CAPD, 15 (34.1%) hemodialysis, 7(15.9%) IPD, and in 1 (2.3%) case dialysis therapy was not identified. The donors median age was 17.5±12.5 years, 51.3% were male, 56.8% Caucasians, 70.5% were cadaver donors, whose principal cause of death was brain trauma (50.0%). The average of cold ischaemia, surgery and, anesthesia time were, respectively, 20.8, 3.8 and, 4.5 hours. The imunossupressor therapy was primarily composed of triple scheme (88.3%), 6.8% utilized heparin, 6.8% low molecular weight heparin, and cephalosporins was the most (90.1%) administrated prophylactic antibiotics. The average PICU and hospital length-of-stay was 31.3 hours and 22.4 days, respectively. The transplant outcomes were 2 (4.5%) deaths, 11 (25.1%) graft losses, 22 (50.1%) acute rejections, 3 (6.8%) late rejections and, 16 (36.4%) regress to dialysis. There were identified significant relations between graft losses and cadaver donor transplant (p=0.019).

CONCLUSION. The data showed that the majority of the children were school age, male, Caucasians, and utilized CAPD before transplant. The donors were principally cadavers, adolescents, males, and Caucasians. The acute rejection was the main outcome identified in 50.1%. The graft losses were significantly related to cadaver donor transplant.

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NOSOCOMIAL PNEUMONIA IN THE ICU: BIG WORDS IN A „SMALL WORLD“

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INTRODUCTION. Nosocomial infections are defined as acquired infections during or as a consequence of an hospitalization. Patients with an increased risk of contracting a nosocomial respiratory infection are those admited to an ICU speacially the elderly, those with endotracheal or naso-gastric intubation, those with chronic respiratory disease and those that are unconscious. Respiratory infections represent one of the leading conditions that increase the morbidity and mortality of patients on ICU settings. The incidence of pneumonia in those patients represents 15%-60% with a mortality somewhere between 20%-50%. Given these figures it is imperative that all the health team, working in an ICU, should adopt all the necessary procedures for the diagnosis, treatment and profilaxys of nosocomial pneumonias.

METHODS. Retrospective study, covering a three year period (2000-2002),of nosocomial pneumonias in the ICU of Hospital Fernando Fonseca. The objectives in this study are: to investigate the incidence of nosocomial pneumonias on the ICU of Hospital Fernando Fonseca; to compare international guidelines and protocols with those in use in our ICU and up to date specific protocols in order to prevent those nosocomial infections in our ICU enviroment.

RESULTS. In the three years studied were identified 16,5% (36 cases in 218 patients admited) of nosocomial pneumonias in 2000, 13% (34 cases in 260 patients) in 2001 and 11,7% (37 cases in 314 patients)in 2002.

CONCLUSION. In this survey we conclude that the incidence of nosocomial pneumonias in our ICU is below international average. We also verified that international guidelines are similar to those applied in The ICU of Hospital Fernando Fonseca.

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ENTERAL FEEDING TUBE OCCLUSION IN CRITICAL CARE UNIT

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INTRODUCTION. The critically ill patients nutritional support is frequently administered by an enteral feeding tube.However, many factors may lead to the occlusion of the enteral feeding tube and interrupt the administration of nutrients or medications.This study had the objective of identifying both the occurrence of enteral feeding tube occlusion and the possible association between this event and any variables.

METHODS. This study consisted of a descriptive and prospective methodology, and was carried out in both the critical care and coronary care units of a private cardiological hospital located in São Paulo,Brazil.The sample comprised 60 patients,either surgical or not,and receiving enteral nutrition by continuous infusion through a 8 -French gauge polyurethane tube.The exact test of Fisher ($p<0.05$) was applied to verify whether the variables focused on were associated with the studied event.

RESULTS. The enteral feeding tube occlusion occured for five patients and the statistical analysis showed that the decreased enteral nutrition inflow and the difficulty in flushing enteral feeding tube with water were associated with the event.

CONCLUSION. Despite the patients having received various types of drug via an enteral feeding tube and a smaller amount of water having been used to guarantee the free flow through the tube,the number of occlusion occurrences coincided with the range described in the literature.Therefore,the adoption of a protocol for flushing the enteral feeding tube in order to keep the free passage through it seemed to be a key factor for the small number of occurrences for these patients.

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ADVANCED LIFE SUPPORT - AN ICU-NURSE QUALIFICATION WHICH NEEDS REGULAR UPDATING

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INTRODUCTION. ICU nurses, obviously, must possess basic skills of advanced life support. However, in our 8 beds ICU, on average we have 17 cardiac arrests a year; consequently the nurses get insufficient exposure to train and withheld skills' proficiency. This fact and the appearance of new international guidelines for ALS prompted us to evaluate the intervention of introducing the new guidelines by the means of theory and practice. A questionnaire and practice testing revealed that Protocol directions were not generally followed. One important obstacle was confusion about roles (who should do what). By teaching and implementing Protocol procedures on a mannequin we hoped to render the nurses more effective and confident in resuscitation procedures. During practical training groups of 3 nurses were to handle a VF on the simulator mannequin placed in an ICU bed.

METHODS. 37 nurses were at the first session; 31 nurses were at the second session, 25 of them at repetition session. These 25 nurses are the basic for the results. The evaluation of our intervention was quantitative and qualitative: Pretest: Prior to theory and practice sessions a questionnaire (14 multiple-choice questions with 16 right answers) was given to all nurses. Teaching of protocol at small groups of 3 nurses. Practical training at simulator mannequin. The teamwork and handling the protocol were supervised and subsequently evaluated. After 6 months at second session they were given: A similar multiple-choice test and practical training at simulator mannequin once again supervised and subsequently evaluated. Educational nurse interviewed 5 nurses by interview guide between the sessions. Interviews were taped, transcribed and analysed.

RESULTS. The nurses' knowledge of CPR had improved from 8.8 right answers in pretest to 10.2 right answers 6 months later at second session. It was clearly to every nurse what role she had in the 2nd practical training. The nurses expressed that the simulation training helped them to retain composure during heart arrest situations. There was no correlation between theoretical knowledge and time elapsed since last participation in ALS.

CONCLUSION. 17 heart arrests in our ICU a year is a too small number to maintain nurse skills of resuscitation at a satisfactory level. Knowledge of CPR without training is not sufficient to ensure effective CPR. Practical training is effective to ensure that the Protocol is followed. The nurses welcome the training. Training improves in nurse performance in ALS.