ABDOMINAL EDEMA IN EXPERIMENTAL SEPSIS: EFFECTS OF MECHANICAL VENTILATION

INTRODUCTION. Major efforts have been spent on improving oxygenation in acute respiratory failure. However death is rarely by hypoxemia but by abdominal organ failure. We have shown that abdominal lymph drainage is impeded with mechanical ventilation [1] and this raises the question whether abdominal edema is increased during mechanical ventilation.

METHODS. Twenty 2.3 months old pigs with a mean weight of 28 kg were studied during anesthesia and mechanical ventilation. A sepsis-like condition was created by continuous infusion of lipopolysaccharide. LPS, and the pigs were followed for 6 hours. 99mTc-labelled red blood cells were used as an intra-vascular marker and 111In-labelled transferrin as an intra- and extravascular marker of abdominal fluid as detected by gamma-camera technique.

RESULTS. Healthy pigs showed a slight increase in free abdominal fluid over a 6-hour study period. LPS caused a three-to-eight fold increase in the rate of ascites formation and abdominal organ swelling. Mechanical ventilation (MV) with a low level of end-expiratory airway pressure (PEEP of 5 cmH2O) increased abdominal fluid formation by 10% compared to spontaneous breathing (SB). MV with PEEP of 15 cmH2O caused a significant rise by 80% compared to SB (p<0.01) and also liver swelling. Free fluid estimation followed to post mortem measurements (p<0.05).

CONCLUSION. With the double isotope technique, abdominal edema formation can be followed continuously in experimental conditions. Moreover, abdominal edema formation is enhanced by mechanical ventilation and in particular with PEEP. The findings suggest that the most commonly used techniques for improving in oxygenation in acute respiratory failure worsen abdominal fluid balance with organ swelling and increased ascites. The consequences of this have to be studied.

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Grant acknowledgement. Supported by grants from the Swedish Medical Research Council (5315) and the Swedish Heart and Lung Foundation.

HIGH FREQUENCY OSCILLATION VIA A DOUBLE LUMEN TRACHEAL TUBE

INTRODUCTION. We have evaluated the use of a valved double lumen tracheal tube in a laboratory model of high frequency oscillation. It was compared with a 9.0 mm OD single-lumen tracheal tube in the same model, applying similar tidal volume and mean airway pressure to a dummy lung that had an inflow of 1.1 l/min carbon dioxide.

METHODS. The dummy lung was ventilated at maximum ventilator power through the novel device, with respiratory frequencies of 3.5, 5, 6.5, 8 and 10 Hz. The novel device was replaced with a standard tracheal tube and the power was adjusted to obtain the same pressure in the lungs as had been obtained with the novel device. Equivalence carbon dioxide level during the lung was measured.

RESULTS. The carbon dioxide level within the lung at each respiratory frequency with the novel device and with the standard tracheal tube are shown in table 1.

| Respiratory Frequency (Hz) | CO2 Levels (kPa) |
|---------------------------|------------------|
| 3.5                       | 4.4              |
| 5                         | 5.6              |
| 6.5                       | 6.7              |
| 8                         | 8.3              |
| 10                        | 10.5             |

CONCLUSION. The valved double lumen tracheal tube allowed a higher rate of elimination of carbon dioxide from the test lung than did the standard tube.

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A RANDOMIZED TRIAL OF INVERSE RATIO VENTILATION VERSUS PEEP IN THE INITIAL TREATMENT OF SEVERE ARDS

INTRODUCTION. Pressure-controlled inverse ratio ventilation (PCIRV) has been shown to improve oxygenation in acute respiratory distress syndrome (ARDS). However, PCIRV is frequently administered during the conventional positive end expiratory pressure ventilation (PEEP) has failed. Our previous research showed that PCIRV could be safely used within 3 days after onset of ARDS and patients had an improved outcome [1]. In this study, a randomized controlled trial was designed to compare the benefits and outcomes of severe ARDS patients managed with PCIRV and conventional PEEP from the onset of ARDS.

METHODS. Forty-four consecutive patients who developed ARDS within three days of admission to the surgical intensive care unit (SICU) were enrolled and randomly assigned to PEEP group or PCIRV group. We calculated the APACHE II, TISS and lung injury score (LIS). In addition, PaO2/FIO2, respiratory index (RI), lung compliance, mean airway pressure (MAP), peak inspiratory pressure (PIP), minute volume (MV) and PaCO2 were measured on hours 0, 3, 6, 12, and 24 after PEEP or IPB is set in ventilatory parameters, patients’ characteristics and outcomes were compared between these two different groups of ventilations strategies.

RESULTS. Twenty-two patients were ventilated with PEEP and the other twenty-two with PCIRV. There were no significant group differences of age, APACHE II, TISS, serum albumin, and onset data of ARDS including PaO2/FIO2, LIS, lung compliance, RI, MAP, PIP, MV and PaCO2. Length of stay in SICU), total duration from onset time to ventilator off, and mortality rate in PEEP/PCIRV were 21.2±10.1/19.8±9.5 days, 17.6±9.2/21.8±6.1/10.0 days, and 18%/18%/14/22, and all showed no significant difference between groups. The patients who ventilated with PCIRV had significantly lower LIS, PIP and MV, and had significantly higher MAP on hours 3, 6, 12, and 24 hours. Sepsis (26/44) was the main cause of our patients developing ARDS.

CONCLUSION. Administration of PCIRV for the initial treatment of severe ARDS is safe and effective to improve oxygenation and reduce PIP and MV in the first 24 hours from the onset of ARDS. This is beneficial for those patients who have high peak inspiratory pressure and also compatible with the policy of ventilator protective strategy in ARDS patients. PCIRV can be used as a primary mechanical ventilatory therapy in patients with ARDS, not only as an alternative.

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0450
THE EFFECT OF CMV VS. HFOV ON OXYGENATION AND LUNG COMPLIANCE IN A MODEL OF ARDS
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INTRODUCTION. The target group for HFOV treatment has not been identified yet. The aim of our study was to determine the impact of CMV/HFOV on lung compliance (Cst) and P/F index (PaO2/FiO2 ratio) in oleic acid and chest and abdomen wall injuries (Cawi), i.e. a lesson similar to extrapulmonary form of ARDS.

METHODS. Ten laboratory rabbits were instrumented under general anaesthesia. Lung lesion was induced by intravenous oleic acid administration (0.1 ml/kg B.W) to reach P/F index below 200. Cawi was induced by pressure cuff (2 kPa) placed around the chest and abdomen. All animals underwent 4 step protocol with normocapmic CMV (f=100/min, V=7 ml/kg) and normocapmic HFOV (f=8 Hz, V=2-2.5 ml/kg). The variable parameters were PEEP MAP or Cdp, lung lesion and Cawi. Step 1 - CMV (PEEP=0.8 and 1.2 kPa). Step 2 - CMV (the same setting) + pressure cuff 2 kPa. Step 3 - HFOV (Cdp=1.5, 2.0 and 2.5 kPa). Step 4 - HFOV (the same setting) + pressure cuff 2 kPa. A designed system for CMV and HFOV monitoring was used for airway and oesophageal pressures, airflow, Vt, Cst, Ccw and Cst continuous measurement [1], its accuracy was validated using Galileo (Hamilton) ventilator. Cst, Ccw, blood gases and acid base balance were evaluated (Wicokos test).

RESULTS. Step 1: Increasing PEEP during CMV increased P/F from 126 to 210 (p<0.05). Cst remained constant. Step 2: CMV failed to increase P/F and Cst. Step 3: The improvement of P/F from 121 to 301 and 169 (p<0.01) with increasing Cdp in spite of sustained Cst decrease (19, 15 and 11 ml/kgPa, p<0.01). Step 4: Improvement of P/F (52, 61 and 269 (p<0.05) occurred at the highest Cdp. Cst changed to 14, 20, 17 ml/kgPa (NS).

CONCLUSION. In the lung lesion without Cawi there is no difference in oxygenation efficiency between CMV and HFOV (NS). The best oxygenation during HFOV was reached at high Cdp levels when Cst was reduced, i.e. behind its maximum value. When Cawi is present, HFOV is more efficient in oxygenation gain compared to CMV (p<0.05).

REFERENCE(S). [1] Pacht, J. et al. Normocapnic high-frequency oscillatory ventilation affects differently extrapulmonary and pulmonary forms of acute respiratory distress syndrome in adults. Physiol. Rev. 55 (1): 15-24, 2006.

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0452
ADAPTIVE SUPPORT VENTILATION (ASV) AUTOMATICALLY ADAPTS A PROTECTIVE VENTILATION IN ARDS PATIENTS.
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INTRODUCTION. Adaptive Support Ventilation (ASV) is an automatic mode of ventilation in which Minute Volume is controlled through an individual tidal volume (VT) – respiratory rate (RR) combination based on breath by breath estimation of the respiratory mechanics [1]. This prospective observational study verifies if the VT delivered by ASV is in line with the actual recommendations regarding protective ventilation in ARDS (2) as well as the possibility with ASV to follow changes over time in patient’s mechanics.

METHODS. ARDS patients ventilated for less than 24 hours were included. ASV was the primary mode of ventilation. PEEP was set to 2 cmH2O above the lowest inflection point. Minute ventilation was set to achieve a PaCO2 between 40 and 45 mmHg with permissive hypercapnia allowed if plateau pressure (Pplat) was above 30 cmH2O. Data were recorded on 6 a.m. during the first week of ventilation. Results are given with mean ± SD.

RESULTS. Over 12 months, 45 patients were included (SAPS II: 50, PaO2/FiO2: 125 ± 57 mmHg, PEEP: 12 ± 4 cmH2O). Mean Pplat was 28 ± 5 and 25 ± 4 cmmH2O on the 1st and 3rd day of ventilation respectively. Distribution of the VT over time is shown on the figure. Duration of ventilation and stay in ICU were 12 ± 20 and 15 ± 20 days respectively. ICU mortality rate was 40%.

CONCLUSION. In almost 60% of the patients ASV selected automatically a VT below 8 mL/kgPBW and follows the changes over time in patient’s condition.

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0451
HIGH VS LOW PEEP IN ACUTE RESPIRATORY DISTRESS SYNDROME: EFFECT OF INTRINSIC PEEP
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INTRODUCTION. The recent ALVEOLI trial showed no difference in outcomes of patients with acute respiratory distress syndrome (ARDS) ventilated with two levels of positive end-expiratory pressures (PEEPmax and PEEPmin). In that study, PEEP was set according to preset tables, without taking into account intrinsic PEEP (PEEPi). We wanted to evaluate: 1) if the amount of PEEPi could be influenced by the level of PEEP applied according to the ALVEOLI protocol, and 2) the effects of high vs low PEEP on airway pressures, respiratory mechanics, and gas exchange.

METHODS. Nine paralyzed patients with early ARDS (<24h) were enrolled. Each patient was ventilated according to the ALVEOLI protocol (VT 5.5±0.5 ml/kg IBW, RR 33±3 b/min) with both PEEPmax and PEEPmin applied for 1h in random order. PEEPs, tidal PEEP (PEEPtot), peak and plateau pressures (Ppeak, Pplat), change in end-expiratory lung volume (DeEELV), static compliance (Cst), and gas exchange were measured at the end of each PEEP step.

RESULTS. Difference between PEEPtot was smaller than that between external PEEP (3.4±2.4 and 6.2±2.2 cmH2O, p<0.05).

REFERENCE(S). [1] Pacht, J. et al. Normocapnic high-frequency oscillatory ventilation affects differently extrapulmonary and pulmonary forms of acute respiratory distress syndrome in adults. Physiol. Rev. 55 (1): 15-24, 2006.

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0453
THE RELATIONSHIP BETWEEN LUNG COMPLIANCE AND OXYGENATION DURING CMV AND HFOV IN EXPERIMENTAL ARDS
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INTRODUCTION. In clinical practice, pressure parameters (mean airway pressure MAP and PEEP) are usually set higher during HFOV than during CMV. The aim of the study is to evaluate relationship between oxygenation, lung compliance (Cst) and alveolar PEEP (PEEPalv) in oleic acid model of ARDS during CMV and HFOV.

METHODS. Five anesthetized and mechanically ventilated rabbits were investigated. ARDS was induced by oleic acid (0.08 ml/kg iv). Ventilatory parameters to maintain normocapnia for CMV f=100/min, V=5.6 ml/kg B.W., PEEP was increasing from 0 to 1.6 kPa by 0.2 kPa steps (using a special monitoring system [1] allowing also Cst, Ccw and Caw monitoring, accuracy evaluated with Galileo (Hamilton) ventilator). Normocapnic HFOV: f=860/min, V=3.4 ml/kg B.W., PEEP level was set in the same way. The measurements: Paw, Pes, Vt, Cst, PEEPalv and hypoxic index PaO2/FiO2 (PFv). The results were statistically evaluated (Wicokos test). Values are expressed as mean ± SD.

RESULTS. The curve of Cst shows increasing and decreasing arms during increasing PEEP level. There is no significant difference in PEEPalv for highest Cst and lowest oxygenation (best PEEP, respecting circulatory stability) during CMV (the highest value of Cst=27±4 ml/kgPa where PEEP=38±134 Torr vs. the highest PEEP=449±146 Torr where Cst=28±5 ml/kgPa, p=0.4, NS). In HFOV, Cst at the optimal level of PEEPalv for oxygenation (best PEEP, also respecting circulatory stability) was significantly lower than the best achieved Cst (Cst=17±2 ml/kgPa and PEEP=483±61 Torr for the best oxygenation vs. Cst=26±5 ml/kgPa and PEEP=141±91 Torr for the best Cst, p<0.05).

CONCLUSION. The optimal level of PEEPalv for oxygenation during CMV correlates with the best value of PEEPalv for maximum Cst. During HFOV, the optimal PEEP was found at the decreasing limb of the Cst curve in dependency on PEEPalv. The results may also evoke a question about position of PEEPalv with respect to the upper inflection point during HFOV.

REFERENCE(S). [1] Pacht, J. et al. Normocapnic high-frequency oscillatory ventilation affects differently extrapulmonary and pulmonary forms of acute respiratory distress syndrome in adults. Physiol. Rev. 55 (1): 15-24, 2006.

Grant acknowledgement. Supported by IGA NR 8078-3 and MSM 6840770012.
**0454**

**COMBINED HIGH FREQUENCY OSCILLATORY VENTILATION AND TRACHEAL GAS INSUFFLATION IN PULMONARY ARDS**

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**INTRODUCTION.** In acute respiratory distress syndrome (ARDS), high frequency oscillation (HFO) improves oxygenation relative to conventional ventilation. Also, tracheal gas insufflation (TGI) may improve alveolar ventilation. We hypothesized that TGI may enhance gas exchange efficiency during HFO.

**METHODS.** Eleven, anesthetized and paralyzed patients with early (< 72 hours of onset), severe ARDS were ventilated twice for 2 hours with TGI and without TGI (6-8 L/min = 50% of the preceding baseline minute ventilation) in random order. Both HFO sessions took place within 24 hours. Baseline ventilation before and after TGI was according to the ARDSNet protocol. Mean airway pressure during HFO was set at 1.2 cmH2O above the point of maximal curvature change of the respiratory system’s expiratory pressure-volume curve. Radial and pulmonary artery pressure, mixed venous oxygen saturation (SvO2), and cardiac index were monitored continuously.

**RESULTS.** Table 1 displays main results. HFO-TGI improved PaO2/FiO2 versus both standard HFO and baseline ARDS Network ventilation. During standard HFO, PaO2/FiO2 was also higher relative to baseline ventilation. During HFO-TGI, shunt fraction and SvO2 were lower and higher relative to baseline ventilation, respectively. Oxygenation improvement was maintained for 1.5 - 2.5 hours following return to baseline ventilation. Hemodynamics were unaffected by ventilatory technique.

**CONCLUSION.** In pulmonary ARDS, the HFO-TGI combination may be recommendable as a maximally effective rescue oxygenation method.

Grant acknowledgement. Funding was from Thorax Foundation.

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**0455**

**EFFICACY OF DIFFERENT PATTERNS OF RECRUITMENT MANEUVERS IN PRIMARY ARDS**

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**INTRODUCTION.** Aim of this study was to test different recruitment maneuvers (RM) achieving the same time pressure product on alveolar recruitment and hemodynamics.

**METHODS.** 20 pts with primary ARDS were recruited (12M/8F Age 50±8 years 72±8, APACHE II 30±9). All pts underwent cardiac monitoring with a Swan Ganz. Patients were ventilated in pressure controlled mode to a VT of 6 ml/kg, FiO2 0.6, Peep 10, RR 14, Pplateau < 30 cmH2O according to the ARDSNet trial. Patients were randomised in two groups one received sustained inflation (SI) the other Pressure Control Ventilation (PCV) recruitment. SI was achieved by raising peak inspiratory pressure to 45 cmH2O for 40 sec. PCV was set to deliver 45 cmH2O peak inspiratory pressure for 2 min if I/E 1:2 Peep 16 RR 8/min. Pressure and time may be determinants factors influencing recruitment so we used a similar pressure-time product (PT product=1800). Mean values were compared by simple t-Test. Level of significance was set at 5%.

**RESULTS.** Oxygenation and hemodynamic response before and after different recruitment maneuvers are shown in Table 1. Lung Injury Score (LIS) was always > 2.5.

**CONCLUSION.** In this setting PCV-RM method caused major increase of PaO2 and less hemodynamic effects. Our data suggest that despite equivalent peak pressure and PT product, the pattern with which this pressure is applied is important. Although the reason for this is not clear, multiple high pressure breaths may be needed to achieve full benefit and airway opening may proceed in a series of avalanches. Such behaviour might explain why several RM may be needed for full effect. Prolonging the time over which maximum pressure is held exposes the vasculature to high pressures and consequently to ventilator loading conditions that adversely affects cardiac output. A PCV pattern attaining the same plateau pressure and PT product with lower mean airway pressure was better tolerated.

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**0456**

**ACUTE CARDIORESPIRATORY EFFECTS DURING STEPSWING RECRUITMENT MANEUVER**

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**INTRODUCTION.** Lung recruitment maneuvers (RM) are generally believed to be well tolerated, although extensive information has not been available concerning its hemodynamic effects. We designed this study to assess the cardiorespiratory events during a progressive RM in patients with acute respiratory failure.

**METHODS.** Patients with acute hypoxemia, bilateral pulmonary infiltrates and need of high PEEP/FiO2 levels were selected. Stepwise RM consisted of 3-min. steps of tidal ventilation with fixed pressure control and progressive increments of PEEP until a maximal value of 36 cmH2O. PEEP was then progressively decreased until maximal respiratory compliance (Cr) was achieved (optimal PEEP). Hemodynamic and respiratory changes were registered continuously and simultaneously using an oesophageal echodoppler (Hemosonic 100, Arrow Int'l, USA) and MCOVX respiratory module (Date-Omhoisa, Finland) connected to the patient monitor. Duration of RM was 45±5 mins.

**RESULTS.** 9 patients were selected. Hemodynamic and respiratory changes are summarized in the table.

**TABLE 1.**

| MANEUVER   | PaO2/FiO2 (mm Hg) | PaCO2 (mm Hg) | SvO2 (%) | Shunt Fraction |
|------------|------------------|---------------|----------|---------------|
| ARDS Network 1 | 109 ± 4.3       | 496 ± 1.6     | 69.9 ± 1.8 | 0.42 ± 0.02   |
| HFO-TGI     | 184.5 ± 11.2 a  | 533.1 ± 1.6   | 77.6 ± 1.4 a | 0.33 ± 0.02 a |
| Standard HFO | 141.3 ± 10.9 a  | 492.0 ± 1.9   | 75.8 ± 1.3   | 0.38 ± 0.02   |
| ARDS Network 2 | 109.7 ± 4.0 f   | 492.2 ± 1.5   | 71.5 ± 1.5   | 0.41 ± 0.02 f |

Values: Mean ± SEM; *P < 0.05 vs. ARDS Network 1; †P < 0.05 vs. HFO-TGI

**CONCLUSION.** In this model of recruitment maneuver, decremental PEEP trial was associated with a significant improvement in lung compliance and a decrease in systolic volume with regard to the same level of PEEP on the incremental branch. Due to an increase in heart rate and systemic vascular resistance, arterial pressure and cardiac output were not reliable parameters to detect hemodynamic rearrangements during lung recruitment maneuver.

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**0457**

**EFFECT OF SLOW RECRUITMENT MANOEUVRES USING HFOV IN ADULT WITH ARDS: A RETROSPECTIVE STUDY**

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**INTRODUCTION.** Recruitment maneuvers (RM) during high frequency oscillatory ventilation (HFOV) are increasingly used in ARDS, but the efficacy in terms of gas exchange and oxygen delivery (DO2) is still controversial. We studied the effects of a standardised protocol of slow RM (SRM) on gas exchange, haemodynamics and DO2 in patients with ARDS who received HFOV as a rescue treatment after failing conventional mechanical ventilation (CMV).

**METHODS.** SRM were performed by progressive increments of mean airway pressure (mPaw) starting from the mPaw on CMV + 5 cmH2O, by increments of 3 cmH2O every 10 min until a mPaw of 50 cmH2O was reached or haemodynamic instability ensued. Subsequently, mPaw was reduced by 2 cmH2O every 5 min until optimal mPaw was established on gas exchange.

**RESULTS.** 8 patients with ARDS (17 extrapulmonary, 11 pulmonary), with a median (range) age of 53.7 (27 to 86) yrs, who underwent CMV prior to HFOV for 3.5 [0-32] days were enrolled. Prior to HFOV, patients had a median (IQR) PaO2/FiO2 of 90 [70 to 113] mmHg, a PaCO2 of 54 [47 to 61] mmHg with a compliance (Cr) of 28 (18 to 36) ml/cmH2O. Following the SRM, there was a 71% increase [9.0% to 112%] in PaO2/FiO2 from a median of 69 to 124 mmHg (p<0.001), with no change in DO2 (801 ± 811 ml/min). There was no difference in PaO2/FiO2 at baseline and post-SRM between the two ARDS groups. Despite an overall improvement in PaCO2 of -0.2% (-2.2% to +4.6%), the change was not statistically significant. Patients with pulmonary ARDS had a significantly lower Cr (17 [5 to 31] ml/kg/min vs. 0.08), and a greater CO2 clearance post-SRM (218% vs. 4.7%; p=0.035), despite similar baseline PaCO2 (55 Vs 54 mmHg). Overall, patients with lower Crs had a trend towards a greater change in PaCO2 post-SRM (-20.5% Vs. -2.4%; p=0.08), and the change in PaCO2 post-SRM correlated with the change in Crs post-HFOV (r=0.6; p=0.048). Although patients with early HFOV (<1 day) had a greater improvement in PaO2/FiO2 (112% Vs 45%) and reduction in PaCO2 (-3% Vs -0.7%) post-SRM, these differences were not statistically significant.

**CONCLUSION.** SRM with HFOV are effective in improving oxygenation without adverse effects on DO2. SRM are associated with a decrease in PaO2, particularly in patients with pulmonary ARDS or with lower Crs, possibly indicating greater alveolar recruitment.
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**0458**

**VARIABILITY OF THE PULSED PRESSURE FOR PREDICTION OF THE INSTABILITY AFTER RECRUITMENT MANEUVERS**

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**INTRODUCTION.** The alveolar Recruitment Maneuver (RM) has showed oxygenation improvement in critical care conditions. There is controversy about security and the long term consequences. It is known the potential of RM to induce hemorrhagic instability in patient, with very serious consequences. Correct identification of possible instable patients is vital. The instability secondary of this maneuvers is mainly preload dependant, so we propose the usage of a well known predictor of preload which is Pulse Pressure Variability (PPV) defined as the difference between systolic peak in inspiratory and expiration for predicting instability after RM.

**METHODS.** Prospective study where we include patients admitted to our critical care unit, 18 years older with the diagnosis of extrapulmonary sepsis and acute lung injury or ARDS secondary. All patients were monitored with an arterial line and hemodynamic stable before RM. We excluded patients with heart rhythm different of sinusal, and pneumonia patients. RM was given 40cm H2O CEPAP for 40 seconds in apnea. Before the RM, we determined PPV with variability >10mmHg, or without variability <10mmHg. Hemodynamic instability after maneuvers was defined when they present at least one of: systolic pressure <90mmHg, decrease >20mmHg of mean arterial pressure.

**RESULTS.** A total of 52 patients was included, two groups were made. Group A patients with hemodynamic instability after RM. Age mean 66.1 ± 15.6 and Group B with non hemorrhagic instability. Age mean 66.7 ± 16.4. no significants difference in age. APACHE II and length of stay. S02 at ICU admission were 89 ± 3 and 91 ± 3 (p = 0.03), cardiac indexes were 2.9 ± 1 L/min/m2 and 4.6 ± 2.1 L/min/m2 (p = 0.09), systemic vascular resistance index were 1504 ± 613 dyncm-5 and 1040 ± 654 dyncm-5 (p = 0.005), for Group A and B respectively. The PPV predict hemodynamic instability after RM with an 83.3% sensibility, 65.2% specificity, and with a Predictive Positive Value= 83.3% and Predictive Negative Value= 62.5%. Under the curve the 0.73.

**CONCLUSION.** The PPV is a useful, handy and cheap tool that can be used for predicting hemodynamic instability after RM, in order to take special precautions or avoid them.

**0459**

**SIGH ADMINISTRATION AT TWO DIFFERENT PRESSURE LEVELS DURING PSV: EFFECT ON GAS EXCHANGE**

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**INTRODUCTION.** Administration of periodic hyper-inflations (SIGH) during Pressure Support Ventilation (PSV), bears beneficial effects on gas exchange and respiratory mechanics. Purpose of this study was to investigate the effect of using different levels of pressure (PCAP) to administer SIGH. Moreover we tested if, once recruitment has been obtained by means of a large SIGH volume, the gas exchange seems to improve from baseline to SIGH.

**METHODS.** Six ALI patients undergoing PSV (PEEP=9±1.5, PS=7±5±4; FIO2: 0.48±0.16) were enrolled. After a baseline (no SIGHs for =10 minutes) data collection, the patients underwent four study periods, lasting one hour each: SIGHlow1 SIGHhigh SIGHlow2 Final. Baseline measurements was used and each parameter was compared to its baseline value. Moreover we tested if, once recruitment has been obtained by means of a large SIGH volume, the gas exchange seems to improve from baseline to SIGH.

**RESULTS.** A total of 52 patients was included, two groups were made. Group A patients with hemodynamic instability after RM. Age mean 66.1 ± 15.6 and Group B with non hemorrhagic instability. Age mean 66.7 ± 16.4. no significants difference in age. APACHE II and length of stay. S02 at ICU admission were 89 ± 3 and 91 ± 3 (p = 0.03), cardiac indexes were 2.9 ± 1 L/min/m2 and 4.6 ± 2.1 L/min/m2 (p = 0.09), systemic vascular resistance index were 1504 ± 613 dyncm-5 and 1040 ± 654 dyncm-5 (p = 0.005), for Group A and B respectively. The PPV predict hemodynamic instability after RM with an 83.3% sensibility, 65.2% specificity, and with a Predictive Positive Value= 83.3% and Predictive Negative Value= 62.5%. Under the curve the 0.73.

**CONCLUSION.** The PPV is a useful, handy and cheap tool that can be used for predicting hemodynamic instability after RM, in order to take special precautions or avoid them.

**0458**

**RESPECTIVE ROLE OF TIDAL VOLUME AND PEEP ON GLOBAL AND REGIONAL OPENING CLOSING IN ALI/ARDS**

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**INTRODUCTION.** Repeated opening and closing (O/C) of unatble alveoli in ALI/ARDS patients can induce ventilator induced lung injury. We analyze the role of both tidal volume (VT) and positive end-expiratory pressure (PEEP) in producing atelectrauma, assessed by CT-scan.

**METHODS.** Observational CT-scan study in ten patients with ALI/ARDS. Single CT slices were taken during inspiratory and expiratory pauses with VT 6 and 10 ml/kg at PEEP 10, 5, 15 and 20 cmH2O. Non-aterated tissue (NAT) was measured by Maluna18. Global O/C was calculated for each PEEP/VT combination as (NAT weight/Total weight at expiration)-(NAT weight/Total weight at inspiration). Regional O/C was evaluated splitting CT slices in ten compartments in the sterno-vertebral axis.

**RESULTS.** At VT 6, increasing PEEP levels decrease O/C, reaching significance at PEEP 20 (2.1±0.2% vs 6.1±5.5% at PEEP 5, p<0.03). At both PEEP 5 and 15, higher VT did not increase global O/C. Regional O/C at PEEP 5 and VT 6, increased from venial to middle levels (reaching 16.1±12.5% at level 7, p<0.04 vs level 1), and then decreased at posterior levels (Figure). Increasing PEEP up to 20, regional O/C decreased in middle zones (p<0.02 for level 6 vs PEEP 5). Increasing VT from 6 to 10, at PEEP 5, regional O/C persisted higher in CT middle zones and at PEEP 15, regional O/C decreased in middle zones, but significantly increased in dorsal zones.

**CONCLUSION.** Global O/C is higher at lower PEEP levels. Regional O/C at PEEP 5 is higher in middle CT zones and can be reversed at higher PEEP levels. High VT associated with PEEP 15 induced higher O/C at more dependent zones.

**0460**

**POSTER FORAMEN OVALE IN PATIENTS WITH ARDS**

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**INTRODUCTION.** Patent foramen ovale (PFO) may be responsible for hypoxemia via an intracar- diac right-to-left shunt. PFO is present at autopsy in more than 20% of the general population, but its incidence in patients with ARDS is unknown. PFO may be clinically significant in patients with ARDS because of favoring movement including mechanical ventilation, pulmonary hypertension, and high PEEP.

**METHODS.** We tested patients with ARDS for the presence of a PFO using collateral contrast trans-esophageal echocardiography. A PFO was diagnosed if more than three bubbles were visualized in the left atrium within three cardiac cycles from the time of complete opacification of the right atrium.

**RESULTS.** 36 patients were recruited and 10 (27%) were found to have a PFO. There was no statistical differences between patients with or without a PFO in terms of clinical or hemodynamic characteristics. Although PaO2/FiO2 ratio was similar between the two groups, PEEP level was significantly lower in patients with a PFO as compared to others: 6 [5-7] vs 10 [6-12] cm H2O, p<0.05. ICU duration and ICU mortality were comparable between the two groups.

**CONCLUSION.** PFO prevalence during ARDS is comparable to that found at autopsy (around 25%). A larger cohort is needed to elucidate its precise pathophysiologic and prognostic role in this setting.
0462
COMPARISON OF AERATED TO NONAERATED MEAN ALVEOLAR AREAS IN PIGLETS WITH INOCULATION PNEUMONIA
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INTRODUCTION. Loss of aeration in dependent lung was initially explained by lung collapse. However, in oleic-acid induced acute lung injury animals, the volume of the dependent lung was found unchanged suggesting that oedema and inflammation replace the gas and prevent alveolar collapse. The aim of the study was to compare the mean alveolar areas (MAA) of aerated (AA) and nonaerated alveoli (NAA) in piglets with inoculation pneumonia (IP) with MAA of normal piglets.

METHODS. Five healthy spontaneously breathing piglets and 8 piglets with IP were studied. Piglets with IP received Escherichia coli (106 cfu/ml) in their respiratory tract and were ventilated during 60 hours. Following sacrifice, lungs were fixed and six blocks were sampled from upper, middle and lower lobes. MAA of AA and NAA of dependent and nondependent regions were measured using specifically designed software. NAA was defined as >50% of alveolar lumen filled with polymorphonuclear leukocytes or oedema.

RESULTS. In inoculated piglets (PaO2/FiO2=163±57mmHg), 58% of secondary pulmonary lobules were filled with leukocytes and 13% of alveoli with oedema. MAA of AA was greater than MAA of NAA in inoculated piglets. MAA of NAA was smaller than MAA of healthy piglets. MAA was not different between dependent and nondependent regions.

CONCLUSION. In an animal model of IP characterized by a predominance of inflammation over oedema, a reduction of the size of nonaerated alveoli was observed, resulting in a marked reduction of the lung volume of infected lung regions.

REFERENCE(S). Hubmayr R D. AJRCCM 2004 165: 1647-53.

0464
EVALUATION OF ICU PATIENTS REQUIRING MECHANICAL VENTILATION
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INTRODUCTION. Acute Respiratory Failure (ARF) is a frequent cause of admission to ICUs and usually necessitates Mechanical Ventilation (MV). Knowledge about the incidence, mortality, and risk factors associated with patients that require MV is essential to improve outcomes. The objectives are determine the characteristics, risk factors prior and/or during MV, and general and specific mortality rates in patients under MV in a General University ICU, in southern Brazil.

METHODS. Prospective cohort of 523 adult patients admitted to the ICU who needed MV for at least 24 hours, between March/2004 and April/2005. Data were collected daily, for up to 28 days. Age, gender, APACHE II score, medical or surgical patients, causes for the requirement of MV, organ dysfunction/failure developed prior to MV and during MV, ventilatory parameters, duration of MV, modes of MV, tracheostomy and duration of weaning were some variables studied. Uni and multivariable analysis were performed.

RESULTS. The incidence of MV was 31%; the overall and specific mortality rates were 16% and 50%, respectively. The mean ±SD age was 57.4±18.3 years; 51% were males; the mean APACHE II was 22.6±8.1; medical patients was 70%, invasive mechanical ventilation was 93%. A multivariable analysis showed that age (p=0.008), MV duration (p=0.03), vasoactive drug use (p=0.011), Acute Lung Injury (ALI)/Acute Respiratory Distress Syndrome (ARDS) (p=0.001) and renal failure (p=0.007) occurring during the MV period, were independently associated to death.

CONCLUSION. The risk factors associated with mortality in 28 days (age, MV duration, vasoactive drug use, ALI/ARDS, and renal failure during MV) are similar to some literature studies. The overall and specific mortality rates were higher. Final conclusions will require evaluation of the mortality rates of specific pathologies, planned when our sample size will be increased. The identification of these factors may allow early interventions to improve therapeutic strategies. Others members of study: Costa, C D A G; Raymundi M; Bartz M; Gunelli A M; Schulte F; Benvegnu G.

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0465
PULMONARY AND EXTRAPULMONARY ARDS, UTILITY OF HUMAN RECOMBINANT ACTIVATED C PROTEIN
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INTRODUCTION. Clinical and radiologic differences between pulmonary and extra pulmonary ARDS are well known. Pulmonary ARDS has a worse prognosis, nevertheless mortality in both groups continues elevated. Anti-inflammatory strategies such as the use of human recombinant activated C protein (aCP) have demonstrated to reduce mortality in sepsis. The aim of this study was to evaluate the outcome in patients with ARDS with an infectious origin that received aCP and determine the difference between pulmonary origin and extra pulmonary ARDS.

METHODS. We included patients with ARDS with an infectious origin and divided them in two groups; pulmonary ARDS and extrapulmonary ARDS. Both groups received aCP at standard doses: 24 mcg/kg/hour for 96 hours. The following variables were analyzed: age, sex, severity of illness (APACHE II and SOFA), time of initiation of the aCP, respiratory evolution and mortality to discharge.

RESULTS. Twenty eight patients were analyzed. Table 1:

| Age (y) | 57±19.8 | 66±22 | p < 0.05 |
| APACHE II | 23±6±5.4 | 26±4±4 | NS |
| SOFA | 11±5±1 | 10±4±1 | NS |
| Pat02/Fio2 | 114±6±2 | 114±8±2 | NS |
| Time to initiate the infusion of aCP (h) | 14±6±2 | 27±4±3 | p < 0.05 |
| Ventilatory Support | 9±2±6 | 9±2±5 | NS |
| Mortality | 12±16 (66%) | 0±10 (0%) | p < 0.05 |

CONCLUSION. Mortality in ARDSpul did not change, however we demonstrate a better outcome in the extrapulmonary ARDS, related to the early treatment with aCP and to a younger population. The improvement in oxygenation (Pat02/Fio2) was earlier in extrapulmonary ARDS.

0463
ACUTE RESPIRATORY DISTRESS SYNDROME AFTER BRAIN TRAUMA: INCIDENCE AND EPIDEMIOLOGIC ASPECTS
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INTRODUCTION. Acute Respiratory Distress Syndrome (ARDS) is a highly lethal entity, composed by non-cardiogenic lung edema and a low pulmonary compliance. It is caused by local aggression or systemic inflammatory mediators. One of the most important causes is brain trauma, with or without associated multiple trauma. OBJECTIVE: To study incidence and epidemiology of ARDS in severe brain trauma patients admitted to an University Hospital in Brazil.

METHODS. Cohort study including all patients admitted in a 09 months period at the Adult ICU. It was used descriptive statistics, and analysis of variance (anova) with T-test.

RESULTS. In the studied period there were 38 patients admitted with severe brain trauma (10.4% of the total); 81.6% male. Median age and APACHE II: 30.0 and 17.5. The incidence of ARDS was 21.1%. Average length of mechanical ventilation (MV) before ARDS was 36.5 hours, and average MV total length was 13.5 days. Average Pat02/Fio2 at diagnosis was 100.1.

| TABLE 1. | BT + ARDS | BT without ARDS | p |
|----------|---------|----------------|---|
| n | 68 | 30 | |
| Age (y) | 28.7 | 34.0 | 0.385 |
| Male gender | 100.0% | 76.7% | 0.318 |
| APACHE II | 23.3 | 14.1 | 0.015 |
| ICU length (days) | 12.5 | 08.2 | 0.338 |
| Mortality | 62.5% | 26.7% | 0.09 |

CONCLUSION. In our study, in severe brain trauma patients ARDS revealed to be an usual complication, mainly in the most severe cases, with greater risk to increase morbidity, length of ICU and mortality.
**0466**

**EFFECTS OF INHALED RECOMBINANT ACTIVATED PROTEIN C (rHAPC) IN A PIG MODEL OF ARDS**

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**INTRODUCTION.** During ARDS lung inflammation is accompanied by a pro-coagulative and anti-fibrinolytic response. rHAPC has anti-coagulative, pro-fibrinolytic and anti-inflammatory effects: preliminary reports suggest that topical rHAPC improves oxygenation in ARDS models (1).

**METHODS.** In 12 pigs, ARDS was induced by intravenous LPS administration (100 mcg/Kg in 1 h). In six, randomly chosen, rHAPC (drotrecogin-alpha Ely-Lilly, USA) was continuously nebulized in the Airways at a rate of 48 mcg/kg/h (XG) form the beginning of LPS infusion. Lung CT scans, hemodynamics, gas exchange and respiratory mechanics parameters were obtained after 6 hours from LPS infusion. Normally aerated (-900 to -500 HU), poorly aerated (-500 to -100 HU) and non aerated (-100 to +100 HU) areas were measured in the largest traverse lung area.

**RESULTS.** Table 1

| TABLE 1. | Control | rHAPC |
|----------|---------|-------|
| Normally aerated areas (cm²) | 12 ± 8 | 38 ± 10 * |
| Poorly aerated areas (cm²) | 19 ± 3 | 10 ± 3 * |
| Non aerated areas (cm²) | 22 ± 7 | 5 ± 3 * |
| Ext. rat (C1/C2B0) | 0.9 ± 0.3 | 0.75 ± 0.12 * |
| PA/Pm | 46 ± 5 | 38 ± 2 * |
| PaO2/FiO2 | 227 ± 12 | 414 ± 88 * |

Data are mean +/- standard deviation, *p < 0.05 Control versus rHAPC

**CONCLUSION.** Topical treatment with nebulized rHAPC seems to minimize LPS-induced acute lung injury in a pig model of ARDS.

**REFERENCE(S).** 1 Waerhaug K et al. Inhaled aerosolized activated protein C improves gas exchange after endotoxin-induced lung injury. Abstract. Intensive Care Medicine, 2004, 134: S132.

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**0467**

**EFFECTS OF XIGRIS® ON PLASMA AND LUNG CYTOKINES CONCENTRATIONS IN OLEIC-INDUCED ACUTE LUNG INJURY**

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**INTRODUCTION.** We hypothesized that in acute lung injury (ALI) Xigris® was associated with a decrease in pro-inflammatory and an increase in anti-inflammatory cytokines.

**METHODS.** Sixteen piglets mechanically ventilated were randomly treated by either Xigris® (drotrecogin-alpha Ely-Lilly, USA) or placebo (PG) started 30 minutes (C1) before injecting 0.08 ml/kg oleic acid into the right atrium. IL1, IL2, IL6, IL8, IL12, TNFα, IL4, IL 10 and INFg were measured in plasma at C1, 110 minutes after oleic acid injection (C2) and 3 hours after C2 (C3). At the end of the experiment lungs were removed and bronchoalveolar lavage performed into the left lower lobe for assessment of the same molecules.

**RESULTS.** Cytokines had greater plasma values in XG (black bars) than in PG (white bars). The difference was significant for IL6 and IL8 at C2 only. In the lung, single statistical significance was observed for TNFα median (interquartile range) 65.6 (38.1-83.7) pg/ml in XG vs 26.1 (18.2-46.4) pg/ml in PG, respectively (p<0.05).

**CONCLUSION.** In conclusion, in present experiment, Xigris® was associated with greater values of pro-inflammatory cytokines in plasma and lung.

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**0468**

**HAS THE MORTALITY RATE FROM ALI/ARDS DECREASED OVER TIME?**

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**INTRODUCTION.** Some studies with historical cohort groups have suggested that mortality rates may have decreased in acute lung injury (ALI) and acute respiratory distress syndrome (ARDS). Other studies report continued high mortality rates. We performed a systematic analysis of the studies that report mortality in populations of patients with ALI and ARDS.

**METHODS.** We used the Medline database to select studies with the keywords “acute lung injury”, “acute respiratory distress syndrome”, “acute respiratory failure”, “mechanical ventilation”, limiting the search to adult patients and studies published in the English language. We also limited the search to studies using the criteria defined by the American European Consensus Conference (AEC). We excluded studies with less than 30 patients, and studies that considered only an etiologic subgroup of ARDS patients, such as sepsis-, trauma-, burns- or transfusion-related ARDS. In controlled intervention trials, we considered the mortality of the control group. To take into account the inevitable time delays in publication, we took the last year of patient enrolment as the year of the study. In addition, we separately analyzed studies with no exclusion criteria (primarily non-interventional) and trials with exclusion criteria (primarily interventional).

**RESULTS.** A total of 66 studies, published from January 1995 until October 2005, were included in the analysis. There was a wide variation in mortality rates among the studies, ranging from 20% to 72%. There was a trend towards a reduced mortality over the years (p=0.06). Analysis of interventional studies (with exclusion criteria) revealed a weak trend towards a reduction in mortality (p=0.24), while epidemiological studies (without exclusion criteria) showed an unchanged mortality rate over time.

**CONCLUSION.** There is a trend to reduced mortality over the last 10 years in studies of patients with ALI or ARDS but this is observed primarily in interventional (rather than in epidemiological) studies.

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**0469**

**EFFECT OF A2A ADENOSINE RECEPTOR ACTIVATION ON REPERFUSION LUNG INJURY**

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**INTRODUCTION.** In the clinical scenarios of lung transplantation, pulmonary thrombosis and cardiopulmonary bypass, lung injury secondary to ischemia and reperfusion (IR) is of serious concern. Adenosine receptors (AR) have been implicated in tissue protection and apoptosis regulation during IR injury. This study tests the hypothesis that reduction of reperfusion lung injury following A2A AR activation is associated with attenuation of apoptosis and alterations in anti- and pro-apoptotic protein expression.

**METHODS.** Using a specially designed triple lumen catheter, the arterial branch of the left lower lobe was occluded for 2hr and reperfused for 3hr after endotoxin-induced lung injury. Abs

**RESULTS.** Western blot analysis showed significant reduction in expression of Bcl-2 and increase in expression of Bax after reperfusion compared with control lungs. Apoptosis was preferentially increased in alveolar epithelial cells. Compared to the IR group, ATL313 markedly (P<0.01) attenuated indices of injury and apoptosis including the percentage of injured alveoli, wet/dry weight ratio, myeloperoxidase activity, TUNEL positive cells, and caspase 3 activity and expression. Furthermore, compared with reperfused lungs, in ATL313-reptreated lungs, Western blot analysis demonstrated increased expression of Bcl-2, and attenuated expression of Bax. The protective effects of ATL313 were blocked by pretreatment with ZM241385.

**CONCLUSION.** In vivo activation of A2A AR confers protection against reperfusion lung injury. This protection is associated with decreased apoptosis and involves alterations in anti-apoptotic Bcl-2 and pro-apoptotic Bax proteins. These results increase the understanding of the mechanisms by which adenosine A2A receptors modulate IR injury, and reinforce the potential for adenosine A2A agonists to be used as therapeutic agents to prevent or attenuate IR lung injury.

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SALBUTAMOL EFFECTS ON ALL EXHALED BREATH CONDENSATE BIOMARKERS

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INTRODUCTION. We have used biomarkers in exhaled breath condensate (EBC) to study the effects of salbutamol on lung inflammation in mechanically ventilated patients with ALI.

METHODS. EBC was collected (30–40 minutes at -20°C) Ecoscreen, Jaeger) before and 30 minutes after administration of inhaled salbutamol (80µg/kg). Immediately after collection and as soon as the sample returned to room temperature, we measured conductivity and pH before and after deaeration with helium (10 minutes). Nitrite (NO2) and nitrate (NO3) were measured. Samples were lyophilised and stored at -80°C. Lactokine β2 (LTB2) concentration was measured after sample reconstitution. Results are expressed as mean (SEM). We used SPSSwin with Wilcoxon and Spearman tests.

RESULTS. ALI Patients n=6 (4 M), age 59 (14) years. Before EBC collection: Lung Injury Score (LIS) 2.8 (0.4); PaO2/FiO2 ratio 146 (58) mmHg. Main results are presented below (table 1). No differences were found between baseline EBC values and controls. We found significantative correlations between: nitrates and PaCO2 (r= -0.84; p=0.03); nitrates and pH after deaeration (r= -0.9; p=0.03).

### TABLE 1

| Before salbutamol | After salbutamol | p value |
|-------------------|------------------|---------|
| pH before deaeration | 6.70 (0.17) | 6.77 (0.17) | 0.97 |
| Conductivity (µS) | 95.65 (43.26) | 163.05 (114.66) | 0.46 |
| LTB2 (µM) | 2.81 (1.39) | 2.04 (0.49) | 0.89 |
| NO2 (µM) | 11.01 (7.68) | 5.31 (2.80) | 0.13 |
| NO (µM) | 18.00 (6.29) | 15.54 (6.45) | 0.24 |

CONCLUSION. 1) EBC is a non-invasive technique that can be used to monitor ventilated patients.
2) In our small series, patients with ALI have no change in EBC compared with a normal population.
3) Inhaled salbutamol significantly increased the pH of EBC in patients with ALI but a direct effect of salbutamol inhalation cannot be discounted.

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PARTIAL LIQUID VENTILATION WITH SEMIFLUORINATED ALKANES IN EXPERIMENTAL LUNG INJURY

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INTRODUCTION. The feasibility of Partial Liquid ventilation (PLV) in Acute Lung Injury has been shown, however no beneficial effects compared to controlled mechanical ventilation (CMV) could be demonstrated. Semifluorinated Alkanes (SFA) may be advantageous in PLV because of their ability to act also as a carrier for different e.g. anti-inflammatory agents.

METHODS. In 21 anesthetised pigs (body weight 35.7 ± 3.6 kg) with saline lavage induced lung injury we compared CMV (CTRL, n=12) and partial liquid ventilation (PLV, n=9) with 30 ml/kg SFA (Model 1 – adjusted for sex, age, SAPSII, severity of sepsis, focus of infection, health care related infection, chemotherapy, chronic hepatic disease, haematological disease and severe sepsis and lactate model 2 – Adjusted for sex, age, diagnosis on admission, focus of infection, health care related infection, chemotherapy, chronic hepatic disease, haematological disease, cancer, respiratory, cardiovascular, renal, hepatic and haematological SOFA) for mortality analysis by logistic regression were built in order to find independent risk factors for 28 days mortality and we found SAPSII and severe sepsis in the first model, and age, chronic hepatic disease, cancer, cardiovascular and renal SOFA in the second model, to be independent risk factors for 28 days mortality.

CONCLUSION. This was the first national-wide study on CAS, documenting a high incidence in patients admitted to ICU, and thus an important public health problem.
0474
INTRAABDOMINAL SEPSIS PERSISTENCE. THE ROLE OF DYNAMIC SOFA PREDICTING A NEW RE-LAPAROTOMY.
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INTRODUCTION. Septic abdomen is an interesting challenge in general surgery: it is not easy to decide when and how to treat it, lacks of a general consensus and has not been standardized yet. Our aim is to identify whether the evaluable SOFA is a good predictor of the necessity of a new relaparotomy.

METHODS. Six years descriptive study, retrospective from 2000 to 2004 and prospective of 2005 of patients with intraabdominal sepsis admitted to our ICU. Patients with a course ≤2 days in Reanimation area were not included. Epidemiologic factors, reason for ICU admittance, the cause of intraperitoneal sepsis, severity scores, relaparotomy necessity, timing of interventions and evolution were collected.

RESULTS. 181 patients, mean age 61 (15) yr. APACHE-III, SAPS-II and SOFA at admittance were 82.4 (33.4); 47.76 (19.6) and 6.87 (3.73). In 123 cases (68%), the admittance cause was postoperative abdomen. The origin of peritonitis was colon and small bowel in 86 (47.5%) and 45 (25%) patients, because of an inflammatory process 55 (30.4%) or necrotic 51 (28.2%). Global mortality was 32.6%. Relaparotomy was required in 88 patients (49.5) 36.6% men. More than 2 reinterventions were required by 38%. Mean age was 61.7 (14.7) y. APACHE-III, SAPS-II and SOFA at admittance 81.4 (26.8); 45.17 (16.22); 7.06 (3.46) respectively. The cause of the first and second relaparotomy was anastomotic leakage 43 (49) and abscess 15 (17%) respectively. MV was required by 56 (64.6%) p during 15.5 (8.36-5) d. ICU length of stay was 17 (7.35-11) d and the mortality rate of this group was 33%. Time elapsing from elective surgery to the 1st relaparotomy was 7 (5-10), the 2d was 9 (6.75-12.25) and the 3rd was 4 (2.5-5.5) d. The main affected organs were cardiovascular and respiratory. SOFA during the first five days after admittance shows a decreasing tendency in the alive group (p>0.001) whereas in the dead group remains without change.

CONCLUSION. Postoperative SOFA follow-up of present intraabdominal sepsis after an elective surgery is not enough to predict the necessity of a new re-laparotomy. Global valuation of the patient is still the main aspect. SOFA at the first 5 days has a decreasing tendency in patients with satisfactory clinical course. The number of relaparotomies doesn’t imply a worse outcome.

0475
MORTALITY PROGNOSTIC FACTORS IN SEPTIC SHOCK.
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INTRODUCTION. Intravenous low doses of corticosteroids are recommended in patients with septic shock who require vasopressor therapy. The objective of this study is to determine the prognostic factors of mortality in patients with septic shock receiving low doses of hydrocortisone.

METHODS. Prospective study of patients admitted in ICU with septic shock since June 2005 to March 2006. All of them received vasopressor therapy and low doses of hydrocortisone after stimulation test with 1 and 250 mcg of corticotropin. Cha-squareanalysis was used to compare categorical data. Continuous data were used comparing Student’s t-test. Prognostic factors of mortality were studied by means of multivariable logistic regression analysis.

RESULTS. 68 patients were studied.63% were male. The average age was 58±17 yrs and 44% had previous chronic diseases. Severity scores: APACHE II 24±18, SOFA 11±3. Infection source was respiratory 47%; abdominal 23% and urinary 18%. Mean blood pressure was 54 mmHg. Baseline cortisol levels were 34±4±28 μg/dl (6.4-171), cortisol gradient postcorticotropic stimulation with 1 mg was 8±7.6 μg/dl (0-43) and after 250 mg 17.6±17.5 μg/dl (7-86). Serum lactate was 5.9±4.2 mmol/l. In 52% of the patients vasopressor therapy was discontinued within 48 hrs of the first dose of hydrocortisone and 86% at seventh day. Mean time to cessation of vasopressor agent was 48±9 hrs. Mean hospital stay was 26 days. Hospital mortality was 47% (ICU 32%). Diagnosis included sepsis, respiratory failure, severe sepsis, end stage liver disease and hereditary hemorrhagic telangiectasia. When we compare predictive power of ICU survival of CD14+HLADR+ expression, TNFa production of the whole blood after stimulation with LPS (TNFa) and IL-10 levels during ICU admission. Data are presented as median (Q25, Q75), Mann-Whitney U test and Chi² test were used when appropriate, p<0.05 considered significant.

CONCLUSION. One hundred and twenty patients (age 64 (53, 73), sex M/F 87/36, APACHE II 27 (20; 33) on admission. ICU stay 9 (5; 16) days) were enrolled between October 2004 – February 2006. On Day 1 survivors (S) (n=100) did not differ from nonsurvivors (NS) (n=20) in APACHE II (S=26 (19; 32) and NS=33 (24; 36); p=0.12), S and NS did not differ in CD14+HLADR+ 155 (47; 77) and 72 (56; 88), respectively; p=0.32. There was also no difference in frequency of immunoparalysis (defined as CD14+HLADR+<40% or TNFa production<100 pg/ml) in S and NS (n=65 in S and 33 in NS; p=0.08). On Day 5 data of 90 patients were available for analysis. There was no difference in S/NS in CD14+HLADR+. On the contrary NS were significantly more frequently classified as immunoparalysed according to TNFa production (NS = n=7 out of 25 and S = n=6 out of 65, Chi² test p<0.05) and IL-10 (NS = n=5 out of 11 and S = n=3 out of 42, chi² test p<0.001).

CONCLUSION. TNFa production of the whole blood after stimulation with LPS and IL-10 levels during ICU admission and early stay may better predict outcome than CD14+HLADR+.

REFERENCE(S). Dadak L, Storacova M, Stetka P, Slamková V (2005) Monocyte function (CD14+HLADR+) during first ICU days in long term ICU patients. Intensive Care Medicine 31, Suppl 1, S14.

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0476
PREDICTIVE ROLE OF VARIOUS PARAMETERS DETERMINING IMMUNOCOMPETENCE IN THE GENERAL ICU.
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INTRODUCTION. Our preliminary data suggested that on admission CD14+HLADR+ expression has low predictive value to ICU outcome (1). We tested if other parameters determining immunocompetence have better predictive value.

METHODS. Study was approved by local EC and waiver to informed consent was obtained. Patients who at D1 (D0 = admission) were estimated to stay in the ICU – >3 days were eligible. In this abstract we compare predictive power of ICU survival of CD14+HLADR+ expression, TNFa production of the whole blood after stimulation with LPS (TNFa) and IL-10 levels during ICU admission. Data are presented as median (Q25, Q75). Mann-Whitney U test and Chi² test were used when appropriate, p<0.05 considered significant.

RESULTS. One hundred and twenty patients (age 64 (53, 73), sex M/F 87/36, APACHE II 27 (20; 33) on admission. ICU stay 9 (5; 16) days) were enrolled between October 2004 – February 2006. On Day 1 survivors (S) (n=100) did not differ from nonsurvivors (NS) (n=20) in APACHE II (S=26 (19; 32) and NS=33 (24; 36); p=0.12), S and NS did not differ in CD14+HLADR+ 155 (47; 77) and 72 (56; 88), respectively; p=0.32. There was also no difference in frequency of immunoparalysis (defined as CD14+HLADR+<40% or TNFa production<100 pg/ml) in S and NS (n=65 in S and 33 in NS; p=0.08). On Day 5 data of 90 patients were available for analysis. There was no difference in S/NS in CD14+HLADR+. On the contrary NS were significantly more frequently classified as immunoparalysed according to TNFa production (NS = n=7 out of 25 and S = n=6 out of 65, Chi² test p<0.05) and IL-10 (NS = n=5 out of 11 and S = n=3 out of 42, chi² test p<0.001).

CONCLUSION. TNFa production of the whole blood after stimulation with LPS and IL-10 levels during ICU admission and early stay may better predict outcome than CD14+HLADR+.

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0478
PATHOGENS IN SEVERE SEPSIS: A TWO-YEAR ANALYSIS
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INTRODUCTION. Severe sepsis with accompanying multi-organ failure causes high mortality (28-50%) of critically ill patients in Intensive Care Units. The aim of the study was to analyse 133 cases of severe sepsis occurring in Regional Hospital in Poznan with a particular focus on microorganisms responsible.

METHODS. A retrospective study included 133 patients aged 19-79 with diagnosed severe sepsis. The seventy of sepsis was evaluated using the SOFA and TISS-28 score. Material for microbiological examinations was taken from lower respiratory tract, abdominal cavity, blood, central vein catheters, cerebrospinal fluid and urine. A microbiological analysis of isolated pathogens causing severe sepsis was then performed.

RESULTS. The respiratory system was the most frequent primary site of infection in the studied group (44%), while the second most common was the abdominal cavity (25%). Among pathogens isolated from patients, the dominant were Gram-negative bacteria (50%) and Gram-positive bacteria (45%). Both in the lower respiratory tract and in the abdominal cavity Gram-negative bacteria were recognized more frequently than the Gram- positive bacteria (63% vs 56% and 72% vs 27%, p=0.05). Occurrence of Gram-negative bacteria in the lower respiratory tract and the abdominal cavity were comparable. The most frequently isolated pathogens were: P. aeruginosa in the respiratory tract; E. coli in the abdominal cavity; MRBCNS in the blood. Multiresistant pathogens included MRBCNS (12%), MRSA (8%) and ESBL-producing Gram-negative rods (6%). Fungi accounted for 5% of all isolated pathogens. Pneumocystis carinii was found only in one patient. The mortality rate in the studied group was 40%.

CONCLUSION. In both the lower respiratory tract and in the abdominal cavity the dominant isolated pathogens were Gram-negative bacteria (P. aeruginosa, E. coli). MRBCNS was the most frequently isolated multiresistant pathogen.

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0480
HYPERGLYCEMIA IS ASSOCIATED WITH CRITICAL ILLNESS POLYNEUROMYO- PATHY
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INTRODUCTION. Critical illness polyneuromyopathy (CIPM) is a major clinical problem in the ICU, resulting in prolonged ICU stay and increased morbidity and mortality. The aim of the study is to investigate the relationship between hyperglycemia and CIPM development in the General ICU, as well as to investigate other risk factors involved.

METHODS. We prospectively evaluated 474 (329±151F; age 55±19) consecutive patients from August 2004 to September 2005 who were admitted in a General ICU and stayed for > 24 hours. All patients were assigned admission APACHE II (15±19) and SOFA (6±3) scores and were subsequently evaluated for newly developed neuromuscular weakness. We examined muscle strength according to the Medical Research Council scale, deep tendon reflexes, sensory function and muscle wasting. Lab values and medical therapy were recorded daily. Other potential causes of new-onset generalized weakness after ICU admission were excluded before the diagnosis of CIPM was established. Hyperglycemia was defined as glucose plasma levels > 110 mg/dL.

RESULTS. Fifty (11%) out of 474 patients developed generalized weakness that met the criteria for CIPM. Patients with CIPM had a higher admission APACHE II score (19±7 vs 14±7, p=0.001), SOFA score (8±3 vs 6±3, p=0.001) and a higher mortality rate (32% vs 19.6%, p=0.05). We found a statistically significant association of CIPM development with the duration of hyperglycemia (19±12 vs 12±11 days, p=0.001). Multivariable logistic regression analysis showed that risk factors independently associated with the development of CIPM were duration of hyperglycemia (serum albumin < 3 g/dl) and APACHE II score during admission at the ICU.

CONCLUSION. CIPM has a high incidence in the general ICU population. This prospective study supports an association between hyperglycemia and CIPM in the General ICU population. Our findings indicate the need for further investigation through a prospective randomized controlled study of the effect of strict blood glucose levels control on CIPM development in the General ICU.

0479
MORTALITY RISK FACTORS IN PATIENTS WITH INTRA-ABDOMINAL SEPSIS (IAS)
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INTRODUCTION. Intra-abdominal infections are an important cause of ICU morbidity and mortality. Recognized patients with risk factors associated to mortality after undergoing intra-abdominal sepsis makes possible premature interventions at ICU Aim: To determine factors that influence mortality in patients who are affected by IAS plus septic shock.

METHODS. We did a prospective observational research study and Thirty six critical ill patients admitted to the ICU. The effects of several risk factors on mortality on patients were evaluated. Investigated risk factors included age, Acute Physiology and Chronic Health Evaluation II (APACHE II) score, gender, Sequential Organ Failure Assessment (SOFA) score, weight, height, blood gases values; laboratory factors, type of peritonitis, alcohol use, shock on ICU admission, positive blood culture, diabetes, cancer, preoperative evidence of antibiotic use, type of antibiotic, bacteria found on the culture, and finally number of re-laparotomy. Statistics: a chi square test was performed to compare mortality. The SPSS 10 was used, and p<0.05 was significant.

RESULTS. Death was the outcome variable that was studied. 36.1% were male and 63.8% were female. Average age was 62.1±14.8 y. APACHE II score 16.3±5.3. 88.8% were secondary peritonitis. The mortality was 41.6%, and mortality for just secondary peritonitis was 33.3%. Escherichia coli were isolated on 41.6% and P. aeruginosa 5.5%. Klebsiella P. 5.5% on the group of patients with secondary peritonitis. Patients were empirically treated with Ceftriaxone 28.57%, Cefepime 28.57%, Imipenem 20% added to Metronidazole 74.1%. Statistics analysis showed that age, weight, WBC, neutrophils, SaO2, cancer, and MOF were significantly different on the group of death (Table 1).

TABLE 1. Mortality risk factors differences between groups

| Parameter | Death Yes | Death No | p       |
|-----------|-----------|----------|---------|
| Age       | 70.5±12.5 | 57.2±13.9| 0.009   |
| Weight    | 55.7±8.9  | 66.3±12.1| 0.015   |
| WBC       | 1431±664  | 9999±13±559| 0.045 |
| SaO2      | 96.6±2.37 | 94.1±3.32| 0.026   |
| Neutrophils| 90.9±3.83| 87.3±6.67| 0.002   |
| SOFA      | 77.8±22%  | 22.2%    | 0.001   |
| Cancer    | 71.4%     | 28.6%    | 0.021   |
| Out patients| 66.7%    | 33.3%    | 0.016   |

* (> 3) organ

CONCLUSION. Our results showed that PCR, BE and APACHE II score evaluated variable on admission were not risk of death. Results demonstrated a significant dominance of variables affected by immunomodulators in age, weight, cancer, neutrophils and MOF developed on ICU stay. Therefore, therapeutic effort should be focus on immune management (gamaglobulin, Glutamine, antioxidants, thyroid hormone, etc.) early on ICU stay in order to improve the prognosis of the patients. Besides of this, we should expand the analysis of surgical risk factors to mortality found on peri-operative variables in order to manipulate the surgical management and improve outcomes.

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0481
EXPRESSION OF MITOCHONDRIAL BIOGENESIS GENE MARKERS IN SEPSIS
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INTRODUCTION. Mitochondrial (mt) DNA is an important site of cellular damage in sepsis (1). Mt transcription factor a (Tfam), nuclear respiration factor (NRF-1), and peroxisome proliferator-activated receptor-gammaglucoactivator-alpha (PP/1-Alpha) are nuclear factors known to regulate mt DNA replication and energy-related gene expression and were shown to be up-regulated in septic animals (2). We present this data from an on-going clinical trial which examines the changes in mt biogenesis.

METHODS. With institutional ethical committee approval and appropriate consents, patients in septic shock and non-septic critically ill (CI) patients were recruited within 24 hours of ICU admission, control patients underwent elective hip surgery. Muscle biopsies were taken from the vastus lateralis muscle. Real-Time PCR was performed in triplicate after RNA extraction and reverse-transcription to cDNA using gene expression assays for human NRF-1, Tfam, and PGC-1alpha (18S was used as the internal control).

RESULTS. There was no significant difference comparing age and APACHE II scores between groups. There was a trend towards higher levels of all three mRNA markers for both, the septic and CI group compared to controls (table 1). This only reached statistical significance for PGC-1alpha in the CI group (*p<0.05 vs. control).

TABLE 1. Gene expression (mRNA) of nuclear factors, relative values

| Condition | NRF-1 (median, range) | PGC-1alpha (median, range) |
|-----------|-----------------------|----------------------------|
| Critically III (n=3) | 5.2 (3.1-5.3) | 3.2 (2.5-5.5) |
| Septic Shock (n=5) | 4.8 (2.8-3.8) | 2.8 (2.6-3.5) |

CONCLUSION. These preliminary data suggest that nuclear factors such as Tfam, NRF-1 and PGC-1alpha, responsible for mt biogenesis, are up-regulated in some patients with septic shock. Critical illness showed similar effects on gene expression. Our data provides evidence to confirm findings from animal experiments.

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SEPSIS CORRELATES WITH ADMA LEVELS WHICH MAY BE INFLUENCED BY A POLYMORPHISM IN THE DDAH II GENE

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INTRODUCTION. Asymmetrical dimethyl arginine (ADMA) is a naturally occurring protein metabolised by the enzyme dimethylaminohydrolase (DDAH). DDAH is a non-selective inhibitor of Nitric Oxide Synthase (NOS) and the co-localisation of DDAH and NOS at several sites supports the hypothesis that DDAH may regulate NOS activity by controlling the metabolism of ADMA. Elevated ADMA levels have been linked with greater severity of organ failure in patients with severe sepsis. Thus, NO depletion by ADMA may have biologic significance. Notably, the DDAH II gene maps to 6p21.3, a region of DNA that is particularly rich in genes involved in inflammatory responses. It has been hypothesised that its genetic location and wide expression in immune cells make it a candidate as a disease susceptibility gene in sepsis. This study was undertaken to assess the relationship between ADMA levels and severity of illness in patients with severe sepsis and also to assess the possible functionality of a polymorphism in the DDAH II gene.

METHODS. 47 consecutive patients admitted to the ICU with a diagnosis of severe sepsis and 10 healthy volunteers were enrolled. Serum ADMA was measured on day 1 and day 7 of ICU stay and once for each control. Allelic variation for a polymorphism at position –449 in the DDAH II gene was assessed in each patient.

RESULTS. On day 1 the ICU group showed greater ADMA levels than the control group (0.81 (0.57-1.09) vs 0.63 (0.57-0.71)), p=0.005). Levels increased during the first week in the ICU group to 1.05 (0.71-1.32)*, p=0.001. ADMA levels were associated with vasopressor requirements on day 1 (p=0.017) but not on day 7. ADMA levels and SOFA scores were associated on day 1 (R²=0.32, p=0.001) and day 7 (R²=0.002). A G allele at position –449 in the DDAH II gene was associated with increased ADMA production at both time points (p=0.05)* median with interquartile range in parenthesis, all units as μmol/L.

CONCLUSION. We have confirmed the association between ADMA levels and the extent of multiple organ failure in sepsis. We have also demonstrated that ADMA levels are upregulated in response to an infective insult and are also associated with hypotension in this setting. We propose that a polymorphism at position –449 in the DDAH II may be functional and has the potential to be used as a marker for the susceptibility to and severity of an inflammatory response secondary to an infective insult.

GENOTYPE-PHENOTYPE ANALYSIS FOR INTERLEUKIN-6 AND SOLUBLE ENDOTHELIAL PROTEIN C RECEPTOR IN SEVERE SEPTIC PATIENTS

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INTRODUCTION. Genetic polymorphisms in immune response genes have been demonstrated to be associated with clinical outcomes and have been identified as clinically relevant. The production of the proinflammatory cytokine interleukin 6 (IL-6) is partly due to genetic variations between septic individuals. IL-6 polymorphisms in the gene encode for the IL-6 receptor and are associated with clinical outcome. We therefore investigated whether susceptibility to and severity of sepsis in adult patients.

METHODS. Single nucleotide polymorphisms of the interleukin-6 gene (IL6-174*GC, IL6-572*GG, IL6-597*GA) and EPCR-polymorphisms (EPCR-4600*AG, EPCR-4678*CC) were identified in 78 severe septic patients with polymerase chain reaction (PCR) and subsequent melting curve analysis. IL6 and sEPCR plasma levels were measured on day 1 of severe sepsis in all patients by ELISA. IL6-597*GA was associated with increased IL6 plasma levels. Thereafter we used real-time RT-PCR to assess the relationship between ADMA levels and severity of illness in patients with severe sepsis and also to assess the possible functionality of a polymorphism in the DDAH II gene.

RESULTS. Preoperatively, gene expression of transcription factor SOCS3 and the pro-inflammatory cytokines remained unaltered after surgery, relative gene expression of proinflammatory cytokines including TNFa, IL1b and MIP1a, T-cell/Th1 associated KLF12, Perforin, CD3 and as well as hemoglobin (Hb) and MCHC associated CD74 was reduced in the sepsis group compared to controls (p < 0.05). Gene expression of the anti-inflammatory cytokine TGFb showed no differences between the groups, and IL-10 expression remained higher in the septic group (not significant). Using ROC-curve analysis, we found three genes of special interest for prediction of sepsis. The combination of Perforin, CD3 and TNFα (AUC: 0.81, 0.84, 0.86, respectively) was able to predict postoperative sepsis with a sensitivity of 75% and a specificity of 100% at the first day after surgery.

CONCLUSION. The significantly lower expression of inflammatory cytokines such as TNFa and IL1b leads to the conclusion that patients with postoperative sepsis suffered from a more pronounced immunodepression after surgery, even though the gene expression of anti-inflammatory cytokines remained unchanged. This emphasizes the influence of the postoperative immune status on the occurrence of complications. The presented pilot-study showed that gene expression based tests have the power to identify patients at risk before the occurrence of clinical symptoms.

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GENOTYPE-PHENOTYPE ANALYSIS FOR INTERLEUKIN-6 AND SOLUBLE ENDOTHELIAL PROTEIN C RECEPTOR IN SEVERE SEPTIC PATIENTS

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INTRODUCTION. Genetic polymorphisms in immune response genes have been demonstrated to be associated with clinical outcomes and have been identified as clinically relevant. The production of the proinflammatory cytokine interleukin 6 (IL-6) is partly due to genetic variations between septic individuals. IL-6 polymorphisms in the gene encode for the IL-6 receptor and are associated with clinical outcome. We therefore investigated whether susceptibility to and severity of sepsis in adult patients.

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C-reactive protein (CRP), an acute-phase protein, is a sensitive systemic marker.

METHODS. Prospective study in all the SIRS / septic patient admitted in the ICU. To determine the FPC levels, we used the IL testTM PC kit – Instrumentation Laboratory. We considered very low FPC when levels were below 40%, normal FPC when above 80% and low when between 40-80%. Demographics data collected included patient age, diagnosis, SAPS II at 24 hours, SOFA score, OSF and mortality. Analytical data included serum lactate and the functional protein C. Patients were divided into 3 groups according to the FPC levels: group I (patients with FPC below 40%), group II (patients with FPC 40 – 80%) and group III (patients FPC levels above 80%). Student test was used to evaluate the statistical significance (p<0.05). We correlate disease severity with the SAPSII score and lactate levels.

RESULTS. The study included 65 patients, 60% medical, 36.9% chirurgical and 3.1% were trauma patients. Two patients who were undergoing fibrinolytic therapy, were excluded. The results per group according the values of FPC were:

| Group   | Age | p | SAPSI | p | SOFA | p |
|---------|-----|---|-------|---|------|---|
| I       | 62±13.2 | NS | 50.7±22.3 | <0.05 | 9.3±2.7 | <0.05 |
| II      | 60±17.2 | NS | 39.4±17 | <0.05 | 6±5.3 | <0.05 |
| III     | 62±15 | NS | 30.8±15.4 | NS | 4±3.5 | NS |

CONCLUSION. We found a direct relation with statistical significance between the higher mortality rate, seriousness of the illness and Protein C values. Though the reduced patients enrolled in the study, this could means that the levels of Protein C disposable to be activated could be important as a prognostic factor in SIRS and septic patients.

0487
INCIDENCE OF VENTRICULOCESTOMY RELATED INFECTIONS VARIABILITY ACCCORDING TO THE DIAGNOSTIC CRITERIA
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INTRODUCTION. Ventriculitis is a serious complication of external ventricular duct drainage (EVD). Published series about ventriculostomy related infections (VRI) are highly variable in terms of definition of infection. Criteria proposed by Lozier et al, provide a precise description of VRIs, essential to identify clinically relevant infections.

METHODS. Prospective observational study (Jan 97-June 05) of all consecutive patients (pt.), admitted to our ICU, with acute non-traumatic intracranial haemorrhage who required an EVD. Criteria proposed by Lozier were used to define VRI: contamination, ventriculostomy colonization, suspected VRI (negative CSF cultures but chemistry and citoology strongly suggested a VRI); VRI and ventriculitis. Infection rates were calculated per 100 pt and per 1000 days of EVD.

RESULTS. A total of 250 pt. (114 males), mean age of 54 ± 15 y, APACHE II 16.3 ± 9.2 points, GCS 9.6 ± 4.2 required EVD:158 pt had subarachnoidal and 92 intraparenchmal haemorrhage (intraventricular haemorrhage was also present in 189 pt). A total of 359 EVD were inserted. The mean length of catheterization was 20.3 ± 16.3 days, and the total days with EVD were 5.075. In 84 (33.6%) pt, 98 VRIs episodes (ep.) were identified (70 pt. 1 ep, and 14 pt. 2 ep). The mean time of onset of ventricular infections was 11.9 ± 8.16 days. Rates of VRIs for the 5 groups in table 1.

| TABLE 1. | N episodes | Incidence rate n | SD n/100 pt | ID n/1000 days of EVD |
|-----------|------------|-----------------|-------------|----------------------|
| Contamination | 30 | 12% | 5.9%o |
| Ventricular colonization | 18 | 7.2% | 3.5%o |
| Suspected VRI | 25 | 10% | 4.9%o |
| VRI | 18 | 7.2% | 3.5%o |
| Ventriculitis | 7 | 2.8% | 1.3%o |

CONCLUSION. As it occurs with VAP or bacteraemia, rates of VRIs shows differences when calculated according to number of patients or use of devices. Incidence density has been defined for ventriculitis in non trauma patients. Following Lozier’s criteria, only half of episodes can be considered as real or probable infections.

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0490

USEFULNESS AND SAFETY OF OPEN TRACHEOSTOMY BY OBLIQUE APPROACH FOR CERVICAL INFECTION
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INTRODUCTION. The aim of this study is to clarify the usefulness and safety of open tracheostomy by oblique approach for cervical infection. In patients with cervical infection requiring open drainage and long ventilatory management, the site of tracheostomy is close to the drainage wound.

METHODS. The clinical course of 5 case after this technique were examined. The procedure of this technique is following; deciding the site of open wound drainage, making an 2.5cm of transverse incision for tracheostomy on the opposite site, dissecting the anterior neck muscles, inserting the tracheostomy tube through this oblique fistula (Figure).

RESULTS. There was no complication concerning the operative procedure (bleeding, desaturation, and displacement of the tube, etc.), post-operative complication, difficulty of daily management. All wounds of tracheostomy were kept separate from and not contaminated with the drainage wounds.

CONCLUSION. This technique is useful and safe for patients with severe cervical infection requiring open drainage and long ventilatory management.

0491

PROSPECTIVE STUDY OF NOSOCOMIAL INFECTION IN A MEDICAL ICU: A COMPARISON BETWEEN TWO PERIODS OF TIME
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INTRODUCTION. An important indicator of the quality in medical assistance is control of nosocomial infection (NI). Intensive Care Units (ICU) are areas with elevated NI rates. Many of these NI are associated with the use of external devices: mechanical ventilation, urinary catheters and central venous catheters. The aim of this study was to know the more relevant nosocomial infection rates in our ICU, the risk factors associated with nosocomial infection and trends in the infective flora in two periods of time: first period (A): from November 1994 to January 1995, and second period (B): May and June 2004.

METHODS. During three month in A and two month in B, the cumulative incidence, density of over-all incidence and device associated infection rates were determined, following the recommendations of the National Nosocomial Infection Surveillance System (NNIS) in the USA, in a total of 308 patients in A and 169 patients in B, admitted to the ICU.

RESULTS. The cumulative incidence was 8.4 infections per 100 admission in A and 19.5 in B (p<0.01). The density of overall incidence was 12.9 nosocomial infections per 1000 days of ICU stay in A and 23.98 in B (p<0.05). Device-associated infection rates were: 28.9 pneumonia per 1000 mechanical ventilation day in A and 36.6 in B (p<0.05); among urinary tract infections, respectively 5.3 and 8.7 per 1000 days of catheter use (p<0.05); 0.4 bacteremia per 1000 days of central venous catheter use in A and 10.6 in B (p<0.04). In both periods, pneumonia was the more common nosocomial infection, followed by urinary tract infection. Pseudomonas aeruginosa was the microorganism recovered most frequently in A and Acinetobacter spp in B. The most common used antibiotics where third generation cephalosporins, quinolones and macrolides in A. In B, sulfameth-ampicillin and amikacin.

CONCLUSION. 1) In the last ten years, we are seeing an increasing tendency in the rates of infection incidence; that is significant in the associated to the use of central venous catheters infection. 2) This nosocomial infection surveillance study has allowed us to know which are the microorganisms recovered most frequently in our ICU and to do an appropriate empirical antibiotic therapy. 3) The use of NNIS rates is advisable because it allows to know the impact of NI in our unit, to perform comparative studies between periods of time and to perform comparative studies with other units of similar characteristics.

0492

ETIOLOGY, RISK FACTORS AND OUTCOME OF URINOINFECTION
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INTRODUCTION. Urinoinfections occurs at the highest rate (40%) among all hospital infections of Intensive Care Unit (ICU) in U.S.A. Both in Europe and Lithuania data differs-urinoinfection occurs in 17.6% cases of hospital infections following the highest rate of those of respiratory origin. 80% of urinoinfections related with catheterization urinary bladder.

METHODS. Retrospective study of ICU patients (pts) with positive urinary culture with or without clinical symptoms of unrinoinfection. Data were statistically analysed by program SPSS12. Risk of urinoinfection and lethal issue was evaluated by models of logistic regression.

RESULTS. The growth of microorganisms (m/o) was determined in urine of 82 (3.9%) pts: urinoinfection in 64 (78%) and colonization in 18 (22%)pts. Among pathogens of urinoinfection rods predominated significantly (p<0.05). E.coli in urinoinfection was obtained exclusively in cases of urinoinfection. All patients with positive urinary culture had catheterized urinary bladder (p<0.05). In cases of the same sex, age and underlying disease of the pts, the risk of urinoinfection with every day of catheterization was significantly increased in 21.7% (p<0.05). Among pathogens of lethal outcome there was estimated significant predomination of rods (p<0.05). In cases of the same sex, age, underlying disease and duration of catheterization, the development of urinoinfection significantly increased the risk of lethal outcome in 5.5 times (p<0.05).

CONCLUSION. Positive urinary culture was found in 3.9% of pts, three quarters of them were due to urinoinfection. Rods were domonative pathogens in urinoinfection. E.coli in urinoinfection always resulted in urinoinfection. Catheterization of urinary bladder resulted in urinoinfection or colonization. Each day of urinary bladder catheterization increased the risk of development of urinoinfection in 21.7%. Rods in urinary culture were associated with lethal issue. Development of urinoinfection increased the risk of lethal outcome in 5.5 times.

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0493

OUTCOME AND PREDICTORS OF MORTALITY IN CRITICALLY ILL PATIENTS WITH HEMATOLOGICAL MALIGNANCIES
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INTRODUCTION. The mortality rates of patients with a haematological malignancies admitted to an Intensive Care unit remains unacceptable high. The aims of this study were to assess the outcome of patients with hematological malignancies (HM) admitted to an intensive care unit (ICU) and to identify prognostic factors that may affect patients' outcome.

METHODS. Retrospective chart review of haematological patients admitted to a 16-bed intensive care unit (ICU) of a tertiary level academic teaching hospital from 2000 to 2005. Clinical variables and ICU mortality were collected. A multivariate analysis was performed to define the risk factors associated to ICU-mortality in patients with a haematological malignancy using SPSS package (13.0).

RESULTS. Sixty patients with HM admitted in ICU were reviewed. The age of these patients was 58±16.3 and their mean APACHE II and SOFA scores were 20.7±6.7 and 9.1±4.5 respectively. Pa-tient main diagnoses were leukaemia (35%), lymphoma (33.3%) and mieloma (18.3%). In forty eight episodes an episode was present at admission. The crude ICU mortality were 58.3%. Recent diagnosis of HM, prior use of chemotherapy, need of Mechanical ventilation, respiratory foci of infection, presence of mutilorgan failure, APACHE II and SOFA score at admission, need of vasoactive drugs and urea blood levels were significantly higher in non-survivors group in the univariate analysis. Logistic regression confirmed only the recent diagnosis of HM and the need of mechanical ventilation as independent predictors of ICU mortality in patients with HM admitted to ICU.

CONCLUSION. Nowadays mortality rates of ICU admitted HM patients remains excessively high. Recent diagnosis and the need of Mechanical ventilation must be considered as a predictors of global ICU mortality in these patients.
0494 INADEQUACY OF EMPIRICAL ANTIBIOTIC THERAPY IS ASSOCIATED TO AN INCREASED MORTALITY IN A GENERAL ICU.

INTRODUCTION. Infections are prevalent in ICU and are an important factor associated to unfavorable outcome. The choice of empirical antibiotic therapy is becoming more and more difficult due to the resistance of organisms. However, a wrong choice seems to be associated to a worst prognosis. We aim to evaluate the adequacy of empirical antibiotic therapy and to describe the main microorganisms in a university general ICU (24 beds).

METHODS. 210 patients were prospectively observed for adequacy of empirical antibiotic therapy. Therapy was considered inadequate whenever the identified microorganism was not covered by the antibiotic (resistance or absence of an active drug).

RESULTS. Lung was the most common site of infection (50%). Empirical antibiotic therapy was inadequate in 35% of the treatments. The main microorganisms associated to inadequate therapy were: Staphylococcus MRSA, multi-resistant Pseudomonas and Stenotrophomonas maltophilia. Mortality rate was higher among patients inadequately treated (54% vs. 30%, OR=3.45, p<0.05). Nosocomial infection (RR 2.07, IC95% 1.01-4.26) and 24 h retard in starting antibiotics (RR 2.15, IC95% 1.15-5.08) were the main factors related to inadequate therapy. We observed a great variability of antibiotic schemes (n=22) mainly among nosocomial infections.

CONCLUSION. An inadequate antibiotic therapy is associated to a greater mortality. We believe that both a retard in starting treatment and the great variability in empirical treatments contributed to the greater mortality.

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0496 NECROTIZING FASCITIS: A DECADE OF SURGICAL INTENSIVE CARE EXPERIENCE

INTRODUCTION. Necrotizing fascitis is a rare disease, potentially limb and life threatening infection of fascia, subcutaneous tissue with occasionally muscular involvement. Necrotizing fascitis is surgical emergency with high morbidity and mortality.

METHODS. Patients and methods: The medical records of necrotizing fascitis patients treated in surgical intensive care unit (SICU) of our hospital from Jan 1995 to Feb 2005 were reviewed retrospectively.

RESULTS. Ninety-four patients with necrotizing fascitis were treated in surgical intensive care unit during the review period. Necrotizing fascitis accounted for 1.15% of total admissions to our SICU. Mean age of our patients was 48.6 years, 75.5% of the case were male. Diabetes mellitus was most common comorbid disease (56.4%), 24.5% patients had hypertension, 14.9% patients had coronary artery disease, 9.6% had renal disease, 6.4% cases were obese. History of operation (11.7%) was most common predisposing factor in our patients. All patients had leucocytosis at admission to the hospital. Mean duration of symptoms was 3.4 days. Mean number of surgical debridement was 2.1, mean SOFA score at admission to SICU was 8.65. 36.3% cases were type I necrotizing fascitis were as 43.6% had type II infection. Streptococci were most common bacteria isolated (52.1%), commonest organ of the body affected by necrotizing fascitis was leg and foot. Mean intubated days and ICU stay were 4.8 and 7.6 days respectively. Mean fluid, blood, fresh frozen plasma and platelets concentrate received in first 24 hours were 4.8 liters, 2.0 units, 3.9 units and 1.6 units respectively. Common complication was ventricular tachycardia (6.4%). 46.8% patients had multi organ dysfunction, 15 of them died giving mortality of 16% in this study.

CONCLUSION. Necrotizing fascitis more common in male. Diabetes mellitus was the most common comorbid disease, type I necrotizing fascitis more common and commonest organ of body affected by necrotizing fascitis was leg and foot.

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0497 LUNG PENETRATION OF AMPHOTERICIN B LIPID FORMULATIONS

INTRODUCTION. Amphotericin B (AmB) is a potent polyene antifungal drug for intravenous treatment of invasive infections of the lung. It is used as AmB-dexytocholate and in order to reduce AmB toxicity as lipid formulations of AmB: Iposomal AmB (LAMB, Ambisome®), Amb colloidal dispersions (ABCD, Amphocil®) and AmB lipid complex (ALBC, Abelcet®). These three therapeutically used preparations display remarkable differences in their plasma pharmacokinetics.

METHODS. AmB levels of twenty-two critically ill mechanically ventilated patients, who were on treatment with lipid formulated AmB, were measured in bronchoalveolar lavage specimens obtained from routine diagnostic bronchoscopy. Five patients were on LAMB, twelve on ABCD, five on ABLC. The volume of epithelial lining fluid (ELF) recovered was calculated by the urea dilution method. The concentrations in epithelial lining fluid were compared with simultaneous levels in plasma to determine the penetration into the lung. BAL samples were purified by solid phase extraction (SPE). AmB was measured by a high-pressure liquid chromatography (HPLC) technique.

RESULTS. Concentrations (means ± standard deviations) in plasma and ELF of LAMB treated patients were 4.5 ± 3.33 µg/ml and 2.22 ± 2.26 µg/ml; of ABCD treated patients 1.57 ± 1.42 µg/ml and 0.35 ± 0.27 µg/ml and in the ABLC group 0.43 ± 0.34 µg/ml and 2.08 ± 2.14 µg/ml, respectively. By LAMB treatment the highest concentrations of total AmB in ELF were reached. The difference in the concentration of AMB in ELF between LAMB and ABCD was significant (p=0.045). The mean concentration of ELF exceed those obtained in plasma only in the ABLC group. Mean AmB penetration into ELF (ELFC/Plasma x 100 [%]) amounted 65% in the LAMB group, 89% in the ABCD group and 647% in the ABLC group with a significant difference between ABLC and ABCD (p=0.023). Cumulative dose were comparable in all three groups, whereas the interval between administration and BAL differed, but no significance was evident: LAMB 2.455mg 3.5h; ABCD 2.055mg 11.2h; ABLC 2.620mg 7.1h.

CONCLUSION. The concentration of AmB in ELF is influenced by the administered lipid formulation. Penetration into ELF appears to be different from the penetration into lung tissue samples obtained from autopsy, which suggests that accumulation of the lipid-formulated drugs is dependent on the compartment.

Grant acknowledgement. We thank Torex Chiesi, Vienna, Austria.

REFERENCE(S). American Thoracic Society. Guidelines for the management of adults with hospital-acquired, ventilator-associated, and healthcare-associated pneumonia. Am J Respir Crit Care Med 2005; 171:388–416.
INTRODUCTION. Septic and septic shock are the major causes of mortality in ICU. The target- site concentration of antibiotics in patients in septic shock, such as betalactams and carbapenems 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 intraperitoneal concentration of the meropenem in patients with severe peritonitis, Mannheim Peritonitis Index (MPI) > 19, and septic shock. Aim of the study was to evaluate the concentration of meropenem in the peritoneal cavity, close to causative lesion, eg perforation of colon.

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. The cause of sepsis was severe peritonitis, MPI > 19. Patients were 5 male and one female, average age 65.7 years and range 52-81 years. All patients received meropenem (Meropenem, Antro-Zeneva) as the first choice of empirical antibacterial therapy. Microdialysis catheters (gastrointestinal CMA 62 catheters with 20 kDa cut-off 30 mm long membrane) were placed into the peritoneal space during the operation. CMA 107 microdialysis pump was used with the perfusion rate of 1 ml/min. Retrodialysis method was used to determine recovery of the meropenem. Meropenem 1 g was given by intravenous infusion over 20 min. The microdialysis and blood samples were taken according to predetermined schedule during the 7 hours. Blood samples were taken between of the microdialysis samplings.

RESULTS. Mean plasma and intraperitoneal peak-concentrations of meropenem were 86.13 mg/l +/- 20.67 and 36.83 +/- 20.45 mg/l, respectively. The peak concentrations were achieved at 18.33 min in plasma and 74.17 min intraperitoneally. E. coli and B. fragilis are known as main causative agents for peritonitis. Therefore we use a T > MIC as surrogate marker of efficiency. Intraperitoneal concentration of meropenem persisted higher than MIC during study time between two consecutive administrations of meropenem. Plasma half-life, volume of distribution and clearance were 233.67 min, 23.5 l and 97.7.

CONCLUSION. Meropenem penetration to peritoneal cavity is excellent and achieved concentration is sufficient for killing of potential causative bacteria.

INTRODUCTION. Oral linezolid has been shown to provide a high rate of success against resistant Gram-positive bacteria in previous studies. In this study, we evaluated the use of oral linezolid in the treatment of resistant Gram-positive heart valve endocarditis.

METHODS. Inclusion criteria were: 1. Patients with prosthetic single or double valve endocarditis 2. Resistant Gram-positive bacteria, as defined by in vitro susceptibility testing. Exclusion criteria were: 1. Patients with contraindications to the use of linezolid 2. Patients with severe renal impairment (creatinine clearance < 30 ml/min) 3. Patients with severe hepatic impairment 4. Patients with severe drug allergies 5. Patients with documented fungal or mycobacterial infections 6. Patients with uncontrolled diabetes mellitus.

RESULTS. A total of 21 patients were included in the study. The median age was 74 years (range 18-90). The majority of patients were in NYHA class I (7/10) and II (3/10). The most common underlying cardiac disease was mitral valve disease (8 patients). The most common causative organism was Staphylococcus aureus (10 patients). The median duration of therapy was 28 days (range 14-56 days). Overall, the success rate was 95% (20/21 patients). There were no serious adverse events reported.

CONCLUSION. Oral linezolid is an effective and well-tolerated treatment option for resistant Gram-positive heart valve endocarditis. Further studies are needed to evaluate its long-term efficacy and safety.

INTRODUCTION. The combination of urgent heart valve replacement and the sequential antibiotic approach has been shown to be effective in the treatment of heart valve endocarditis. However, the optimal timing of antibiotics before and after valve replacement remains unclear.

METHODS. We performed a retrospective analysis of 21 patients who underwent urgent heart valve replacement for severe heart valve endocarditis at our institution. The median age of patients was 65 years (range 20-85 years). The most common causative organism was Staphylococcus aureus (10 patients). All patients received a sequential antibiotic approach consisting of at least 48 hours of intravenous antibiotics followed by 2-4 weeks of oral antibiotics.

RESULTS. The median hospital stay was 23 days (range 7-45 days). The median duration of antibiotics was 28 days (range 14-56 days). The success rate was 95% (20/21 patients). There were no early or late deaths. The most common adverse event was atrial fibrillation (10 patients).

CONCLUSION. The sequential antibiotic approach is a safe and effective treatment option for severe heart valve endocarditis. Further studies are needed to determine the optimal duration of antibiotics before and after valve replacement.

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0502
PREVALENCE OF UNPREDICTED INTERRUPTIONS IN ENTERAL NUTRITION THERAPY OF SERIOUSLY ILL PATIENTS
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INTRODUCTION. The enteral nutrition therapy (ENT) is important part in the treatment of the patients in the Intensive Care Unit (ICU). Early and aggressive nutritional support can aid in the reduction of complications and reduce the inpatient time. However, some factors limit the full administration of enteral nutrition to these patients. Objective: To identify factors that interfere with average time for attainment of basal energy expenditure (BEE) in enteral nutritional support of seriously ill patients and to raise hypotheses of possible consequences.

METHODS. This was a retrospective observational study with 140 patients admitted in ICU and remained in nutritional therapy (at least five days) in 2005.

RESULTS. In 140 patients 62.85% were women and 37.15% men. The average age was 71.02 years. We have 55.76% patients with interruptions in the ENT (180 interruptions in the total). Amongst the reasons most prevalent to the interruptions had been identified: examinations and clinical procedures in 45 cases (27.7%) of the interruptions), abdominal distension = 18 (11%), vomiting = 22 (13.5%), surgery = 11 (6.79%) and mal adjusted of enteral catheter in 41 cases (25.3%). Analyzing the average time for attainment of the BEE referenced by literature in 4 days, 24 patients (17.14%) not reached this goal, 79% caused by interruptions of diet infusion. Average time to reach BEE was 3.13 ± 2.19 days.

CONCLUSION. The analysis of this study shows the high incidence of interruptions in the ENT of seriously ill patients, without consequences in the average time to achieve the BEE (average time for attainment BEE was 3.13 days). The adoption and maintenance of nutrition protocols to detect and to minimize the involved factors of inadequate administration of ENT are fundamental activities in an ICU, mainly related to the maladjusted of enteric catheters and accomplishment of clinical procedures.

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0504
FOOD ACCELERATION INFLUENCE ON LEPTIN VALUE IN PRETERM NEONATES
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INTRODUCTION. Leptin is a hormone excreted from adipose tissue and bound to hypothalamus. Leptin is implicated in appetite control, temperature up-regulation and energy expenditure. Our study’s aim was to determine the impact of feeding on leptin secretion in a population of preterm neonates.

METHODS. Leptin study was a prospective one, enrolling 87 preterms born at the hospital. Ethics Committee approval and parental informed consent were obtained. Eligible neonates were all preterms (<37 weeks of gestation, according to Dubowitz criteria). All neonates were fed within 4-6 hours after birth the same volume according to weight and day. For example on day 1 they received 30 ml/kg with an increment of 30 ml/kg/per day till maximum 250 ml/kg/per day. Neonates were fed the same formula and breast fed infants were excluded as well as those with respiratory distress, birth injury, vomiting, diarrhoea, necrotising enterocolitis. Blood sampling during the first 6 hours of life and repeated sampling on day 26 of feeding for serial leptin measurements.

RESULTS. 87 neonates mean gestational age 34.13 (SD: 1.04), mean birth weight 2047.73 gr (SD: 510 to 2904 gr). Mean leptin value on day 1 was 2.44 pmol (SD: 5.845), and on day 16 mean leptin value was 1.477 pmol (SD: 1.240). T-test for paired samples gave statistic difference in 95% confidence interval with (2-tail sig-nificance: 0.029) on leptin value between day 1 and 16.

CONCLUSION. Leptin is greatly influenced by food augmentation in preterm infants.

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Grant acknowledgement. Endocrinology Department 'Agios Panteleimon' Hospital, Nikaia, Greece.

0503
THE METABOLIC AND RESPIRATORY COST OF AGITATION
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INTRODUCTION. Agitation is a frequent finding in ICU patients. Situations, as opioid or benzodi-azepine withdrawal syndrome and brain trauma may induce central sympathetic overactivity and agi-tation after sedation interruption. The metabolic and respiratory consequences of agitation may have serious therapeutic implications.

METHODS. Seventeen ICU patients (14 males and 3 females) with an age of 32±12 years (mean ± SD), presenting agitation after sedation interruption were studied by indirect calorimetry. Measure-ments were performed before and after sedation interruption, during weaning from mechanical ventilation under Pressure Support Mechanical Ventilation. The following metabolic and respiratory parameters were measured: Tidal Volume (Vt), Respiratory Rate (RR), Minute Ventilation (VE), O2 Consumption (VO2), CO2 Production (VCO2), Resting Energy Expenditure (REE), and Resting En-ergy Expenditure as a percentage of predicted, according to the Harris and Benedict equation. Paired t-test was used for statistical analysis.

RESULTS. The effect of agitation on the respiratory parameters Vt, RR, VE increased an increase from 708 ± 160 to 768 ± 157ml, from 12 ± 3 to 24 ± 8 breaths/min and from 9±6 to 16±5 liters/min, re- spectively (p<0.01). Concerning the metabolic parameters, agitation induced a tremendous increase in VO2, VCO2, and RRI (from 270±73 to 404±160 ml O2/min from 231±65 to 382±165 ml CO2/min and 1903±510 to 2904±1177 kcal/day respectively (p<0.001)). REE, compared to RRI predicted was increased from 104% to 160%, (p<0.01). Respiratory Quotient (RQ) remained constant.

CONCLUSION. Agitation induces a tremendous increase in the metabolic demands, thus increasing the ventilatory demands in order to balance the O2 consumption and CO2 production. This may be detrimental for patients with limited respiratory reserve.

0505
ASSURING THE QUALITY OF NUTRITION FOR THE INTENSIVE CARE PATIENT – A CONTINUOUS PROCESS
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INTRODUCTION. The intensive care unit (ICU) at Stavanger University Hospital in Norway has carried out a quality improvement project on nutrition for the intensive care patient (ICP), involving development of guidelines for escalation (algorithm) for enteral nutrition, training of nurses and doc-tors as well as courses and tuition. The purpose was to describe existing nutrition practices in selected registration periods in order to measure the effects of the project in the short as well as the long term.

METHODS. The project has utilized the principles of the “penetration method”. Measurement instru-ment: Registration of nutrition practices before and after implementation of the new standard (phase 1 and 2), repeated after 21/2 years (phase 3). Included: All adult ICP who spent more than two days in the ICU.

RESULTS. Phase 1-1) ICP on average received 45% of their calorie needs. 2) Administering of enteral nutrition (EE) started after 5-2 days. 3) 33% (4) received parenteral nutrition (PE), 25% (3) received EE and 17% (2) received a combination of PE and EE. 25% (3) received “free liquids”. 4) 4% (3) of ICP on average received 86% of their calorie needs. 2) Administering of EE started after 2.8 days. 3) 11% (3) received PE, 35% (5) received EE and 54% (8) received a combination of PE and EE. 4) 34% (49/144) of ICP on average received 48% of their calorie needs. 2) Administering of EE started after 2.8 days. 3) 11% (3) received PE, 42% (12) received EE and 7% (2) received a combination of EE and PE. 36% (10) received “free liquids”. 4) 52% (76/147) of ICP on average received 50% of the daily nutrition targets.

CONCLUSION. The project has improved both the focus on and quality of clinical nutrition at our ICU. Not unexpectedly, the effects were greater in the short term than in the long term. The main effects in the short term were that the calorie intake by the ICP increased by 41%. The use of EE and PE in combination to satisfy the nutritional requirements of the patients also increased. In addition to improved documentation, earlier and increased use of EE is the primary long term effect. The calo-rie needs of the ICP are still not adequately covered. This show that the ICP still are suffering from malnutrition. This presents both challenges and improvement potential. Main challenges: 1) Adequate nutrition supply. More combination of EE and PE should be considered in order to meet the needs of the patient. 2) Achieving optimum start of administering (within the first 24-48 hours) and more exten-sive use of EE. 3) Maintaining focus on and interest for clinical nutrition in the ICU. 4) Regard quality improvement of nutrition for the ICP as a continous process.

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0506 IMPACT OF SYNBIOTICS ON MONOCYTE FUNCTION IN LONG TERM ICU PATIENTS

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INTRODUCTION. To evaluate impact of synbiotics on enteral feeding tolerance and immune function in long term ICU patients.

METHODS. The study was approved by institutional ethical committee. Patients estimated on D1 (D0 = admission) to stay in the ICU > 3 days were randomized. Placebo group (Placebo) received daily tea, treatment group (Synbiotic) Synbiotic 2000 Forte (Medipharm AB, Sweden) until D21. In both groups the enteral nutritional (EN) was administered post pylorus acc. to standard ICU protocol. Monocyte function was monitored on D1 and subsequently every 5 days. Daily amount of enteral nutrition and number of stools were recorded. In this abstract preliminary analysis of early development (D1 - D5 - D10) of CD14+HLADR+ expression and tolerance of enteral feeding is reported. Data are presented as median (Q25; Q75), nonparametric tests were used.

RESULTS. Twelve patients (10 male; age 54.39 (63)) were randomized (Synbiotic N=7, Placebo N=5). Eleven patients survived ICU stay (5), 1 died (NS). Mostly surgical patients (N=11) were included. 7 primary admission, 5 secondary admission. APACHE II on admission was 22 (21; 27). There was no significant difference in CD14+HLADR+ on Day 1 (Synbiotic 42 (30; 59) vs. Placebo 54 (33; 66)). An improvement of CD14+HLADR+ in Synbiotic group was observed during ICU stay (p=0.02) but not in Placebo. On D10 CD14+HLADR+ in both groups was 73 (64; 81) Synbiotic and 52.5 (50; 61) in Placebo. One hundred and two days of enteral nutrition in Synbiotic group vs. 60 days in Placebo group was compared. Daily amount of enteral nutrition was higher in Synbiotic group (905 ± 1240) mlday vs. Placebo-group 720 (455; 960) mlday, p=0.05. Number of stools was higher in Synbiotic group (5 stools/102 days) than in Placebo group (27 stools/60days) during the treatment. Number of days of enteral nutrition intolerance was very low (Synbiotic 2/102 vs. Placebo 1/60 days).

CONCLUSION. Preliminary data show that Synbiotic 2000 Forte (Medipharm AB, Sweden) can improve monocyte function and amount of enteral nutrition in ICU patients.

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0508 ENTERAL DIET IN CHRONIC OBSTRUCTIVE PULMONARY DISEASE UNDER MECHANICAL VENTILATION

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INTRODUCTION. Loss of weight is associated with malnutrition as a consequence of total or partial fasting situations that caused a catabolic state in the patient. The aims of the nutritional therapy in patients with mechanical ventilation (MV) are: to give the necessary energy support, to reduce the ventilatory muscle compromise, to avoid overproduction of CO2 and reverse the nutritional disturbance caused by insufficient respiratory.

METHODS. Retrospective study. We analyzed 114 patient’s files with the diagnostic of COPD with MV, receiving enteral nutrition for at least 96 hours, divided in two groups: Group 1 with high carbohydrates diet and group 2 with low carbohydrate diet. We compared age, gender, length of stay and ventilation days. Delta of: prealbumin, transferrin, total lymphocytes, urinary nitrogen excretion at the beginning or during the first 24 hours and after 96 hours. We used t-student and X2.

RESULTS. Fifty one had EPOC and an underlying disease requiring MV. The mean age was 64.5 ± 9.9 years (41-82), 65% (33) were male and 35% (18) female. The mean length of stay was 13.2 ± 4.2 days (7-35), the ventilation were 7.5 ± 2.3 days (4-18). The admission diagnosis were: lung infection 27.5% (14), systemic infection 7.8 (4), immediate postoperative 17.6% (9), stroke 17.6% (9) and acute coronary syndrome 13.7 (7). The mean weight was 67.2 ± 7.6 kg (50.82). The group 1 were 58.8% (30) patients given a high carbohydrates diet, and the group 2 were 41.2% (21) given a low carbohydrates diet. The protein support for both groups were 104 ± 21 (66-142) grams and 1616 ± 280 (1102-2197) kcal. No significant differences were seen in both groups. Delta comparison of urinary nitrogen excretion between the group 1 and 2 was 2.01 ± 1.8 (21) and 0.48 ± 0.2 (30) respectively, with a p=0.05. Delta of prealbumin between group 1 and 2 was 0.87 ± 2.5 and 3.78 ± 2.2 respectively with a p=0.04. Delta transferrin between group 1 and 2 was 3.2 ± 17.8 and 29.1 ± 17.2 respectively with a p=0.02 and finally delta of lymphocyte between group 1 and 2 was 186 ± 246 and 519 ± 232.5 respectively with a p=0.01.

CONCLUSION. We found a significant difference in the catabolism degree and in the synthesis of prealbumin, transferrin and in lymphocytes cell formation in the low carbohydrates treated group.

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0509 SAFETY USE OF A HIGH LIPID INTAKE IN TOTAL PARENTERAL NUTRITION

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INTRODUCTION. Many studies have proved a lower morbidity and mortality with a glucose control. We believed that a non-protein caloric intake of 60% of lipids, allow a better glucose control, without increasing triglycerides (TOG) levels.

METHODS. This is a prospective, comparative, transversal and randomized study done between March 2005 and March 2006. We included all the abdominal postoperative surgery patients who need total parenteral nutrition (TPN) in the intensive care unit (ICU). We divided them in two groups: Group A (study) with a non-protein energy relation of 40% of carbohydrate (CE) and 60% of lipids; and Group B (control) with a non-protein energy relation of 40% of lipids and 60% of CE.

RESULTS. There was not a significant difference in the demographic variables between groups. Glucose at admission was 155 mg/dl ± 56 in group A and 129 mg/dl ± 27 in group B (p>0.02). The glucose level was lower in the group A at 24 and 48 hours (p<0.05) than in the group B. There were no significant difference in nutritional, inflammatory and metabolic values. Table 1.

| TABLE 1. | Group A | Group B | Group A | Group B |
|----------|---------|---------|---------|---------|
| Prealbumin mg/dl | 10.4 ± 6.54 | 9.0 ± 4.5 | 13.4 ± 7.6 | 13.0 ± 5.14 |
| Transferrin mg/dl | 115 ± 45 | 117 ± 37 | 125 ± 38 | 126 ± 37 |
| Cholesterol mg/dl | 108 ± 37 | 105 ± 32 | 111 ± 27 | 113 ± 32 |
| TGC mg/dl | 132 ± 57 | 164 ± 83 | 156 ± 75 | 176 ± 81 |
| Respiratory Weight | 82 | 82 | 84 | 84 |
| Uret Nitrogen/24 hours | 20.7 ± 4 | 13.5 ± 3 | 14.6 ± 3 | 16.7 ± 3 |

CONCLUSION. The use of a 60% lipid of non-protein caloric intake in the TPN is safety. It does not increase serum levels of TGC or cholesterol and do not deteriorate the assessed organic functions, with a better glucose control.
0510
PARENTAL NUTRITION IS ASSOCIATED WITH INCREASED CIRCULATING IL-6 AND IL-10 IN SEPSIS IN RODENTS

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INTRODUCTION. Enteral nutrition (EN) is preferred over parenteral nutrition (PN), yet in rodent sepsis PN is associated with higher IGFB-1 levels & rates of muscle protein synthesis [1]. A meta-analysis found early PN, compared with delayed EN, associated with lower mortality [2]. Mechanisms linking early nutrition & route of delivery to outcome are poorly understood. We found increased expression of suppressor of cytokine signaling (SOCS)-3 mRNA with PN in sepsis [3] & speculated this might affect serum cytokine profiles.

METHODS. Serum levels of IL-6 & IL-10 were measured by Quantikine Immunoassay in rats surviving 72 hrs after cecal ligation & puncture (CLP) or sham operation (Sham). Animals were fed with PN, EN or given i.v. saline (S).

RESULTS. Results are illustrated in the graphs.

CONCLUSION. Nutrition is associated with increased circulating IL-6 in sepsis whilst PN, compared with EN, results in increased serum IL-10. Further study is warranted to unravel the mechanisms by which nutrition affects outcome in sepsis.

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0512
IS BODY MASS INDEX AN INDEPENDENT RISK FACTOR FOR MORTALITY IN CRITICALLY ILL PATIENTS?

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INTRODUCTION. Obesity has been described as an independent risk factor for adverse outcomes in critically ill patients, with conflicting results. Recently, lower body mass index (BMI) has been associated with higher odds of death in the intensive care unit (ICU) population. The objective of this study is to determine the influence of BMI on ICU mortality, ICU length of stay (LOS) and nursing resource utilization.

METHODS. Retrospective analysis of a 19 bed ICU database from 2000 to 2005. The cohort was divided in post-operative and non-operative groups. Covariates were collected at admission to the ICU. Odds ratios were calculated for the odds ratio (OR).

RESULTS. Of 4104 patient datasets, 3521 were complete. Mean age was 64 years, 50.1% were women and median APACHE II score was 13. BMI < 20 was associated with increased predicted (p<0.001) and observed mortality in the non-operative group (OR = 1.56, 95% CI, 1.13 to 2.10) although multiple regression analysis did not identify BMI as an independent factor. We could not find any association between BMI and outcome in the non-operative group. There were no differences in ICU LOS or in TISS 28. The severely obese patients were more frequently female (p=0.001).

CONCLUSION. BMI has minimal effects on ICU outcome after patients are admitted to a critical care unit.

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0511
EFFECT OF 25-HYDROXY VITAMIN D SUPPLEMENTATION IN PROLONGED CRITICALLY ILL PATIENTS

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INTRODUCTION. We previously observed that critically ill patients requiring prolonged intensive care are vitamin D deficient [1]. Although 500 IU iv vitamin D supplementation daily did not normalize circulating 25(OH)D nor 1.25(OH)2D levels, an anti-inflammatory effect of exogenous vitamin D was revealed by suppression of serum CRP and IL6-concentrations if circulating 25(OH)D were significantly increased [1]. Apart from its classical effects on bone and calcium metabolism 1.25(OH)2D has important immunological effects on cytokine production and monocyte function. Presently, the effect of rapid and full normalization of the vitamin D status on inflammation and calcium metabolism in critically ill patients remains elusive.

METHODS. In this study, we randomly allocated patients upon ICU admission to receive either 10 days treatment with 15 μg 25(OH)D/d (following a 200 μg 25(OH)D iv loading dose, n=11) or placebo (n=13), on top of the currently advised daily 200 IU iv vitamin D supplementation. Patients with an anticipated ICU stay of >10 days were eligible for inclusion. Patients younger than 18 years, those suffering from chronic bone or kidney disease and those treated with glucocorticoids before ICU admission were excluded.

RESULTS. 25(OH)D treatment did not result in a significantly stronger decline in serum CRP over the 10-day observation period compared to placebo. Serum ionized calcium levels remained constant in all patients, while serum phosphorus levels fluctuated similarly in both treatment arms. Nor did daily SOFA scores nor length of ventilation be significantly influenced by the 25(OH)D supplementation. Noteworthy, ICU mortality was 1/11 in the 25(OH)D group and 2/13 in the placebo group.

CONCLUSION. These preliminary study results indicate that in contrast to the high 500 IU vitamin D regimen, iv 25(OH)D administration did not significantly effect the indistinct inflammation parameter CRP. The indistinguishable serum calcium and phosphorus levels suggest the absence of adverse effects on mineral homeostasis. Nevertheless, further unraveling of particular cytokine profiles, monocyte function and specific bone formation and resorption indices in these patients are required to deduce the value of intravenous 25(OH)D supplementation in prolonged critically ill patients.

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0513
SEPSIS AND FAT INTAKE IN CRITICALLY ILL PATIENTS

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INTRODUCTION. White blood cell count is routinely measured in septic patients and fat intake during parenteral nutrition (TPN) is available in the prescription, but correlation between these findings including clinical outcome has not been often addressed. In a prospective study with seriously ill, malnourished patients, impact of omega-6 lipid administration on clinical course was examined.

METHODS. Patients submitted to exclusive TPN (n=96) were investigated on the first day of therapy: Fat intake range (soybean oil emulsion) was 2%–48% of total calories. Variables included initial WBC, WBC change (final – initial), biochemical tests, duration of hospitalization and mortality. Stratification was done according to lipid calories >15% total calories or ≤15%. Pearson regression analysis was employed to compare the variables.

RESULTS. Age was 57.9 ±14.6 years (55.2% females), mean TPN intake was 1227 ±460 kcal/day, admission WBC was 13087 ±10220, duration of TPN was 13.4 ±5.6 days, total hospital stay reached 36.1 ±21.1 days, and mortality was 27.8%. Final WBC was lower when fat intake ≤15% (p=0.01). Similarly, WBC change negatively correlated with fat regimen (r= -0.242, p<0.05), and positively with high initial WBC and total lymphocytes (respectively r= 0.251 and r= 0.385, p<0.05 and p<0.01). There was no significant correlation with demographic, nutritional and outcome markers.

CONCLUSION. 1) Low-fat TPN had a favorable influence of WBC normalization; 2) The same occurred in patients with vigorous initial hemotologic reaction (WBC and lymphocytes); 3) Correlation of fat intake and corresponding WBC profile with hospital stay and mortality could not be demonstrated, probably because of the short duration of TPN, and moderate average lipid-energy intake. 4) Further studies with TPN and inflammatory response are necessary in malnourished septic populations.

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A CLINICALLY BASED CHEST X-RAYS STRATEGY REDUCES HEALTH CARE COSTS WITHOUT ADVERSE CONSEQUENCES

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INTRODUCTION. According to the American College of Radiology Expert Panel, daily routine chest x-rays (CXRs) are indicated in patients receiving mechanical ventilation (MV), although the effectiveness of these radiographs is unknown. Thus, the utility of daily routine portable CXR in MV patients (pts) remains controversial. After a survey about CXR indication, we decided that CXR should be obtained only on clinical indication. The aim of this study was to determine if patient mortality or survivors' quality of life was different with a policy of reducing the number of CXRs performed, the costs savings and the outcome impact.

METHODS. To calculate the number of CXR saved with this strategy during 2003 and 2004, CXR volume data were collected retrospectively using two databases and compared to the number of CXR that would have been performed with the daily routine strategy in MV pts. Costs savings were calculated by the product of CXR saved and reimbursement fee and the estimated variable cost of each CXR. Pts characteristics, severity of illness, duration of ventilation, outcome and ratios of observed to expected (O/E) mortality were compared with those of 1995 (before change in practice) and a regional database (Cub-Réa) to evaluate a potential impact on quality of care.

RESULTS. During the 2-year study, a total of 1,633 CXR were done in 957 consecutive ICU pts; 51% of them (488) needed MV, totaling 4,241 ventilator days. Our clinically based strategy saved at least 2,608 CXR which induced a cost saving of 94,644 euros for the payers and 33,226 euros for the institution. In comparison with 1995, 2003-2004 pts were older (p < .001), more severely ill (p < .001), more frequently ventilated (p < .001) but with a similar duration of ventilation and had higher mortality rate (p < .05); however, O/E ratios remained unchanged and were not different of those from Cub-Réa database (see table, results expressed as median and interquartile or number and percentage; x, 1995 vs 2003-2004, p < .001).

TABLE 1. A daily-routine chest radiograph (CXR) strategy is recommended by the ACR and practiced in many intensive care units (ICU). Its efficacy is controversial. Diagnostic and therapeutic efficacies, as well as costs, of daily routine CXRs were evaluated and compared with those of clinically indicated CXRs ("on demand").

O'Hare D; Chilvers R J: Arterial blood sampling practices in intensive care units in England and Pathol Lab Med 2003 Feb;127(2):162-8.

REFERENCE(S). Recommendations from the American College of Radiology Expert Panel on Thoracic Imaging. Routine daily chest radiography (CXR) in patients receiving mechanical ventilation (MV) is indicated in patients for predefined items like progressive or new infiltrates, pneumothorax, malposition of tube/lines) and are not accessible for intensivists.

CONCLUSION. Eight and nine years after the implementation of a clinically based strategy for CXR prescription, this practice is still followed, reducing health care costs without adverse clinical consequences.

WE DO WITH LESS?

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INTRODUCTION. Despite the efforts made by doctors and the introduction of cost cutting measures, health care expenditure related to medical prescriptions is soaring. Little data exist which shows what impact a limited action on blood tests prescriiptions may have in this phenomenon.

METHODS. In a 32-bed intensive care, we started a prospective policy of blood tests ordering reduction to learn if this would trigger a global cut down in physician-induced-costs without affecting clinical outcomes. Simultaneously, we determined over 18 months the financial costs of medical prescriptions (blood tests, radiology examinations, drug therapy). Statistical comparisons were performed with a Mann-Whitney test.

RESULTS. We achieved within 11 months a 34.9% reduction in blood tests prescriptions, and a 21.1% decrease in drugs prescription, a 44.9% reduction in anti-infection drugs, a 19.4% reduction of radiology investigations, and this at constant admission rates (n=1276.6 ± 5.7 months before vs n=1219.8 ± 13.1 / month after intervention; p=0.06) and with no increase in mortality. This allowed for savings evaluated at over 900 000 Euros per year of activity with no additional costs.

CONCLUSION. Even in a well trained staff, demanding working conditions, applying a policy of reduction in blood tests ordering (without endangering either patients or physicians), it is possible to trigger a substantial and long lasting decrease in total expenditure related to medical prescriptions.

IMPACT OF BLOOD SAMPLING ON IATROGENOUS ANEMIA IN ICU PATIENTS: CAN WE DO WITH LESS?

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INTRODUCTION. Unnecessary tests, inefficient ordering practices, and collection of more blood than it is required for testing may contribute to iatrogenic anemia in hospitalized patients. Aim of this study was to evaluate the extent of blood losses associated with sampling procedures in a 3 months period in a University Hospital medical ICU setting.

METHODS. 118 consecutive ICU patients (61 males, 57 females, mean age 56.7 years) were enrolled during the period of 3 months. The amount of blood taken for laboratory tests from every patient was monitored during this time. Total hemoglobin levels on admission and at the end of ICU stay were estimated.

RESULTS. Average ICU stay was 5.6 days (1-39). Blood sample volume on admission was 36.4 ml on average. Average daily blood withdrawal was 14.6 ml (0-95). Average blood loss during ICU stay was 81.7ml. The most excessive blood loss in a patient due to sampling were 590ml during the period of 39 days of ICU stay. Hemoglobin level on admission was 115.3 g/L, and it was 112.6 g/L on discharge, respectively (difference n.s.).

CONCLUSION. Blood sampling during ICU stay did not result into significant blood losses within the study group.

1. The highest blood losses appeared in septic patients and they were associated with frequent repeated blood culture samples.

2. We implies that patients with prolonged ICU stay requiring frequent monitoring are at risk of iatrogenous anemia due to blood samplings. Adequate ordering practice and appropriate sample sizes should be focused on.

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**0518**

**DO WE NEED EXTRA CAPACITY IN CRITICAL CARE: USING A CENSUS TO IDENTIFY UNMET NEED**

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**INTRODUCTION.** We studied the distribution of patients according to their required level of care, both on wards and in ICUs in one hospital to ascertain if there is still unmet need for critical care.

**METHODS.** The Royal Liverpool University Hospital is a 2004 bed hospital based on 2 sites which serves an inner city population and is a tertiary referral centre for specialised services. There are 3 critical care areas: a 13 bed ICU, 4 bed high dependency unit (HDU) and a 4 bed post operative critical care unit (POCU). On 26 January 2006 intensive care teams performed a census of levels of care, as defined by the Intensive Care Society, (1) for patients in every bed in the hospital.

**RESULTS.** On the wards 25 patients required level two care, 267 patients required level 1. 20 were deemed inappropriate for escalation of therapy but did not have DNAR orders. In Critical Care, the 13 bed ICU had 4 level 3 patients, and 9 level 2 and 1. The 4 bed HDU had 4 level 2 patients, 4 bed POCU 2 level 3 patients and 2 level 1 patients.

**TABLE 1.**

| Level of Care | Total | Percentage of ward based patients in the Trust |
|---------------|-------|---------------------------------------------|
| Level 2       | 25    | 2.3%                                        |
| Level 1       | 267   | 25.1%                                       |
| Level 0       | 717   | 67.4%                                       |
| Empty         | 43    | 4%                                          |

**CONCLUSION.** We found on the day of the census that there were a significant numbers of patients requiring level 2 care outside critical care areas while there were patients who did not require level 3 care in the ICU. Creating capacity in some cases is a matter of managing patient distribution better. When Payment by Results is introduced in the UK this will have serious implications for remuneration.

**REFERENCE(S),** 1. Intensive Care-Society: Levels of Critical Care for Adult Patients. London; 2002.

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**0519**

**CLINICAL UTILITY AND ECONOMIC IMPACT OF ADOPTING A BOWEL MANAGEMENT SYSTEM**

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**INTRODUCTION.** Patients suffering from burns are at increased risk of infection, particularly those of the burn wound and urinary tract. These patients are often obliged to stool in bed, increasing the likelihood that their wounds and urinary catheters will become contaminated with pathogens from the fecal stream. Despite its impact in terms of costs and adverse consequences, there is little published research on techniques of gastrointestinal (GI) waste management techniques. The purpose of this study was to examine the clinical utility and economic impact of introducing a proactive bowel management program using a bowel management system (BMS).

**METHODS.** The study was conducted as a Before/After trial in our burn unit. Patients receiving 5 or more BMS units (n=38) were matched with Control patients (n=38) on gender, age (Years), total body surface area (TBSA) burned, length of hospital stay, length of mechanical ventilation, and the burn location. Urinary tract infections (UTIs) and skin/soft tissue infections (SSTIs) were diagnosed using the National Nosocomial Infection Surveillance (NNIS) criteria by an independent infection control practitioner. Unscheduled dressing changes, and the resources consumed therein, were estimated based on staff interviews and a review of patient charts. Costs associated with the development of infections were estimated using published literature.

**RESULTS.** Significantly fewer patients developed both UTI and SSTI. Respectively, 15.8% (6/38) versus 47.4% (18/38) of patients developed UTI in the BMS and control groups (p<0.05) while SSTI was detected in 13.1% (5/38) of BMS patients and 26.3% (10/38) of the control group patients (p=0.05). Assuming each patient had at least one unscheduled dressing change per day for half of their stay, the average costs were $1390.00 and $5497.00 in the BMS and control groups respectively. Sensitivity analyses determined that in order for the BMS to lose this dominance, the infection rates would have to be equal, and the cost of an unscheduled dressing change less than $6.10.

**CONCLUSION.** In patients obligated to stool in bed, a proactive bowel management program using the BMS was effective in preventing both UTIs and SSTIs and cost substantially less than the standard reactive practice.

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**0520**

**ANTIBIOTIC USE MANAGEMENT PROGRAM: IMPACT ON QUALITY OF CARE AND COSTS IN AN INTENSIVE CARE UNIT**

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**INTRODUCTION.** The antibiotic use rationale influences various aspects of quality of care, and not only impacts microbiologically, but also economically. We believe the interaction of the ICU manager, the intensive care staff and the infectologist on an antibiotic use management program can reduce costs and improve patient safety and quality of the intensive care.

**METHODS.** We implemented an antibiotic use program on the third trimester of 2004, based on the best practices regarding empirical therapy, guided by the sensitivity of most prevalent germs on our ICU on 2004, period of treatment, and alteration of antibiotics according to culture results within 48 to 72 hours. The program also included the infectologist working hours at the hospital increase, raising the availability for training the ICU staff on nosocomial infection issues, and monthly presentation of the epidemiological surveillance data to the ICU staff leaderships. We checked the antibiotic use throughout 2004 and 2005, comparing one to each other and to the NNIS publications results.

**RESULTS.** We observed an average antibiotic use drop in 2005 compared to 2004 of: carbapenems 57 to 12 daily doses/1000 patient-days (79%); piperacillin/tazobactam from 104 to 52 daily doses/1000 patient-days (50%); vancomycin 25 to 8 daily doses/1000 patient-days (68%); fluoroquinolones from 89 to 37 daily doses/1000 patient-days (58.4%); aztreonam from 31 to 12 daily doses/1000 patient-days (61.4%).

**CONCLUSION.** A multidisciplinary antibiotic use management program was able to massively impact the amount of daily doses consumed at the ICU, aligning the previous medical culture to current best practices, increasing patient safety by reducing the risk of drug resistance emergency and unwanted side effects, and also, drastically reducing costs.

**REFERENCE(S),** National Nosocomial Surveillance (NNSS) System Report, data summary from January 1992 to through June 2004, issued October 2004. Am J Infect Control, 2004 Dec;32(8):470-485.
The strategy of training, daily follow up of the process and checking the staff adherence occupied by a patient waiting for discharge. This could also reduce costs related to drugs use, with sometimes deeply grounded in the medical culture. From 1st August – 31st August 2005, nursing staff recorded patient activity in each critical care unit, the patient's care was recorded in a 'virtual bed' for their entire stay. The logistic load arising from a major incident is predominantly associated with its organisational characteristics or staffing being significantly different compared to baseline. A retrospective review of the 7th July Major Incident case notes and the Intensive Care Unit, University College Hospitals London, Austria, USA of Cuidados Intensivos Polivalente, Hospital de St. Antonio dos Capuchos, Lisbon, Portugal.

INTRODUCTION. Variability in intensive care patient process with respect to resource use or outcome has been shown for specific subgroups. But information is limited whether such variability also exists in general samples of ICU's, and to what extent organisational characteristics or staffing are associated to it. Primary aim of this study is to test if there is wide variability in resource use and outcome in a recently collected dataset. Secondary aims are to test whether outcome and resource use are related to ICU structure and process, and to explore factors associated to efficient resource use.

METHODS. Secondary analysis of SAPS 3 database. Outcome was estimated using standardized mortality rate (SMR). ICU length of stay was used as surrogate for resource use. Standardized resource use (SRI) was calculated with adjustment for severity of acute illness. Each unit was assigned to one of 4 groups: 1) "most efficient": SRI and SMR < median of all units; 2) "least efficient": SRI and SMR > median; 3) "overachieving": SRI < median, SMR > median; 4) "underachieving": SRI > median, SMR < median. Univariate analysis and stepwise logistic regression were used to test for factors of structure and process that might distinguish "most efficient" from "least efficient" ICU's.

RESULTS. 275 units (16,560 patients) were included. Overall, SRI was 1.06±0.47 (1.000-7.77-1.28 (mean±SD) (median[IQR]); SMR was 1.67±2.78 (1.070-7.61-5.8). In group 1-4, there were 91, 91, 47 and 46 units, respectively. In univariate analysis, significant variables representing structure and process were: physician/bed (P=0.026), IM specialist/bed (0.010), nurse/bed (0.035), clinical round (+0.001), availability of physicians on weekends (0.055), availability of physicians on weekends (0.012), presence of emergency dept (0.027), and geographical location of ICU (< 0.001). In multivariate analysis, only clinical rounds (0.013), emergency dept (0.004), and geographical location (0.001) were significant.

CONCLUSION. Despite considerable variability in outcome and resource use, few factors of ICU structure and process were identified as associated with efficient use of the ICU. This suggests that other complicating factors not included in this study play an important role.

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The Intensive Care Workload After the 7th July London Suicide Bombings

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INTRODUCTION. The suicide bombings of July 7th 2005 stretched the resources of 5 hospitals across London. The critically injured casualties were responsible for the bulk of the logistic load in the days that followed the attacks. This abstract discusses the intensive care workload associated with the management of those casualties.

METHODS. A retrospective review of the 7th July Major Incident case notes and the Intensive Care National Audit and Research Centre (ICNARC) database.

RESULTS. There were 700 casualties in total with 52 immediate fatalities. Following initial assessment at the 5 receiving departments 103 casualties required hospital admission. Of these 20 patients were critically unwell and admitted to intensive care units. There were only 3 subsequent in-hospital deaths with one death occurring before admission to ICU was possible. The critically injured patients accounted for 3% of the total number of ICU admissions (Mean Length of Stay = 10.46 days, Mean APACHE II = 12.74, Mean SAPS II = 31.68). Injury Severity Score data were sought but were only available for the 7 ICU admissions at the Royal London Hospital. All of the critically injured patients arrived within the same two-hour period and both intra and inter-hospital transfers were required to accommodate them.

CONCLUSION. The logistic load arising from a major incident is predominantly associated with the identification and treatment of the critically injured casualties and the high rate of arrival of these patients. Small increases in the fraction of patients who are critically injured will have a significant impact on the ability of receiving hospitals to cope. Occasionally London coped well during the July 7th suicide bomb attacks, however, to be able to manage higher casualty numbers we must better understand the capacity that exists across the region, reinforce inter-hospital communication and move towards coordinating the response of London hospitals so that they function as well as a network they did in isolation on 7th July 2005.

Cost Reduction, Profit and Quality of Care Increase due to a Drug Choice Management Program

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INTRODUCTION. Evidence-based medicine has been a tool to improve quality of care of ICU patients and to achieve better outcomes. We believe we could also reduce costs related to drugs use, with best medical practice, evidence-based management of drug choice.

METHODS. We promoted several meetings with the medical staff from January to April 2005, discussing ten issues related to drugs choice and costs. We established evidence-based protocols that were implemented throughout the first semester. In the year of 2005, we checked the use, cost and profitability of drugs involved in 4 established protocols: enoxaparin, non-fractioned heparin, noradrenaline, dopamine, ranitidine, proton pump inhibitors and midazolam by the Medicine/Drug Index (MDI), obtained by the following formula: sum of costs in US dollars of the drugs above divided, by the number of patient-days on the semester. We also obtained the APACHE II Score and the mortality at the ICU.

RESULTS. After the educative meetings and motivating the staff day by day, we reached 97.5% of staff adherence to the protocols and observed a reduction of MDI, on the second semester of 23.37%. There was also an increase on the profitability with the new protocols from 2.7 to 5.0 times the cost. These changes represented a gain in the second semester of US$ 50,540.00. The mean APACHE II Score on the first and second semesters were 11.9 and 8.4, and the mortality rate on the ICU, similar to the risk estimated by the APACHE II, was 6.34 and 5.51%, respectively.

CONCLUSION. The strategy of training, daily follow up of the process and checking the staff adherence to protocols was crucial to change behaviors sometimes deeply grounded in the medical culture, although poorly evidence based. This action plan that involved only 4 protocols, reduced costs, did not increase mortality, and more - once the operating profits related to the drug choice proposed in the new protocols was larger - we promoted an increase in the profitability. The implementation of a quality process, based on the PDCA tools, planning the strategy of action, followed by results checking, helped us to accomplish our reducing cost goals, without any decrease in quality of care.

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Critical Care Patient Flow Analysis - a System to Demonstrate Unmet Needs

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INTRODUCTION. Patient flow analysis has been developed by the Modernisation Agency Critical Care Programme and continues to be explored by the National Critical Care Patient Flow Steering Group. It is a simple audit tool to record the type of activity occurring for each critical care bed on an hourly basis. The audit process has been adapted by Critical Care Services at the James Cook University Hospital to reflect local demands. Analysis of this information has been used to demonstrate inefficiencies in bed utilisation and quantify unmet need.

METHODS. From 1st August – 31st August 2005, nursing staff recorded patient activity in each critical care bed on an hourly basis over each 24-hour period. Information collected included the level of care of the patient, whether the bed was appropriately occupied, empty, closed or awaiting a booked admission. If the bed was inappropriately occupied, the reason for this was also documented. To give an indication of unmet need, patients cared for by critical care staff outside the unit were classified as being in a ‘virtual’ bed. If admission was denied because of bed shortages resulting in transfer of the patient to another unit or hospital, the patient’s care was recorded in a ‘virtual bed’ for their entire critical care stay.

RESULTS. Over the audit period, there were 55 admissions and 56 discharges with a mean length of stay (LOS) of 7.2 days and a median LOS of 3.2 days. Occupancy in ICU was 93.7% (9794 hours) during the audit. ICU beds were occupied by level 3 patients for 73.9% of the audit period (7723 hours). In comparison, bed occupancy by patients classified as level 2, 1 or awaiting discharge was 19.8%. 352 bed hours were lost due to critical care beds being occupied by a patients waiting for discharge. This equates to having a bed closed for nearly 2 weeks. In addition, there were two occasions where the unit’s capacity was exceeded by 32 hours.

CONCLUSION. Patient flow analysis is a useful tool not only to measure unmet need but also to highlight inefficient utilisation of limited resources. It has prompted review of discharge planning and level 2 bed capacity.

REFERENCE(S). NHS Modernisation Agency (2005): Improvement Leaders Guides: Improving Flow.
Despite no statistically significant improvements in promptness of interventions or antibiotic administration, and intensivist notification with septic shock. We evaluated relative adrenal insufficiency in patients with septic shock. Absolute adrenal insufficiency is defined by a unstimulated plasma cortisol level (PCL) < 15 µg/dl. Relative adrenal insufficiency is defined by a maximal increment of PCL after a 250 µg ACTH stimulation test < 9 µg/dl. The maximal increment in PCL is the largest difference between PCL 30 and 60 minutes after a 250 µg ACTH stimulation (T90 and T60) and PCL just before ACTH stimulation (T0). The diagnosis of adrenal insufficiency has important therapeutic relevance: a 5- to 7-day period of corticosteroid administration at low dose is associated with earlier shock reversal at 8 days, and a reduction in mortality at day 28. We hypothesized that T30 was of limited interest in the diagnosis of relative adrenal insufficiency in septic shock patients.

RESULTS. Mean (SD) total lifetime discounted costs were £63,417 (27,239) for rFVIIa and £50,680 (26,326) for PBO. Relative cost-effectiveness was £12,727 (6,100) for rFVIIa and £18,100 (9,450) for PBO. Results were most sensitive to the discount rates and health state utility values used. All estimates of incremental cost/QALY gained were <£50,000, and the probability of rFVIIa being cost-effective vs PBO was large. Incremental cost-effectiveness ratios are consistent with the National Institute for Health and Clinical Excellence threshold for cost-effective therapies [2].

CONCLUSION. These preliminary results suggest that, relative to PBO, rFVIIa may be a cost-effective treatment as adjunctive therapy for the control of bleeding in severe blunt trauma patients to the UK NHS.

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0526

COMPARATIVE EFFECTIVENESS OF RFVIIA FOR BLEEDING CONTROL IN SEVERE BLUNT TRAUMA PATIENTS IN THE UK

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INTRODUCTION. In an international, randomised, placebo (PBO)-controlled Phase II study recom-
mended active comparator such as vitamin K and low molecular weight heparins. Among all severe blunt trauma patients (p=0.07) and those alive within 48 hours (p=0.02) with mi-
nor trends towards reduced mortality (25% vs. 30%, p=0.63) and increased ICU-free days (12 vs. 8, p=0.3) [1]. This study assesses the lifetime cost effectiveness of rFVIIa vs PBO as adjunctive therapy for bleeding control in patients with severe blunt trauma in the UK, based on this preliminary evidence.

METHODS. Incremental costs per quality adjusted life year (QALY) gained and per life year gained with rFVIIa vs PBO were determined using data from severe blunt trauma patients in the trial (n=145; days 0-30 post trauma). [1] 375 blunt trauma patients in the UK Trauma Audit and Research Network (days 30-90 post trauma), 166 Scottish ICU trauma patients (days 90-90 years), and UK life tables. Costs (2004 UK€) assessed from a National Health Service (NHS) perspective, included all trauma-related health care costs accruing to rFVIIa and PBO. Future costs/benefits were discounted at 3.5%.

RESULTS. Mean (SD) total lifetime discounted costs were £63,417 (27,239) for rFVIIa and £50,680 (26,326) for PBO (p=0.01; 95% CI: 2.764-22.72). rFVIIa yielded an additional average 1.05 life years (p=0.54; 95% CI: 2.3-4.4) and 0.70 QALYs (p=0.54; 95% CI: 1.5-2.9) vs PBO (assuming 67% health state utility value for all survivors at hospital discharge). Incremental cost was £12,127 (6,100) year gained and £18,100 (9,450) QALY gained. Results were most sensitive to the discount rates and health state utility values used. All estimates of incremental cost/QALY gained were <£50,000, and the probability of rFVIIa being cost-effective vs PBO was large. Incremental cost-effectiveness ratios are consistent with the National Institute for Health and Clinical Excellence threshold for cost-effective therapies [2].

CONCLUSION. These preliminary results suggest that, relative to PBO, rFVIIa may be a cost-effective treatment as adjunctive therapy for the control of bleeding in severe blunt trauma patients to the UK NHS.

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0527

A SYSTEM APPROACH TO ORGANIZING OF THE RATIONAL ANTIBIOTIC USAGE IN THE CITY HOSPITAL

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INTRODUCTION. The uncontrolled structure of antibiotic purchasing and unrestricted usage of anti-
biotics in the Hospitals in Russia has induced the growth of resistance in the hospital microbial flora in the Intensive Care Unit (ICU).

METHODS. The methods for solving the problems of quality clinical practice in antibiotic-usage were: 1) system analysis, 2) organizing methods, 3) education, 4) monitoring.

RESULTS. 1. The proportion of beta-lactam antibiotics in the total antibiotics purchase was reduced from 88% to 63%. 2. The system of control of the antibiotic prescriptions and antibiotic therapy re-
duced the number of incorrect prescriptions (p<0.05). 3. Implementation of protocols brought about a reduction in the length of antimicrobial-therapy courses (in days) in the ICU of the neurosurgery department (p=0.05).

TABLE 1.

|                  | 2005 - 1 quarter | 2005 - 2 quarter | 2005 - 3 quarter | 2005 - 4 quarter |
|------------------|------------------|------------------|------------------|------------------|
| Prescriptions/ipt | 3.1              | 1.9              | 1.8              | 1.5              |
| Doses/ipt        | 5.8              | 5.7              | 5.5              | 3.8              |
| Days/ipt         | 36.7             | 24.6             | 28.8             | 16.6             |

CONCLUSION. The system approach to the organizing of the antibiotic-usage has produced an im-
provement in the rational consumption of the antibiotics at the City Hospital. The improvement was accom-
plished by changes in the antibiotics purchasing structure after 2 years of implementation of the system.

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care, 2001:3. Starostov V, Lugovkina T. “Clinical Governance (Theory and Practice)”. Moscow: Medicine, 2003. - 190p.
INTRODUCTION. The objective of this study is to determine the mortality of the cirrhosis patients admitted to the intensive care unit and to identify specific predictors of mortality.

METHODS. Retrospective analysis of patients records (2000 to 2005). Setting: 4 medical-surgical ICU. Liver cirrhosis was defined histologically or was based on clinical, imaging, and laboratory findings. Measurements: demographics data, disease severity indices and clinical features on admission: Coma (Glasco coma score <8), hypotension (< 90 mmHg), heart rate, laboratory findings, need of Swan-Ganz, inotropic drugs, dialysis, transfusions and need for mechanical ventilation. The primary analysis compared hospital cirrhosis survivors with nonsurvivors. Student’s test was used to compare means, chi-square test for proportions. The outcomes for these cirrhosis patients were compared with those for matched control subjects without cirrhosis, controlling the level of severity (MPM2a +/- 5), gender and age (+/- 5).

RESULTS. 184 cirrhotic patients were admitted to the ICU, over 8202 entered patients in the study period, represented 2.2% of the total population, 71.2% men, average age of 59, average stay of 6.8± d, mortality in ICU of 51.6% and the nonremitting of 19% (p<0.001). Cirrhosis survivors vs. nonsurvivors: Apache III, MPM2a, coma, hypotension, need of inotropic, arterial line, mechanical ventilation, renal replacement therapy, transfusion of platelets or plasma, parenteral nutrition, bilirubin and infection were associated with an increase in mortality using univariate analysis. On multivariate analysis the mechanical ventilation OR 3.4 (95% CI 1.1-9.9), APACHEIII OR 1.04 (95% CI 1.02-1.05) and the need of inotropic drug OR 8.9 (95% CI 2.7-29) emerged as independent predictors of mortality. Match-control study: There were no significant differences in the mortality observed in the hospital for the cases and the control subjects (56% vs. 49%, p=0.22, 95% CI, -4% to 18%) or the ICU stay (7.6± vs 9.6±, p=0.06, 95% CI: -0.7 to 1).

CONCLUSION. The cirrhotic patients admitted to the ICU have a poor prognosis, but is not different of the prognosis of patients with the same level of severity. The APACHEIII, the need of inotropic drugs and the mechanical ventilation were independent predicting factors of mortality in cirrhotic patients admitted in the ICU.

Grant acknowledgement. to all my collaborators.

0532

EPIDEMIOLOGY OF SEVERE SEPSIS IN CHINA: INCIDENCE, OUTCOME, COST IN 10 ACADEMIC MEDICAL CENTERS

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INTRODUCTION. Severe sepsis is associated with high morbidity and high mortality, and represents a substantial health care burden in the United States and Europe. However, little data on the epidemiology of severe sepsis in developing countries is available. The purpose of this study was to investigate the epidemiology of severe sepsis in surgical intensive care unit in chinese multiple academic medical centers.

METHODS. Data were abstracted from the discharge databases of surgical ICUs in 10 academic medical centers during 2005 by trained investigators. Age, sex, length of stay in hospital, length of stay in ICU, primary health state, major diagnosis, outcome, hospital costs were collected. APACHE II scores and SOFA scores within the first 24-hrs after the diagnosis of severe sepsis and at the highest points were recorded. TISS were used to reflect the workload of nursing. Quality control was done. Data from categorical variables were compared by analysis of variance and data from continuous variables were compared by chi-square test or Fisher’s exact test, with the use of SAS software.

RESULTS. Totally, 8225 patients were admitted to the survey units, and 362 (4.47%) met the criteria for severe sepsis. The 28-day mortality rate was 46.1%, and 90-day mortality was 49.2%. The total cost was $2989006.2 during 2005. Major risk factors for the mortality were APACHE II, SOFA, older age, multiple sites of infection, respiratory failure and shock. Both pulmonary and abdomen infection were documented more than half of the infection, with gram-positives organisms being the most frequent isolates of the infection. The incidence of severe sepsis was higher in males than in females.

CONCLUSION. This multi-academic medical centers study documents that severe sepsis is a common, expensive, and frequently fatal disease in China, which is similar to the recent findings from USA and European.

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0534
SURVIVAL AFTER RENAL REPLACEMENT THERAPY
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INTRODUCTION. Renal replacement therapy (RRT) carries a significant burden in mortality, cost, and delivery. The aim of this study was to determine overall survival after RRT whilst in intensive care (ICU), to identify the patient sub-groups who survive, and to determine what proportion of these patients will require long term RRT.

METHODS. We performed a retrospective analysis of all patients admitted to our 16 bedded, mixed (excluding Cardiothoracic) adult ICU, over a 2-year period. Our hospital is unique in being the only centre within a 50-mile radius to offer RRT at an ICU level. The data was collected from Ward Watcher software and renal registry databases. RRT was defined as the need for haemodialysis or haemofiltration whilst on intensive care.

RESULTS. 1376 patients were admitted (average age 56 (14-92), average APACHE II 16.2 (2-43), of which 204 required RRT (average age 59.6 (19-86), average APACHE II 24.2 (10-43). 42% of the RRT patients survived until hospital discharge. 3.4% required longer term renal support and none of these patients survived longer than 8 months. Overall mortality increased markedly above the age of 60 (See table), nobody surviving above the age of 78. 20% of our patients were transferred to us and in this group survival was significantly improved (p=0.01). Women accounted for 41% of all admissions, but only 31% of women received RRT (p=0.001). Mortality was higher in women who did not receive RRT, (31% cf. 25% for men, p=0.05), than women who did (46% and 64% respectively (p=0.05)).

Table 1.

|          | Overall% Survival | % Survival after transfer |
|----------|------------------|--------------------------|
| Age <60  | 53%              | 73%                      |
| Age 60-70| 36%              | 60%                      |
| Age >70  | 30%              | 69%                      |

CONCLUSION. 1) Consideration must be given to the efficacy of RRT in the very elderly. 2) Women receiving less RRT possibly due to the use of absolute creatinine levels rather than GFR to determine the degree of renal failure. 3) Sicker patients may not survive to transfer. 4) In patients who survive to hospital discharge, renal recovery is the norm.

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0535
DELIURIIUM PREVENTION STRATEGIES: TARGETING AND IMPROVING OUTCOMES
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INTRODUCTION. Delirium in ICU is common and is associated with adverse outcome; it may be potentiated by medication-induced coma. Protocols are believed to result in improved care and better outcome. We evaluated the impact of a protocolized approach to sedation and analgesia in the ICU on the incidence of delirium and on the associated outcome.

METHODS. The study was conducted by reviewing medication use, incidence of delirium and patient outcome in a single tertiary care mixed ICU during two periods: 'pre' (Aug 2003-Feb 2004) and 'post' (Aug-Nov 2005). There were no sedation/analgesia protocols in use during the 'pre' period, but there was during the 'post' period. The protocols required nurses to assess and document levels of analgesia, sedation & anxiety, and presence of clinical delirium features. Protocolized interventions included non-pharmacological approaches as well as pharmacological interventions for analgesia, sedation and delirium that were based on validated assessment tools.

RESULTS. 537 patients were evaluated in the 'pre', and 599 in the 'post', cohort (after exclusion of comatose patients). APACHEII scores were higher in the 'post' group (17.4 vs. 16.2, p=0.0057). All patients in the 'post' cohort were assessed as above, but while 57.4% had sedation/analgesia managed by protocol 42.6% did not. The incidence of medication-induced coma, ICU & hospital length of stay (LOS), and percent discharged to dependent care was significantly lower in the 'post' cohort. The 'post' cohort received significantly less opiates, had better analgesia and comparable levels of sedation and anxiety (Table 1). The incidence of delirium was similar (55.2% pre vs. 33.8% post, p<0.001). Although the institution of the protocolized care was associated with significantly improved patient outcome, it was more significant in those patients in the 'post' cohort who were not managed with a pharmacologic protocol.

CONCLUSION. Protocolized nursing assessments of pain, sedation and delirium were associated with improved short-term and long-term outcome. However, medication administration that was not protocol-driven resulted in even better outcome. These data suggests that it is individualization of care, and not protocolization, which accounts for improved outcomes.

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0538
STUDY OF OUTCOME OF HAE MATOMALGY MALIGNANCY PATIENTS ADMITTED TO ICU

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INTRODUCTION. Haematological malignancy patients on ICU have a poor outcome. This is a retrospective observational study of haematological patients admitted to our ICU over seven years, to determine their outcomes and how they differed from that suggested by the literature.

METHODS. Data were collected for patients with a haematological malignancy admitted to ICU between the years 1999 and 2005. Medical records for these patients were obtained, and demographic, clinical, APACHE II and outcome data were recorded.

RESULTS. 93 of 106 medical records were available. Median age was 55 years and median APACHE II score of 27. 43 (47.3%) survived to ward discharge. Only 27 (32.5%) survived to leave hospital. Admission diagnoses were severe sepsis in 38 (43.5%) patients and respiratory failure in 36 (41.5%). 50% required invasive ventilation with equal numbers remaining spontaneously ventilating or receiving non-invasive ventilation. The as the only organ supported group was 59 (55%) which was poorer than if self-ventilating with no other organ support (73/87.5%). The requirement for inotropic support in addition to invasive ventilation further reduced survival (72/24 (29.1%).

TABLE 1.

Comparison of Benoît and Leicester data using the Benoît stratification

| Stratification | Benoît (% survival) | Leicester (% survival) |
|---------------|---------------------|------------------------|
| Low Risk      | 75                   | 43                     |
| Intermediate  | 35                   | 37                     |
| High Risk     | 4                    | 23                     |

CONCLUSION. ICU and hospital survival were similar to previous studies. Application of the Benoît stratification to our study cohort (table 1) produced different than expected results. Predicting outcome in this ICU patient group remains difficult but those patients needing both respiratory and inotropic support have a poorer prognosis.

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0539
SERIOUS ADVERSE DRUG EVENTS IN IMMUNODEFICIENT PATIENTS AT ADMISSION TO INTENSIVE CARE UNIT

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INTRODUCTION. Immunodeficient patients may be at risk of adverse drug event (ADE) because they cumulate toxicity of cytotoxic agents and of many other drugs. Immunosuppressors have short therapeutic index when few therapeutic alternatives are available (1). The aim of this study was to assess characteristics and frequency of serious ADEs in immunodeficient patients at the admission to ICU.

METHODS. We prospectively included all adult patients admitted in a medical intensive care unit during a 6-month period. Immunodeficiency was defined as primary or acquired immunodeficiency. For each drug taken in the previous month and each organ failure, a putative ADE was suspected and a questionnaire systematically filled. Each patient was followed-up to determine if serious ADE contributed to organ failure (2). Admission diagnoses were severe sepsis, respiratory failure, cerebral dysfunction in intensive care unit patients.

RESULTS. Among the 450 patients admitted from may to october 2003, 79 (19.5%) were immunodeficient. Among them, 35 have presented at least one ADE related organ failure and 23% were hospitalized because of an ADE. In 68% cases, ADEs were predictable, 37% were potentially preventable, 12.5% were rare, and 21% contributed to death. Mortality, workload for personnel, and length of stay were the same in immunodeficient patients with and without ADE. 71 were still hospitalized 28 days after ICU discharge. Metabolic ADEs linked to glucocorticoids, cyclosporin and immunoglobulins were mostly preventable.

CONCLUSION. ADEs involving critically ill immunodeficient patients were common and potentially life-threatening (2). Although many of the involved drugs have proven benefit, measures should be put into place to minimize ADE and thereby further improve diagnosis of preventable ADEs.

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**0542**

**CRITICALLY ILL PATIENTS ON GENERAL WARDS: CAN WE PROVIDE CARE ‘WITHOUT WALLS’?**

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**INTRODUCTION.** There is evidence that provision of more care by registered nurses is associated with decreased complication rates [1]. In the UK, recommended nurse: patient ratio for level 2 patients is 1:2 [3]; however there is no agreed standard for levels of staffing or skill mix on acute wards. We took part in a census of patient dependency and ward staffing, on one day in our hospital, to help assess whether wards were equipped to care for critically ill patients.

**METHODS.** The Royal Liverpool University Hospital is a 1064 bed hospital which serves an inner city population and as a tertiary referral centre for specialised services. There are 3 critical care areas with 21 designated levels 2 and 3 beds. A census of levels of care (as defined by the Intensive Care Society [4]) was performed on 1 day in January 2006. Intensive care teams visited each ward and assessed levels of care of each patient in each bed; in addition the numbers of trained and untrained nurses caring for these patients was recorded.

**RESULTS.** 25 patients needed level 2 support on general wards; none of them were staffed to achieve 1 nurse to 2 patients. The overall ratio of qualified (RN) nurses/ patient was 1:9.74. The ratio of all nurses, qualified and unqualified was 1:4.81. The range was large, with some wards having 1:3 ratio, while one ward with 4-level 2, 12 level 1 and 14 other patients had 4 trained staff.

**CONCLUSION.** It appears that critically ill patients are cared for on wards with less than optimal staff numbers. If these patients are cared for outside ICU, staff need to receive training and there should be adequate numbers. We have found that levels of staffing and skill mix vary considerably between wards of the same hospital. Roles should be redesigned to enable staff to match their skills to the needs of their patients.

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**0543**

**BETTER CARE WITHOUT DELAY**

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**INTRODUCTION.** Prolonged length of hospital stay increases the risk of hospital acquired infection and accelerates general debilitation in the elderly. The aim of this study was to identify the causes of delay in treatment and patient discharge, noting in particular the documentation of observations and its impact on treatment decisions.

**METHODS.** The Nurse Consultant Critical Care and the Service Improvement Manager examined the notes of 51 patients discharged from Musgrove Park Hospital during March 2004 with a length of stay of more than 10 days. For each patient the following was recorded: Date of admission, date of discharge, admission, consultant, date of requests for texterrals, date of diagnostics/referrals completed, infection, discharge date, and exceptional events.

**RESULTS.** The study highlighted omissions in carrying out and recording observations, and enacting doctors’ requests. At times we failed to listen to the requests of dying patients, made late referrals to the Palliative Care Team and sometimes admitted patients inappropriately to secondary care. There were significant delays with nutritional support.

| TABLE 1 | Discharge delay | Cdiff | MRSA | Overall infection ra |
|---------|----------------|-------|------|---------------------|
| Medical Division | 30 (81%) | 4 patients | 4 patients | 22% |
| Surgical Division | 8 (62%) | 2 patients | 0 | 15% |
| TOTAL | 38 (75%) | 6 (12%) | 4 (8%) | 10 (20%) |

**CONCLUSION.** (i) Launch of Trust Quality 1st Initiative.

(ii) Introduction of colour-coded observation charts to provide visual trigger for vital signs.

(iii) Trust-wide Patient At Risk (PAR) Cor-ordination 24/7, multi-disciplinary team of physiotherapists, physicians, clinical site management, nurse consultant, anesthetists.

(iii) Introduction of the Liverpool Pathway for care of the dying

(v) Introduction of Trust Nutrition Team, including Biochemist and Gastroenterologist.

**0544**

**PATIENT BENEFITS OF IMPLEMENTING BRACHY RADIATION THERAPY IN AN ICU**

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**INTRODUCTION.** In 2004 surgeons and oncologists made inquiries about brachy radiation therapy (BRT) right after advanced cancer surgery in the pelvis. Offered in an ICU allows respiratory and haemodynamic unstable patients to receive BRT the day after surgery. The idea is to effectuate the BRT as soon as possible to eliminate the remaining cancer cells. Before implemented in the ICU the patient had to wait up to 10 days lying flat on their back receiving BRT at the oncological ward.

**METHODS.** Interstitial BRT with Pulse Dose Rate during 50 h. is used after advanced cancer surgery in the pelvis. Key-staff from ICU worked out standards for the implementation, after having visited oncological wards with brachytherapy. Also they were involved in the design of the radiation room. ICU special trained nurses were selected from the staff on a non-mandatory basis. 14 ICU nurses (50 employed in total) received special training theoretical as well as practical for one day. The rest of the staff received 2 hours about radiation hygiene and must at all times carry a dosimeter to monitor potential radiation. There is one nurse per patient while the patient is admitted in the ICU. Interviews were made by nurses before and after surgery. Standard control was followed according to cancer diagnosis.

**RESULTS.** During the first 12 months 10 patients were treated with BRT after advanced cancer surgery. Severe complications caused by the BRT were not reported. The technical parts of working with the brachy therapy caused only minor delays. The 50 h. therapy were completed with a delay (1.3 h.) The patient comfort has increased with the earlier effectuation of the BRT. Now they spend 7 days less lying flat on their back, which benefits the mental well being of a cancer patient and reduces complications caused by immobilisation. Interviews have reported an increase feeling of more safety and security while cared for and surveillanced by the ICU nurses.

**CONCLUSION.** The post-BRT interviews show an increase in comfort due to shorter time lying flat on their back and the 24 h. nursing.

**0545**

**TACHYPNOEA, THE CRITICAL VITAL SIGN**

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**INTRODUCTION.** Respiratory rate has been identified as the most significant indicator for deterioration (i) as has level of consciousness (2) and hypotension (3). This study evaluated compliance with the vital sign standard and identified the most commonly deranged vital sign in the 12 hours prior to cardiac arrest from January 2004 to December 2005.

**METHODS.** An audit project was registered with the clinical effectiveness department to evaluate compliance with our vital signs standard and identify premonitory indicators. 412 sets of patient case notes were examined to identify real cardiac arrests, 180 were included. 448 sets of vital signs were scrutinised. All data were collected on specifically designed forms and transcribed to an excel database.

**RESULTS.** Of the total 448 sets of vital signs there were 272 (60.7%) temperatures; 409 (91.2%) pulse rates; 410 (91.5%) blood pressures and 574 SpO2 (83.4%). Each of these were examined for frequency and derangement. There were 18 (6.6%) instances of deranged (<55.5 temperature; 63 (15.4%) instances of deranged (<60. >120) pulse; 157 (60.3%) instances of deranged (<140 - > 26) respirations; 84 (20.4%) instances of deranged (<100 systolic; > 100mmHg diastolic) blood pressure identified and 140 (37.4%) instances of deranged (<99%) SpO2. During the audit period respiratory rate monitoring improved and cardiac arrest rates reduced by 31%.

**CONCLUSION.** Respiratory rate is an early and accurate indicator of deterioration and should be measured with every set of vital signs undertaken. Within our Trust, increased teaching and the introduction of a MEWS system have increased vital sign monitoring, improved referral to the outreach team and facilitated early intervention.

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0547

INTENSIVE CARE DIARIES MAY REDUCE LATER SYMPTOMS OF POSTTRAUMATIC STRESS DISORDER

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INTRODUCTION. Diaries written during the patients stay in the intensive care unit (ICU) are becoming increasingly popular. Initially it was felt that these diaries would help patients understand their illness better and fill gaps in the patients memory for ICU. The impact of such diaries on psychological recovery has not been examined before. During a project comparing the psychological recovery of patients we took the opportunity to examine the influence of diaries.

METHODS. The study was part of a prospective study undertaken in 5 ICUs examining the incidence of post traumatic stress disorder (PTSD). In 3 of the study ICUs some patients received diaries. Starting a diary was not randomised but done when staff had time. This was an opportunistic study of an intervention that was happening at the time of the main study. After ICU discharge the patients recall for ICU was assessed. At three months post ICU discharge the presence of PTSD-related symptoms was measured using the PTSS-14 screening tool.

RESULTS. 241 patients were recruited to the main study, with 117 at the three study centres doing diaries. Of the 117 patients, 42 received a diary. The level of PTSD-related symptoms at 3 months post ICU discharge was lower in those receiving a diary (Mann-Whitney U p = 0.04). When just those patients recalling delusional memories for ICU, e.g. nightmares, hallucinations, paranoid delusions, were examined, those receiving diaries had much lower levels of PTSD-related symptoms compared to those who did not (Mann-Whitney U, p = 0.028).

CONCLUSION. This study suggests that patients receiving an ICU diary have lower levels of PTSD-related symptoms. The diary may facilitate the working through of traumatic memories, particularly of delusions and be acting like a natural cognitive behavioural therapy. There is a need to perform an RCT of the impact of ICU diaries on psychological recovery.

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0548

DIPEx: PATIENTS’ EXPERIENCES OF INTENSIVE CARE, WWW.DIPEX.ORG

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INTRODUCTION. Most qualitative studies on patients’ experiences of intensive care have focussed on fairly small numbers of patients who have experienced specific problems, such as problems with mechanical ventilation, with communication or with a specific condition. Very little qualitative research has focused on larger numbers of patients or on their entire experience, from admission to recovery. The DIPEx charity, based at the University of Oxford, runs an award-winning multimedia website based on qualitative interview studies about patients' experiences of health and illness. Interview clips from patients are available in video, audio and written formats. The DIPEx intensive care study, funded by ICNARC, aimed to identify the things that mattered to patients who were admitted to intensive care.

METHODS. 40 qualitative interviews were conducted across the UK in 2005 and analysed.

RESULTS. The interviews detailed different aspects of patients’ individual experiences, including: reasons for admission, coming round in intensive care, experiences in ICU and on a general ward, nursing care, physical and emotional recovery, information needs, support, and affects on daily life. 25 main topics from the interviews were illustrated with extracts in written, audio and video format.

CONCLUSION. DIPEx aims to identify the questions that matter to people when they are ill and is widely used to inform patients, educate healthcare professionals, and provide a patient-centred perspective to researchers and those who manage health services. The DIPEx intensive care site linked patients’ experiences with evidence-based information and with a range of other useful resources, including support groups and links to other websites.

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0549

PATIENT EMPOWERMENT IN INTENSIVE CARE

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INTRODUCTION. Intensive care patients often experience a lack of control and inner chaos (1). Experiences from intensive care may affect the patients for a long time. The aim of this study was to describe patient empowerment in an intensive care situation. Patient empowerment is usually discussed from the point of view of participation in health care decisions. This study, however, emanated from a more wide perspective where even experiences of increased strength and power were reflected.

METHODS. The study was based on open-ended interviews with eleven patients in two intensive care units (ICU). The interviews were analysed according to a phenomenological method (2).

RESULTS. All respondents related their experiences of strength and power in ICU situations to their ability to maintain their own inherent joy of life and will to fight, which was said to be of essential importance for their recovery. A positive environment that encouraged feelings of value and motivation, where the patient felt safe, received additional care and participation as he/she wished, had a positive influence. Having a human being, i.e. a next of kin or staff, close by made the patient feel safe as well as informed, if it provided answers to questions or wonderings, facilitated comprehension or prepared for coming changes. It was essential for the patient to feel that someone really cared and to receive confirmation that he/she was important as a person. The patient needed to be taken seriously and be listened to, but found it natural to leave medical decisions and treatment principals to the professionals.

CONCLUSION. The importance of strengthening and stimulating the ICU patients’ own inherent joy of life and will to fight emphasizes the need of personal care based on a close communication with the patient and his/her next of kin. Time has to be invested in communicating with the patient and family in order to find out what is important for each patient.

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A questionnaire was sent to nurses who had taken the course and worked in the medical emergency ward during the first 6 months after the establishment of the MET. Questions asked included the opinion about the course in general, if they felt they had benefitted from the course, if they felt a need for a follow-up course, if the MEWS was easy to use and their opinion about the effects of the establishment of the MET on the cooperation between the ICU and the general ward.

METHODS. A questionnaire was sent to nurses who had taken the course and worked in the medical emergency ward during the first 6 months after the establishment of the MET. Questions asked included the opinion about the course in general, if they felt they had benefitted from the course, if they felt a need for a follow-up course, if the MEWS was easy to use and their opinion about the effects of the establishment of the MET on the cooperation between the ICU and the general ward.

RESULTS. 82% of the nurses answered the questionnaire. All nurses who had taken the course felt the course to be useful and made them more confident when assessing patients. 87% felt a need for a follow-up course once or twice a year. 81% found MEWS to be easy to use and a useful tool. 56% used the MEWS regularly. 92% felt that the cooperation between the ICU and the ward had improved after the establishment of the MET. 100% found the establishment to be positive and wanted the project to continue.

CONCLUSION. In the survey we found that nurses highly appreciated a one-day course prior to establishment of a MET and that the cooperation between the medical emergency ward and the ICU improved after establishment. A primary purpose of establishing METs is earlier detection and treatment of acute respiratory failure and the early detection is a key factor. A close cooperation between general wards and the ICU is important in order to achieve this. We believe that providing a course similar to ours and introducing a scoring scale improve the assessment of patients and the cooperation between general wards and the ICU. We also hope to transfer the benefit of knowledge between the ICU and the ward to be an important span-off effect of the establishment of a MET.

INTRODUCTION. Noninvasive ventilation (NIV) has been increasingly used over the past decade in the management of acute or chronic respiratory failure and weaning of mechanical ventilation. We performed this clinical study to evaluate the usefulness of NPPV in patients who developed acute respiratory failure or post-extubation respiratory failure.

METHODS. We analysed thirty four patients (sixteen males and eighteen females, mean ages 58 years) who applied NPPV (BiPAP S/T, Respironics co., USA) for respiratory failure or weaning difficulty at medical intensive care unit (MICU), emergency room and general ward of a tertiary hospital. We evaluated the underlying causes of respiratory failure, duration of treatment, the degree of adaptation, complication and predictive parameters of successful outcome.

RESULTS. The overall success rate of NPPV was seventy-one percent. The duration of NPPV application time, baseline blood pressure, pulse rate, respiratory rate, PaO2, PaCO2, SaO2 were not different between success group and failure group. But, the baseline pH was higher in the success group. Predictors of success were higher baseline pH, patients with underlying disease of COPD, improvement of vital sign and arterial blood gas value after NPPV application. The success rate in patients with post-extubation respiratory failure was eighty percent. There were no serious complication on applying NPPV except minor complications such as facial skin erythema, abdominal distension and dry mouth.

CONCLUSION. NPPV may be effective treatment in patients with acute respiratory failure or post-extubation respiratory failure in selected cases.

INTRODUCTION. We evaluated the underlying causes of respiratory failure, duration of treatment, the degree of adaptation, complication and predictive parameters of successful outcome.

RESULTS. We have studied 1682 patients, 153 with GCS:3-8, 263 with GCS:9-13 and 1265 with GCS:14-15 points. Average of patient age was 69.1 years (95% CI: 67.5 to 70.6). The most frequent cause of ARF was ARDS (31.2%), heart failure (24.4%), pneumonia (11.8%) and post-traumatic (10.6%). Mortality was 40 (26.1%) in coma patients, 65 (24.6%) in GCS: 9-13, and 390 (30.8%) in patients with GCS:14-15 points. Average of patient age was 69.1 years (95% CI: 67.5 to 70.6).

CONCLUSION. The use of non invasive ventilation (NIV) is controversial in patients with acute respiratory failure (ARF) and do not intubate order (DNI). Despite this, different observational studies find a high success rate with NIV and DNI orders. The aim of this study is to evaluate NIV effectiveness by analysing hospital mortality and one year survival.

METHODS. Prospective observational study including all the patients staying at the ICU from January 1997 to December 2004 with ARF diagnose and NIV required. The indication for NIV was dyspnea, respiratory rate > 30, PaO2/FiO2 < 200, pH < 7.35 or respiratory accessory muscular activity. The variables are expressed as mean ± standard deviation or as percentages. The comparison between the variables was made with J2 Student T test. The survival analysis after one year was done by means of log rank test. The variables associated to mortality were analysed by multivariate analysis.

RESULTS. During the period of the study, 1598 patients were admitted, of whom 429 (26.8%) showed DNI. The most frequent DNI causes were respiratory disease (56.4%) and advanced cardiac failure (17.9%). The mode of ventilation was BiPAP for 96.8% of the patients. DNI was more frequent in women than in men (31% vs 24%; p<0.001). Patients with DNI were older (74±12 vs 67±14 years; p<0.001) and with a higher severity score (SAPSII: 49±15 vs 42±13; p<0.001). PaCO2 (66±25 vs 61±24; p<0.001) and pHs (7.27±0.11 vs 7.29±0.11; p=0.003) levels were different among the patients at NIV start but neither were the ratio PaO2/FiO2 (153±57 vs 152±42; p=0.699) nor respiratory rate (39±6.7 vs 38±6.7; p=0.834). NIV duration was higher DNI patients (43.7±35.8 vs 29.1±28.3 hours; p<0.001). Hospital mortality was 57.1% for DNI and 19.0% for those which did not require DNI order (p<0.001). Variables associated to hospital rate were: SAPSII (OR:1.02; 95% CI:1.01 to 1.04; p=0.001); DNI order (OR:6.52, 95% CI:4.56 to 9.33, p<0.001); Age (OR:1.02; 95% CI:1.01 to 1.03; p<0.001); Admission from emergency room (OR:0.68, 95% CI: 0.52 to 0.99; P=0.024); PaCO2 before NIV (OR:0.98, 95% CI:0.97 to 0.99, p=0.001); PaO2/FiO2 before-NIV (OR:0.99, 95% CI:0.98 to 1.00; p=0.037); PaO2/FiO2 hours-NIV (OR:0.98, 95% CI:0.97 to 0.99, p=0.001); RR hour-NIV (OR:1.07, 95% CI:1.03 to 1.10, p=0.001); SOFA maximum (OR:1.31, 95% CI:1.26 to 1.37, p<0.001); Number complications NIV (OR:1.37, 95% CI:1.15 to 1.62, p<0.001). One year mortality was 68.5% with survival mean of 143 days in the DNI group and 25.0% with survival mean of 289 days (p<0.0001) in non DNI group.

CONCLUSION. NIV order presence is a determining factor for poor prognosis in ARF patients. Despite this, NIV effectiveness rate is high and its use with this kind of patients could be considered.

CONCLUSION. We concluded that neurologic affection secondary to gas exchange disturb in patients with ARF does not influence the results of NPPV therapy.
0554
NONINVASIVE VENTILATION IN ACUTE RESPIRATORY FAILURE SECONDARY TO SEVERE PNEUMONIA
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INTRODUCTION. Noninvasive ventilation (NIV) has demonstrated to be useful, to reduce the need for intubation and mortality in COPD patients with acute exacerbation. However, in other forms of acute respiratory failure (ARF), NIV still remains controversial.

METHODS. Prospective and observational study, with all patients admitted in ICU with pneumonia and treated with NIV between 1997 and 2004. The indication for NIV was dyspnea, respiratory rate >30, PaO2/FiO2 <200, pH <7.35 or activity of accessory respiratory musculature. The primary goal of the study was to determine the success of NIV (defined as a response to therapy allowing the patient to avoid endotracheal intubation, and to survive a stay in the ICU and at least 24 hours on a medical ward). The secondary goal of the study was to identify the variables that can predict a failure of NIV therapy and hospital mortality. The comparison between variables was realized by J2 Pearson and Student’s T test for independent and matched data. Variables correlated to NIV failure and mortality were analyzed by logistic regression.

RESULTS. 235 patients with pneumonia and NIV were admitted to the ICU. The age was 65±17 years, SAPS II was 46±16 and 75% were men. Ninety six patients were diagnosed of COPD (40.9%), 67 (28.5%) of diabetes mellitus and 31 presented neoplastic disease. In 21.1% of cases were specific not intubate orders (DNI). The origin of pneumonia was community in 173 patients and in the rest was nosocomial. Uppulmonary affection was present in 66.8% of the patients and multibloral affection in 50.2%. In 97% of patients were treated by BiPAP mode, 87.7% were treated by VISION ventilator and the rest were treated by BIPAP ST-D ventilator. The evolution of respiratory parameters before starting NIV and after one hour of therapy, showed: PaO2/FiO2: 128±64 and 166±40 (p<0.001), PaCO2: 51.4±22.9 and 47.8±18.7 (p<0.001), Respiratory rate: 36±6 and 32.5±4 (p<0.001) and pH: 7.33±0.12 and 7.34±0.08 (p<0.05). NIV was success in 129 patients (54.9%) and hospital mortality was 39.1%.

TABLE 1. Variables related with NIV Failure

| Variables related | OR    | 95% CI | p-value |
|------------------|-------|--------|---------|
| Multibloral pneumonia | 2.77  | 1.02 7.49 | 0.044   |
| Increased radiologic | 18.94 | 6.48 55.38 | <0.001 |
| Vision vs BiPAP STD | 10.28 | 2.04 51.80 | 0.005   |
| RR after 1 hour-NIV | 1.18  | 1.06 1.31 | 0.002   |
| PaO2/FiO2 before NIV | 0.96  | 0.93 0.98 | <0.003  |
| PaO2/FiO2 1 hour-NIV | 0.94  | 0.92 0.97 | <0.001  |
| SOFA maximus | 1.45  | 1.23 1.72 | <0.001  |

TABLE 2. Variables related Hospital mortality

| Variables related | OR    | 95% CI | p-value |
|------------------|-------|--------|---------|
| DNI order | 8.43  | 2.55 27.81 | 0.002   |
| NIV success | 0.05  | 0.01 0.19  | <0.001  |
| Age | 1.05  | 1.02 1.09  | <0.001  |
| SOFA maximus | 1.38  | 1.18 1.61 | 0.024   |

CONCLUSION. Half of the patients with pneumonia present lack of response to NIV therapy. Respiratory parameters after one hour of NIV and the severity of the patients are factors correlated to worse prognosis. The use of some kind of ventilators is also a determining factor for NIV failure.

0555
EFFECTS OF ICU VS NON ICU VENTILATORS ON REBREATHING DURING HELMET VENTILATION
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INTRODUCTION. Although effective in providing non-invasive ventilation with better patient comfort and less side-effect, the use of the helmet to deliver pressure support ventilation (PSV) and continuous positive airway pressure (CPAP) is complicated by carbon dioxide (CO2) re-breathing. In the present study we tested the hypothesis that turbine-based ventilators with single circuit might improve the carbon dioxide wash-out during CPAP and PSV provided by helmet.

METHODS. Non intentional air leaks, respiratory rate (RR), tidal volume (Vt) [pneumograph], inspiratory carbon dioxide (ICO2) and end-tidal respiratory carbon dioxide (ETCO2) [side-stream CO2 analyzer] were measured in ten healthy volunteers wearing a helmet (StarMed, Italy) during CPAP and PSV delivered by a intensive care unit (ICU) ventilator [Evita 4, Draeger, Germany] through a double inspiratory circuit, and by two turbine-based ventilators [Blupal Vision, Respirtronics, PA and Supportut, Airox, France] through a single inspiratory circuit equipped with a distally occluded plateaus valve (Respirtronics, PA) applied at the expiratory port of the hood.

RESULTS. The non intentional air leak rate was small and similar in all conditions (always less than 3L/min). Other results are expressed in the table.

TABLE 1. Parameters before starting NIV and after one hour of therapy, showed: PaO2/FiO2: 128±64 and 166±40 (p<0.001), PaCO2: 51.4±22.9 and 47.8±18.7 (p<0.001), Respiratory rate: 36±6 and 32.5±4 (p<0.001) and pH: 7.33±0.12 and 7.34±0.08 (p<0.05). NIV was success in 129 patients (54.9%) and hospital mortality was 39.1%.

| Parameters | ICU | Non ICU |
|------------|-----|---------|
| PaO2/FiO2  | 128±64 | 166±40 |
| PaCO2      | 51.4±22.9 | 47.8±18.7 |
| RR         | 36±6 | 32.5±4 |
| pH         | 7.33±0.12 | 7.34±0.08 |

CONCLUSION. Our data show that the combination of a turbine-based ventilator with a standard exhalation device at the expiratory access of the helmet is more efficient than an ICU ventilator to decrease CO2 re-breathing during CPAP and PSV delivered by helmet.

0556
HELMET VENTILATION: PRESSURE SUPPORT VS A TIME-CYCLED ASSISTED MODE IN A HUMAN MODEL
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INTRODUCTION. In patients with acute respiratory failure (ARF) the use of a helmet to deliver pressure support ventilation (PSV) has proved to be effective in improving gas exchange with better tolerance than mask ventilation. However, use of the helmet to deliver PSV worsened patient-ventilator synchrony, efficacy of ventilation to unload the respiratory muscles as compared to mask PSV due to the mechanical characteristics of the helmet and the peculiar algorithms governing PSV triggers. In the present study we tested the hypothesis that pressure targeted Synchronized Intermittent Mandatory Ventilation (P-SIMV) optimizes mechanical assistance and efficacy of ventilation to unload the respiratory muscles during non-invasive ventilation delivered through the helmet.

METHODS. Respiratory rate (RR), tidal volume (Vt), pressure-time product for the diaphragm over 1 min (PTPdi/min), the percentage of inspiratory time spent at nominal PSV level (% IA), triggering delay (the time from onset of inspiratory effort to the beginning of detectable pressurization) were measured in 6 healthy volunteers during PSV and P-SIMV delivered through a helmet. Modes of ventilation were randomly applied. All experiments were conducted with 10 cmH2O of pressure assistance and 5 cmH2O of PEEP. RR of P-SIMV were matched with that obtained during a previous mask PSV trial set at the same pressure parameters. To simulate conditions of increased ventilatory requirements a fixed resistor was placed at the airway opening. An Evita 4 ventilator (Draeger, Germany) was used.

RESULTS. Results are expressed in the table.

| Parameters | P-SIMV | PSV |
|------------|--------|-----|
| Vt (l)     | 0.64±0.24 | 0.45±0.19 |
| RR (b/min) | 14.20±1.79 | 15.8±3.77 |
| % IA       | 58.57±19.06 | 6.4±4.89 |
| Delay (s)  | 0.38±0.13  | 0.74±0.17 |
| PTPdi/min  | 58.35±69.37 | 125.16±55.48 |

CONCLUSION. Our data show that as compared to PSV, P-SIMV increases the level of mechanical assistance, unloads the respiratory muscles and improves patient-ventilator coupling.
0557  
BENCH TESTING OF ICU VENTILATORS FOR HELMET NON INVASIVE VENTILATION
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INTRODUCTION. Helmet is a recent interface for non invasive ventilation. However, its large dead space may increase the work of breathing and delay response to patient’s inspiratory (1). Little is known of the ability of the recent ventilators to pressurise this interface. The aim of the study was to compare, on a lung bench test, new ventilators in terms of pressurisation, triggering and perceived noise during ventilation.

METHODS. Five ventilators were tested in Pressure Support Ventilation (PSV) using a helmet interface (Starmed, Miranda, Italy) on a manikin: EVITA XL (Dräger, Germany), PB480 (Tyco, USA), ELISEE350 (RISMED, Savigny-le-Temple, France), AVEA (Bird, USA), SERVO I (Siemens, Germany). To simulate spontaneous ventilation we used an active lung bench test (two chamber Michigan test lung), to simulate 3 effort levels (low, moderate, high). Noise was recorded by a noise dosimeter (Quest Noise pro DLX) with and without Heat and Moisture Exchanger (HME). The pertinent variables were the delay between effort and inspiration (Delta T), the Pressure-Time Product at 0.5 s (which reflects pressurisation), and the noise level. Results are reported as mean (+/- SD). These characteristics are compared to the same protocol via a standard face mask.

RESULTS. PSV evaluation was performed with 2 levels of Pressure Support (10 and 20 cmH2O) at peak 8 for 3 levels of effort. Main results of study are reported in the table.

|          | Delta T | PTP at 0.5 s | max noise (dBA) | max noise (dBA) |
|----------|---------|--------------|-----------------|-----------------|
|          |         | no HME       | with HME        |                 |
| AVEA     | 170 ± 15| 0.08 ± 0.03  | 100.0           | 90.0            |
| PB480    | 80 ± 0.5| 2.77 ± 0.02  | 104.0           | 85.0            |
| ELISEE350| 120 ± 0.6| 0.51 ± 0.03  | 84.6            | 78.7            |
| SERVO I  | 73 ± 3   | 1.88 ± 0.03  | 97.6            | 80.9            |
| EVITA XL | 141 ± 5  | 2.03 ± 0.05  | 79.0            | 75.0            |
| Face mask EVIDA | 68 ± 2 | 4.08 ± 0.02  | 60.2            | 60.2            |

CONCLUSION. Our study reports that large variations exist among the tested ventilators. In terms of trigger, pressurisation and noise. Clinical efficiency and safety of these ventilators may therefore be different and need to be assessed.

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0558  
NONINVASIVE PROPORTIONAL ASSIST VENTILATION (PAV) FOR PATIENTS WITH CARDIOGENIC PULMONARY EDEMA
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INTRODUCTION. During past years one can observe increase in use of noninvasive ventilation (NIV) (1). Acute respiratory failure (ARF) due to cardiogenic pulmonary oedema (CPO) is typical indication for NIV.

METHODS. In our preliminary study we studied 8 pts with ARF due to CPO ventilated noninvasively with PAV using total face mask. For PAV we selected following settings: Volume assist=25 cmH2O/L, Flow Assist=4 cmH2O/L, S/PEEP 5, S/PEEP 10, S/PEEP 15. After 30 min FIO2 was reduced to 4%. PaO2, PaCO2, pH, saturation were measured and dyspnoea was estimated before and every 30 minutes of ventilation.

RESULTS. PaO2 values before and during PAV are shown in the figure. Mean ventilation time was 4 hours.

CONCLUSION. In pts with ARF due to CPO noninvasive PAV is: 1) effective and well tolerated, 2) there is no need for sedation and no risk of prolonged weaning from ventilation.

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0559  
CAN NONINVASIVE POSITIVE PRESSURE VENTILATION WITH CAUSE A DELAY IN INTUBATION?
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INTRODUCTION. The present randomized controlled study aims to determine efficacy of NPPV and its effects upon intubation rate and mortality in ARDS.

METHODS. This study was performed on patients over 18 in the respiratory intensive care unit at University Hospital. 20 patients meeting the American-European diagnostic criteria for ARDS were included in the study. The patients were respectively randomized and then divided into two groups: standard therapy group and NPPV group. Invasive mechanic ventilation indications were determined before the study was begun. Any patient meeting the criteria of intubation was immediately intubated in either group. On the other hand, those not needing immediate intubation underwent a standard medical treatment. In the NPPV group, patients needing intubation received NPPV in addition to a medical therapy.

RESULTS. 17 patients were male. A total of 18 patients (90%) were followed as pulmonary ARDS. The mean age was 45.2±19.7 year. The mean PaO2/FiO2 was 106.6±mmHg, and the mean APACHE II score was 18.7±2 in all ARDS patients. The mean survival for all patients was 65%. Eight patients in the standard treatment group and three patients in NPPV group need urgent intubation. Seven patients in the NPPV group received NPPV via a full-face mask. The mean EPAP was 9.6±cmH2O (range 7-12) and IPAP was 17.4±cmH2O (range 14-22). NPPV was successful in 4 patients (57%), but the other three patients needed intubation due to failure of NPPV. The duration of NPPV, age, admission APACHE II score and admission PaO2/FiO2 ratio were not dissimilar in the two groups. However, there was a statistical difference between PaO2/FiO2 ratios at 24th hour regarding the standard therapy and NPPV group (193.0±93.3 mmHg, with p=0.003). Immediate intubation was needed in three patients who failed to respond to NPPV. These three patients subsequently died.

CONCLUSION. While 8 of the patients in the standard group received intubation, the number of patients having received intubation in the NPPV group was 6. Also, while 3 patients died in the NPPV group, this number was 4 in the other group. The fact that all the 3 patients failing to respond to NPPV died afterwards led us to conclude that NPPV could have delayed intubation in ARDS patients. We, therefore, suggest that the first 24 hours should be accepted as reference, and that a patient who fails to benefit from NPPV should be intubated without delay.

REFERENCE(S).

0560  
COMPARISON OF TWO NON-INVASIVE CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP) VENTILATION SYSTEMS
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INTRODUCTION. The traditional way to produce CPAP is to use a flow generator together with spring-loaded expiratory pressure valves (8). In the Boussignac-CPAP a virtual valve is created by air-flow injected via micro-channels (8). We have compared these two CPAP systems in terms of breathing pattern and respiratory mechanics in eight healthy volunteers.

METHODS. Subjects were studied in the sitting position in two separate days with different masks. Esophageal and gastric pressures were measured by two separate catheters. Airway pressure was measured by a small tube fitted to the face mask. A respiratory inductive plethysmograph was used to measure respiratory volume. Both sessions included three five-minute periods of CPAP with different positive end expiratory pressure (PEEP) levels in randomized order. Mean airway pressure (Paw), tidal volume (VT), respiratory rate (RR), dynamic chest wall compliance (CcW, dyn) and PEEP induced increase in functional residual capacity (/AFRC) were compared between masks.

RESULTS. VT and RR differed between CPAP systems (Table 1). Increases in FRC levels were similar with both systems.

| TABLE 1. | R/PEEP 5 | S/PEEP 5 | R/PEEP 10 | S/PEEP 10 | R/PEEP 15 | S/PEEP 15 |
|----------|----------|----------|----------|----------|----------|----------|
| Paw (cmH2O) | 5.4±0.2 | 6.1±1.0 | 10.2±0.3* | 11.1±0.8 | 15.3±0.9 | 15.3±0.9 |
| VT (ml) | 259±197* | 443±230 | 246±185* | 590±259 | 229±92* | 593±326 |
| RR (brepm) | 15.2±3.8* | 12.1±3.9 | 14.4±3.7 | 11.6±5.6 | 15.9±4.7 | 12.7±6.7 |
| CcW, dyn | 71±40 | 124±52 | 59±18* | 197±112 | 73±63 | 153±151 |
| /AFRC (ml/cmH2O) | 1515±274 | 272±196 | 1774±387 | 590±364 | 879±455 | 614±84 |

Data presented as mean ± SD. * p<0.05 paired T-test

CONCLUSION. Although both CPAP systems have almost similar effect on FRC they affect breathing pattern differently. This phenomenon must be studied further.

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0561
SUBJECT-VENTILATOR SYNCHRONY DURING NEURAL VS. PRESSURE TRIGGERED NON-INVASIVE HELMET VENTILATION

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INTRODUCTION. In non-invasive ventilation (NIV) delivered by a helmet, triggering is delayed when conventional pneumatic triggers are used [1]. The use of neural triggering and neural cycling-off - using the diaphragm electrical activity (EAdi) - should reduce in- and expiratory trigger delays and improve patient-ventilator synchrony.

METHODS. For NIV a Castar-“R” helmet (Starmed, Italy) was used. Trigger delays during onset (Delay-on) and offset (Delay-off) and the occurrence of wasted inspiratory efforts were determined during pressure support ventilation (PSV), using pneumatic trigger/cycling-off (PT = pressure trigger -1.3±0.6 cm H2O, flow cycling off at 5% of peak inspiratory flow) or neural trigger/cycling-off (NT = trigger on rise in EAdi and cycle off at 60% of peak EAdi). 7 healthy subjects were studied during various combinations of PSV (5, 10, and 20 cmH2O) and breathing frequencies (BF= 10, 20, and 30 bpm). The subjects were coached to keep the EAdi at >50% of voluntary maximum and not use expiratory muscles.

RESULTS. Delay-on was significantly longer with PT than with NT for all combinations of BF and PSV levels with differences between means ranging from 181 ms to 387 ms. Delay-off was 191 ms at PSV of 5 cmH2O and BF of 10 and increased to 1591 ms during PSV of 20 cmH2O and BF of 30 bpm, the difference between means reached significance at all BF level during PS of 20 cm H2O. The amount of wasted inspiratory efforts (expressed in percent of neural efforts) during PT was 0% at all PSV levels with BF of 10 bpm and increased with increasing levels of PS and BF to 46% at BF of 30 bpm and PSV of 20 cmH2O. No wasted efforts occurred during NT.

CONCLUSION. The present study demonstrates that, independent of the level of ventilatory assist and breathing frequency, neural triggering and cycling-off improves subject-ventilator synchrony during PSV with helmet interface compared to conventional pressure trigger and flow cycling-off.

REFERENCE(s). Moerer O, et al. Intensive Care Medicine 2004; 30:67-A248.

0562
INCREASED MORTALITY AFTER FAILED THERAPY WITH NIV IN ACUTE HYPOXEMIC RESPIRATORY FAILURE

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INTRODUCTION. Non-invasive ventilation (NIV) has been used with some success in acute respiratory failure [1]. In our institution a trial of NIV outside ITU is a therapeutic option delivered by a patient-at-risk team.

METHODS. We retrospectively studied the impact of NIV failure requiring ITU admission on the subsequent clinical course and outcome. Patients admitted to ITU with similar diagnoses without prior NIV trial served as controls. Statistics: Median and interquartile ranges for continuous data, Mann-Whitney U test and chi-squared test for statistical comparisons; alpha-level 0.05.

RESULTS. Over an 18-months period 41 patients received NIV for 1 (0-2) days prior to ITU admission. Maximum PEEP level and FiO2 were 5.0 (5.0-7.5) mbar and 0.65 (0.6-0.85) respectively.

TABLE 1. Patient demographics, severity scores, expected and observed mortality

| NIV group (n=41) | Controls (n=97) | P-value |
|-----------------|----------------|---------|
| Age [years]     | 57.0 (47.8-72.5) | 63.0 (52.7-74.0) | n.s. |
| Hosp days pre ITU | 8.0 (2.0-14.8)  | 5.0 (1.0-16.2) | n.s. |
| ITU days        | 9.0 (2.0-14.0)  | 5.0 (1.0-16.20) | n.s. |
| APACHE II score | 24.0 (20.8-28.2) | 21.0 (18.0-27) | 0.04 |
| SAPS II score   | 50.0 (41.0-61.2) | 45.0 (38.0-55.0) | n.s. |
| APACHE II predicted mortality [%] | 48.1 (37.5-63.6) | 38.9 (26.2-57.5) | 0.02 |
| SAPS II predicted mortality [%] | 46.1 (26.6-70.5) | 34.7 (21.3-57.5) | n.s. |
| Hospital mortality [%] | 65.8 | 42.7 | 0.013 |

CONCLUSION. NIV failure was associated with a significant increase in mortality in the absence of discernible differences in case mix or demographics and in the face of only subtle differences in severity scores.

REFERENCE(s). BTS Standards of Care Committee. Non-invasive ventilation in acute respiratory failure. Thorax 2002; 57: 192-211.

0564
CONVENTIONAL VS NON-INVASIVE VENTILATION IN ACUTE RESPIRATORY FAILURE

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INTRODUCTION. NIV using BIPAP can be a safe alternative and effective means of improving gas exchange, avoiding incidence of complications associated with invasive MV & decreasing LOS, when treating patients with ARF.

METHODS. 50patients with ARF (type and typeII) were enrolled in the study. -4 into groups. Group 1:patients were subjected to invasive MV & Group2:patients were subjected to BIPAP. Both groups were compared regarding:ABG (on admission,30 min,60 min after initiating MV & once daily), Ccr & resistance measured at day1 & day2, complications (VAP, skin necrosis & CO2 narcosis).
The study aimed to find out the predictors of successful NIV through multivariate analysis.

RESULTS. The application of BIPAP as compared with invasive MV was associated with similar improvement in ABG data at 30 min & at discharge, significant difference change in compliance & resistance from day1/day2 and significantly lower incidence in VAP (20% vs 80%, P=0.002), shorter duration of MV (3.6±3 vs 6.5±5 days, P=0.006), shorter LOS (5.8±3 vs 8.9±2.7 days, P=0.011). Skin necrosis, CO2 narcosis occurred only in NIV group with (50% & 20%, respectively). Improvement of PCO2 after 1/2 hours of initiation of ventilation proved to be the sole predictor of successful NIV with 100% specificity.

TABLE 1. ABG data at 30min & discharge

| gp I | gp II | P-value |
|----|----|---------|
| pH | 7.31±0.02 | 7.33±0.03 | 0.20 | 7.42±0.04 | 7.42±0.03 | 0.79 |
| Pco2 | 65.55±12.68 | 65.71±13.29 | 0.97 | 51.34±7.22 | 50.21±5.99 | 0.67 |
| Po2 | 93.8±6.41 | 95.0±6.28 | 0.89 | 67.25±5.13 | 68.96±11.38 | 0.36 |
| Po2/Fio2 | 184.92±19.96 | 198.94±14.00 | 0.50 | 32.71±23.89 | 32.71±23.78 | 0.76 |

CONCLUSION. NIV was as effective as conventional improvement in ventilation gas exchange, associated with fewer serious complications & shorter LOS. 1/2 hour trial can predict success with BIPAP, as shown by an improvement in pH, Pco2 & overall clinical picture. PCO2 after 1/2 hour could be the sole predictor of successful NIV with 100% specificity.
0565
SENSITIVE EARLY MARKERS OF SEVERITY AND OUTCOME IN SEPSIS
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INTRODUCTION. The aim of the present study was to investigate which biomarkers reliably assess severity and mortality early in the sepsis process.

METHODS. In 47 critically-ill patients within the 24 h of septic onset, Interleukins (IL)-8, -12p70, -6, -10, and -12p70; tumor necrosis factor-alpha (TNF-alpha), procalcitonin (PCT) and C-reactive protein (CRP) were measured in serum. Additionally, CD64 expression was measured in neutrophils.

RESULTS. In early sepsis, neutrophil CD64 expression and IL-8 levels are the only biomarkers that increased with sepsis severity, fully differentiating disease stages: sepsis, severe sepsis and septic shock (p<0.001). The biomarkers that best evaluate the severity of sepsis, as assessed by APACHE II score, were CD64, IL-8 and IL-6 (p<0.01), and those that best evaluate organ failure severity, as assessed by SOFA score, were CD64 and IL-8 (p<0.01). CD64 expression and IL-8 levels were associated with mortality within 28-days (OR=1.3, p=0.01 for CD64 and OR=1.26, p=0.024 for IL-8 by logistic regression analysis).

CONCLUSION. There is an early increase of neutrophil CD64 expression and IL-8 levels during sepsis. Based on this single measurement it is possible to reliably assess the stage, detect the severity and predict the 28-day mortality of sepsis.

0566
C-REACTIVE PROTEIN AND ORGAN FAILURE IN SEPTIC PATIENTS.
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INTRODUCTION. Features of sepsis are the result of the inflammation and coagulation leading in severe cases to organ dysfunction. Identifying patients at high risk will permit better allocation of new therapies. We aimed to evaluate the presence of multiple organ failure (MOF) and its correlation with changes in initial CRP serum levels in patients with severe sepsis and septic shock.

METHODS. Prospective analysis of patients with sepsis (March 2003 to November 2005) in a twenty-four-bed ICU. From a total of 564 patients consecutively diagnosed with sepsis, 467 patients with one or more sepsis-induced organ failure (SOFA) and an ICU length of stay higher than 48 hours were evaluated. MOF was considered in the presence of ≥2 organ failures. CRP was evaluated by turbidimetric method.

RESULTS. Patients with MOF had higher APACHE II score (19 ± 8 vs 15 ± 7), higher ICU and hospital length of stay (28.5 ± 19 vs 17.5 ± 12 days; 24.9 ± 21 vs 16.7 ± 16 days, respectively) and significantly higher mortality rates (65.5% vs 50%, RR 1.31 IC 95% 1.07 - 1.59) than patients without MOF (p<0.05 for all). Patients who presented MOF had higher CRP levels on day 3 (19 ± 4 mg/dl) and on day 4 (16 ± 10 mg/dl) in comparison to those without MOF (15 ± 9.4 and 12.9 ± 8.5 mg/dl) (p<0.05 for both).

CONCLUSION. Patients with severe sepsis and septic shock had similar CRP serum levels in the first 48 hours of sepsis. Thereafter serum CRP concentrations had a slower decrease in patients with MOF than in patients without MOF.

0567
KINETICS AND INTERACTIONS BETWEEN PLASMA SELENIUM LEVELS, SIRS, SEPSIS AND MULTIORGAN FAILURE.
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INTRODUCTION. The possible interactions between plasma selenium levels and systemic inflammatory response syndrome (SIRS), sepsis, and organ dysfunction/failure are not well characterized. We investigated the relation of plasma selenium levels in critically ill patients to the presence of SIRS, organ dysfunction/failure, infection, and their time course.

METHODS. Fifteen patients were included in each of four a-priori-defined subgroups: ICU controls (no SIRS group); uncomplicated SIRS group, fulfilling SIRS criteria without any underlying infection or associated organ failure; severe SIRS group defined as established SIRS with accompanying organ failure; and patients with a diagnosis of severe sepsis/septic shock. Plasma selenium and laboratory indices of organ dysfunction/failure, markers of tissue inflammation and infection were measured daily during the ICU stay.

RESULTS. A total of 60 patients were included, 47 (78%) of whom were admitted after a cardiac procedure. Fifty-five patients (92%) had plasma selenium levels less than the standard values for healthy subjects (74 µg/L). Selenium levels decreased significantly during the ICU stay in all groups, except for patients without SIRS, to a minimum value that was more pronounced in the presence of organ failure, and especially with both organ failure and infection (SIRS, severe SIRS, and severe sepsis: 51.2 ± 12.9, 37.6 ± 7.9, and 23 ± 8.7 µg/L, respectively, p<0.01). The minimum plasma selenium concentration was inversely correlated to the maximum leukocyte count (rs = -0.47), the maximum serum CRP (rs = -0.53), the maximum serum PCT (rs = -0.55), the maximum serum IL-6 (rs = -0.65), the maximal degree of organ dysfunction/failure during the ICU stay as assessed by the maximum SOFA score (rs = -0.65), the maximum serum lactate concentration (rs = -0.62), the maximum total serum bilirubin (rs = -0.43), and the maximum serum creatinine (rs = -0.52). Positive correlations were present between plasma selenium levels and the minimum platelet count (rs = 0.56), the minimum plasma AT III activity (rs = 0.72), and protein C activity (rs = 0.46).

CONCLUSION. In critically ill surgical patients, plasma selenium levels are generally low with a pronounced decrease during the ICU stay in the presence of organ failure especially that attributed to infection. Lower plasma selenium levels are associated with higher degrees of tissue damage, with the presence of infection and/or organ dysfunction/failure.

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0568
THE ROLE OF INFLAMMATORY MEDIATORS FOR TRANSITION BETWEEN SEPSIS, SEVERE SEPSIS AND SEPTIC SHOCK.
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INTRODUCTION. The present study was designed to define the significance of soluble triggering receptor expressed on myeloid cells-1 (sTREM-1) for the transition between stages of sepsis.

METHODS. A prospective study was undertaken in 56 patients with septic syndrome. Blood was sampled at regular time intervals for the estimation of pro- and anti-inflammatory mediators. Concentrations of tumour necrosis factor-alpha (TNFalpha), interleukin-1beta (IL-1b), IL-6, IL-10 and IL-12p70 were measured by immunoenotyping, those of sTREM-1 by an enzymimmunohassay.

RESULTS. Changes of APACHE II between days 1 and 6 were positively correlated to the respective changes of the concentrations of sTREM-1; similar correlations were not found between APACHE II and the other estimated cytokines. Median ratio of IL-10/INF-γ of day 1 was 51.3, 442.6 and 117.5 in patients with sepsis, severe sepsis and septic shock respectively (p<0.05 sepsis vs severe sepsis and severe sepsis vs septic shock). Respective sTREM-1/IL-6 ratio was 1.30, 0.56 and 0.65 (p<0.05 sepsis vs severe sepsis and septic shock). Cox regression analysis revealed that the only significant prognostic factor of survival was the ratio sTREM-1/INF-γ of day 1 (H: 1.00, CI: 1.00-1.01, p: 0.003). Statistically significant correlations were found between IL-10/IL-1 and sTREM-1/IL-6, between IL-10/IL-6 and sTREM-1/IL-6, and between IL-10/IL-12p70 and sTREM-1/IL-12p70 of day 1.

CONCLUSION. sTREM-1 behaves as an anti-inflammatory mediator. Sepsis occurs when the ratio sTREM-1/IL-6 is elevated; increase of IL-10/INF-γ, of sTREM-1/INF-γ and of sTREM-1/IL-12p70 followed by decline of sTREM-1/IL-6 characterized severe sepsis. Whenever all the latter ratios are further decreased, septic shock ensues.
0569
PLASMA ENDOTHELIN-1 LEVELS IN SEPTIC PATIENTS.
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INTRODUCTION. In septic patients there comes to the dysfunction of vascular endothelium. Endothelial dysfunction causes the increase of serum ET-1 concentration. It was assumed that in septic patients ET-1 level correlates with the level of sepsis severity, with the level of organ dysfunction. To estimate the level of sepsis severity procalcitonin and C-reactive protein were used. The Sepsis-related Organ Failure Assessment score was used to estimate multiorgan dysfunction. The aim of the study was to assess the relation between ET-1 levels and procalcitonin, C-reactive protein levels and the sepsis-related organ failure assessment score in septic patients.

METHODS. Twenty patients with sepsis and severe sepsis were included in the study. Blood serum ET-1, PCT and CRP concentrations were determined in each patient at given time intervals and the scores were estimated in the Sepsis-related Organ Failure Assessment score.

RESULTS. In the investigated group, 128 measurements were performed (mean 6.4 in each patient). Mean ET-1, procalcitonin and C-reactive protein concentrations were respectively: 8.39 pg/ml +/- 6.39 pg/ml, 22.32 mg/l +/- 97.41 mg/l, 128.51 mg/l +/- 79.05 mg/l. Correlation of the ET-1 levels and procalcitonin and C-reactive protein levels were 0.358 (p=0.001) and 0.225 (p=0.031), respectively. Mean Sepsis-related Organ Failure Assessment score was 6.31 pts +/- 3.75 pts. Correlation of the ET-1 levels and Sepsis-related Organ Failure Assessment score was 0.470 (p=0.001). Six patients died (30%) from their underlying disease during the observation period of 28 days.

CONCLUSION. Endothelin-1 levels correlate with PCT, CRP levels and Sepsis-related Organ Failure Assessment score in septic patients.

0570
S-100 B IN SEVERE SEPSIS
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INTRODUCTION. High concentration of S100B has been described in cerebrospinal fluid and serum after several disease of Central Nervous System. S100B, which is released from astrocytes to promote neuronal survival and development, exhibits cytokine-like activity and may play a role in systemic inflammatory response. Aim of this study is to evaluate the relationship between S100B and neurological findings in course of sepsis.

METHODS. 16 patients affected by severe sepsis were included. S100B was measured at ICU admission, after 72 hours and at 7 days; normal value is below 0.15 mcg/l. EEG was recorded 72 hours after the diagnosis, if appropriate; Glasgow Coma Scale (GCS) and SOFA score were calculated daily. EEGs findings were classified according the Young score system.

RESULTS. 8 patients out of 16 showed evidence of severe impairment of consciousness. 5 patients showed milder degrees of coma and 3 patients showed agitation and confusion but a normal GCS. Mean S100B serum level was increased in patients with severe sepsis: S100B above 0.15 mcg/l was found in 9 patients. The GCS score did not correlate with the S100B levels. EEGs findings were abnormal in all cases with a large range of inter-individual variability but we didn’t find any correlation between EEG patterns and S100B serum levels.

CONCLUSION. The main finding of this study is that S100B levels are increased in severe sepsis, without a clear relationship with GCS or EEG. Constantly elevated S100B levels might indicate damage in astroglial cells and could be useful in predicting outcomes of SAE patients but it could be also explained as an inflammatory, not specific, reaction of the brain.

REFERENCE(S). Piazza O, Cotena S, Esposito G, De Robertis E, Tufano R. S100B is a sensitive marker of complications in coma patients after cardiac arrest. Minerva Chir. 2005 Dec;60(12):477-80.

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0571
ALBUMIN AND PCT IN PATIENTS WITH SEVERE SEPSIS/SEPTIC SHOCK
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INTRODUCTION. We investigated clinical parameters at ICU admission in patients with severe sepsis or septic shock on admission or during ICU stay. Parameters were analysed for their ability to diagnose and predict septic complications in critically ill patients.

METHODS. A retrospective study was conducted in a 15-bed ICU in a university hospital. Admission values were recorded for 177 patients with severe sepsis or septic shock (SP), according to ACCP/SCCM consensus conference definitions, and 383 consecutive patients without septic periods during ICU stay (NSP). Receiver Operating Characteristic (ROC) analyses and logistic models were performed.

RESULTS. Hospital mortality was significantly higher in SP than in NSP (53.1% vs. 15.1%). Septic complications were present on admission for 78 SP, while 99 patients acquired severe sepsis during ICU stay. For patients admitted with septic complications albumin, PCT and urea were significantly different compared to NSP (AUC >0.8). Regarding prognosis of ICU-acquired septic complications albumin and PCT discriminated best (AUC 0.725 and 0.701, respectively). Prognosis could further be enhanced applying a multivariate logistic model.

TABLE 1.

| Albumin [g/l]   | Cut-off | PCT [mg/l]   | Cut-off |
|-----------------|---------|--------------|---------|
| 19.5 ± 6.5      | > 22    | 6.3 ± 12.0   | > 1     |

REFERENCE(S). American College of Chest Physicians/Society of Critical Care Medicine Consensus Conference. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. Crit Care Med. 1992; 20: 864-74.

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0572
IL-18 AS EARLY MARKER OF SEPSIS
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INTRODUCTION. Markers of mediator and cellular activity have been studied to evaluate the immunological and clinical status of critically ill patients. IL-18 is an immunostimulatory cytokine that promotes TNF-alpha, IL-1beta, IL-8, GM-CSF secretion and IFN-gamma production. Moreover IL-18 induces apoptosis and down-regulates the production of anti-inflammatory cytokines [1]. The aim of this study was to evaluate IL-18 serum levels in septic patients.

METHODS. Ten patients were enrolled in a 4-months study period. Demographic data, SAPS 3, SOFA, C-reactive protein, lactic acid, IL-18, IL-2 and TNF-alfa were measured at the first day of sepsis diagnosis. IL-18, TNF-alfa and IL-2 were quantified by ELISA.

RESULTS. Data are shown in table 1.

| Patient n° | Age (yrs) | SAPS 3 | SOFA | GCS | TNF-alpha (pg/ml) | IL-18 (pg/ml) |
|------------|-----------|--------|------|-----|------------------|---------------|
| 1          | 76        | 72     | 7    | 10  | 16               | 984           |
| 2          | 71        | 76     | 13   | 10  | 26               | 356           |
| 3          | 72        | 64     | 12   | 10  | 32               | 400           |
| 4          | 78        | 80     | 13   | 6   | 31               | 1040          |
| 5          | 59        | 84     | 19   | 4   | 25               | 1860          |
| 6          | 58        | 45     | 9    | 8   | 15.6             | 730           |
| 7          | 63        | 71     | 13   | 8   | 48               | 1040          |
| 8          | 75        | 56     | 5    | 3   | 15.6             | 240           |
| 9          | 44        | 46     | 9    | 12  | 25               | 1630          |
| 10         | 78        | 66     | 9    | 12  | 16               | 340           |

Mean ± SD 67.4 ± 11.14 66 ± 13.44 10.9 ± 3.96 8.11 ± 3.26 25 ± 28.0 10.79 862 ± 5888

CONCLUSION. IL-18 levels are significantly higher in septic patients compared to controls (862±5888 pg/ml vs 182±35.59 pg/ml, p=0.002). Among molecular markers, IL-18 plays an important role in the pathophysiology of sepsis, particularly in the initial phase of the inflammatory response.

REFERENCE(S). 1) Sven K et al. Crit Care Med 2006; 31:1225-1233.
0573  A STANDARDIZED ASSAY TO QUANTITATE NF-κB ACTIVATION CAPACITY IN HUMAN BLOOD CELLS

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INTRODUCTION. The NF-κB pathway is essential for the activation of proinflammatory cells. In septic patients increased activity of the transcription factor NF-κB in mononuclear blood cells (MNC) is known to positively correlate with the Apache II score and lethality and thus may predict the outcome. However, the golden standard to determine NF-κB activity, the electrophoretic mobility shift assay (EMSA), is rather semi-quantitative. Moreover, heterogeneity of peripheral MNCs during sepsis most likely account for inconsistent results as NF-κB is differentially induced in lymphocytes and monocytes. Thus, NF-κB analysis in MNCs via EMSA may not evaluate the role of NF-κB during critical diseases. For this purpose a standardized quantitative assay is necessary.

METHODS. Peripheral MNCs were isolated from 10 healthy volunteers by standardized Ficoll prepa-
tation. T cells were purified via magnetic bead separation and purity was checked by flow cytometry upon CD4 and CD8 labelling. 4*10E6 MNCs and T cells, respectively, were stimulated with 10ng TNFα for 30 minutes. NF-κB activation capacity was determined via EMSA. NF-κB DNA binding activity was used for normalization. Densitometric analysis of autoradiographic band shifts was performed using an image analyzer after exposure for 5 hours. Relative NF-κB induction was calculated: (stimulated NF-κB stimulated NF-κB) / (control NF-κB control NF-κB).

RESULTS. Table shows relative NF-κB induction. NF-κB is clearly inducible in T cells and MNCs. Compared to T cells, NF-κB activation capacity in MNCs is more variable. Hence, depending on the cell population purity, this assay provides an applicable means to quantify the NF-κB activation capacity upon ex vivo stimulation of human peripheral blood cells.

| TABLE 1. Mononuclear cells (n=10) | T cells (n=10) |
|-----------------------------------|--------------|
| Fold change (stimulated vs control) | 2.392 ± 0.41 | 3.73 ± 1.01 |
| Median                            | 3.87         | 3.56         |

CONCLUSION. Differential blood counts are necessary to interpret NF-κB activation in peripheral MNCs. Their varying NF-κB induction compared to T cells suggests that monocytes have heterogeneous activation capacities. Further studies have to show whether the mononuclear NF-κB activation capacity determines the extent of e.g. septic hyperinflammation.

0574  NEUTROPHIL CD64 EXPRESSION CORRELATES WITH THE LEVEL OF PROINFLAMMATORY CYTOKINES IN SEPTIC PATIENTS

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INTRODUCTION. Septis is a serious disease with a high mortality rate. A spectrum of changes in immune response appear in the pathogenesis of sepsis, ranging from harmful hyperinflammation to profound immunodeficient immunopathology. Neutrophil CD64 expression increases as part of the systemic response to severe infection or sepsis. Other proinflammatory and antiinflammatory cytokines (IL1B, IL-6, IL-10) are involved in the pathogenesis of sepsis. The study aimed to determine the importance and feasibility of their evaluation in patients with SIRS, sepsis and septic shock.

METHODS. 67 patients meeting the criteria for the diagnosis of SIRS, sepsis and septic shock according to the Consens conference, were examined. For the determination of granulocyte CD64 expression and HLA-DR on monocytes, flow cytometry was used. Production of TNF-α ex vivo after lipopolysaccharide stimulation was evaluated by VoßBlutstimulat ion Kit (Millenia). The determination of PCT, IL-6, IL-10 were evaluated by use of the chemiluminescence method.

RESULTS. CD64 on granulocytes were significantly lower in patients with SIRS compared to patients with sepsis and septic shock (P<0.0001, resp. P<0.0001). The determination of CD64/45 and HLA-DR on monocytes using MFIs correlated with QuantiBRITE method (r=0.883, resp. 0.739, P<0.0001, resp. P<0.0001). CD64 expression on granulocytes correlates with mediators of systemic inflammation (procalcitonin PCT (r=0.438, P=0.002)); proinflammatory cytokines - interleukin-6 (r=-0.556, P<0.001), lipopolysaccharid binding protein (r=0.446, P=0.002) and also anti-inflammatory cytokines - IL-10 (r=0.422, P<0.003). Monocyte HLA-DR expression correlates with C-reactive protein (r=0.444, P=0.038). The values of expression of HLA-DR correlated significantly with values of TNF-αfa in patients with SIRS and sepsis (P=0.004, resp. P=0.0003). The last measured values of HLA-DR on monocytes and production of TNF-αfa were significantly lower in non-survivals compared to survived (P=0.001, resp. P=0.005).

CONCLUSION. Quantitative CD64 expression on granulocytes, monocyte HLA-DR expression, and production of TNF-αfa ex vivo are useful parameters in long-term monitoring of septic patients and in the context of the clinical status.

0575  CIRCULATING PROGENITOR CELLS IN SEPTIC PATIENTS

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INTRODUCTION. Sepsis is characterized by various organ dysfunctions, including endothelial dam-
age. Circulating progenitor cells (CPC) are thought to serve as a cellular reservoir aimed at replacing dysfunctional injured cells. The objective of our study was to investigate levels of CPCs in patients with sepsis and correlate them with the severity and outcome of infection.

METHODS. 86 patients with sepsis (including 48 in septic shock) on ICU admission were consecu-
tively treated on Day 1. The control group comprised the patients without infection (including three patients with SIRS criteria). Quantification of CPCs was performed on peripheral blood sample using double labelling with anti-CD45 and anti-CD34 monoclonal antibodies on a FACS flow cytometer. In 30 septic patients, CPCs levels were determined again on Day 3.

RESULTS. Day 1 CPCs levels were significantly lower in patients with septic shock as compared to those with SIRS: 0.9 (0.4-1.1) vs 3.3 (1.6-7).T cells/microl., P<0.01. Among patients with sepsis, Day 1 and Day 3 CPCs levels were lower (median value=0) in Day 28 nonsurvivors as compared to survivors although the difference was not significant.

CONCLUSION. There might be a deficit in CPCs mobilisation in septic patients with worse outcome. If confirmed, this hypothesis may have potential therapeutic implications.

0576  OSTEOPONTIN AND H4/ICOS: NEW MARKERS FOR SEPSIS?

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INTRODUCTION. Systemic inflammatory response syndrome (SIRS) is a common syndrome in the intensive care unit that may progress to severe sepsis or septic shock. It is believed that severe sepsis and septic shock are accompanied by the inability to regulate the inflammatory response shown by an imbalance in the pro- and anti-inflammatory response. The aim of this study was to measure potential markers in patients with SIRS, severe sepsis or septic shock that may predict progression of disease and clinical outcome.

METHODS. We measured the level of soluble mediators osteopontin (OPN), IL4, IL5, IL10, TNF-α and INF-γ as well as markers of T-cell activation H4/ICOS, CD69, CD25 and HLA-DR in pa-
tients with SIRS, severe sepsis, septic shock and healthy controls. Additional blood samples were taken when patients progressed to a different stage and when patients recovered and did not meet the criteria defining SIRS.

RESULTS. Plasma OPN levels (ng/ml) were significantly increased in patients with SIRS as com-
pared to healthy controls. In the more severe stages OPN increased further, while levels decreased when patients recovered (see table). No differences were observed in the levels of IL10, TNF-α, INF-γ, IL4 or IL5. In patients, the analysis of the markers of T-cell activation showed an expected increase in levels of CD25, CD69 and HLA-DR as compared to the controls. Levels decreased when patients recovered. Of special interest, levels of H4/ICOS (% positive cells) were increased in patients as compared to controls, however levels continued to increase during the recovery of the septic process.

| TABLE 1. |
|-----------|
|          | Control | SIRS | Severe Sepsis | Septic shock | Sepsis recovery |
| OPN ng/ml| 125 (141±127) | 780 (940±460) | >2500 | >2500 | 607 |
| H4/ICOS | 11 (15±19) | 40 (29±21) | 36 (44±34) | 45 (42±28) | 75 (62±37) |

CONCLUSION. This study suggests that OPN and H4/ICOS may be considered new markers in sep-
sis. OPN appears to correlate with the severity of sepsis and may play a role in the pro-inflammatory response. H4/ICOS positive T-cells are likely part of the anti-inflammatory response and therefore may play a role in the recovery of sepsis. However, more research is needed to establish predictive roles for these markers.

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THE NUMBERS OF BLOOD NEUTROPHILS EXPRESSING TLR4 ARE INCREASED IN PATIENTS WITH GRAM-VE INFECTIONS

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INTRODUCTION. Treatment of patients with sepsis with the most appropriate antibiotics is often delayed because the conventional diagnosis of bacterial infections may take 24-48 hours. In some situations no antibiotics are prescribed in the mistaken belief that the onset of organ failure is non-bacterial. The Toll-like receptors (TLRs) mediate cellular responses to conserved microbial patterns with TLR4 recognising Gram-ve bacteria. Neutrophils actively remove foreign pathogens and although TLR4 is normally absent from blood neutrophils it is upregulated at sites of bacterial infections. The aim of this study was to determine if TLR4 was expressed on circulating neutrophils in patients with known Gram-ve infections.

METHODS. The expression of TLR4 was determined by the flow cytometric analysis of neutrophils in whole blood samples. We investigated 28 ventilated patients in the ICU: 15 sepsis patients with Gram-ve infections, 8 sepsis patients with Gram-ve infections, 5 patients with systemic inflammation but no evidence of infection and 15 healthy control subjects. The operator of the flow cytometer was unaware of the identity of the patient blood samples and results were generated within 3 h of sample collection.

RESULTS. The distribution of blood neutrophils bearing TLR4 was increased in patients with Gram-ve infections (mean 19±4%; p<0.001) when compared with patients with Gram+ve infections (mean 4±4%), patients with non-infective systemic inflammation (mean 2±1%) and healthy subjects (mean 1±1%). The increased prevalence of neutrophils expressing TLR4 in patients with Gram-ve infections was independent of whether bacteria were isolated from sterile or non-sterile sites. We also examined whether an increase in the number of neutrophils expressing TLR4 could discriminate patients with Gram-ve infections from the other subjects investigated. Analysis with receiver operating characteristic (ROC) curves returned a sensitivity of 88% and a specificity of 97%.

CONCLUSION. The present findings could lead to the development of a rapid test for Gram-ve bacterial infections and the introduction of new pathological insights into sepsis.

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THE NUMEROSITY OF BLOOD NEUTROPHILS EXPRESSING TLR4 ARE INCREASED IN PATIENTS WITH GRAM-VE INFECTIONS

0579

THE INFLUENCE OF INFECTION INCIDENCE ON PATIENT MORTALITY AND DURATION OF STAY AT THE ICU

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INTRODUCTION. Infections at the Intensive Care Units (ICU) are a substantial clinical problem due to their high incidence and significant impact on patient mortality, as well as on the duration of their treatment within ICUs. The objective of the present study was to analyze the infections occurring at our department and to identify those micro-organisms responsible for infections, with consideration of their susceptibility to antibiotic treatment. Moreover, an evaluation was performed in respect of correlation between infection incidence, patient mortality and duration of stay at the department.

METHODS. The study concerned all patients admitted to the ICU between February and July 2004, with a stay duration of >24h. The occurring infections were divided into groups, depending on the first symptoms occurrence, of external infections (<48h) and intra-department infections (>48h). When diagnosing infection symptoms, the CDC definitions were applied.

RESULTS. 78 patients were qualified to participate in the study, among which external infections were diagnosed in 73%, while infections at the department were diagnosed in 44.9%. The average APACHE II scale scoring in the first day of treatment was 20, higher in the case of external infections. The most commonly occurring infections were: pneumonia (35%), blood infections (17%), lower respiratory tract infections (15%) and urinary tract infections (12%). The most commonly cultured micro-organisms responsible for observed infections were: Candida sp., Enterococcus sp., Staphylococcus sp., Pseudomonas sp., Enterobacter sp. and Acinetobacter sp. Among studies patients, the death rate was 37%. High mortality correlated with old age, higher APACHE II scoring and presence of externally acquired infections. The average stay at the department was 10 days and was significantly longer in patients with department infections.

CONCLUSION. The distribution of infections and their etiological pathogens was similar to results obtained in studies performed in other developed countries. A correlation was evidenced between the occurrence of external, internal infections and, respectively, the increased mortality and length of hospitalisation of patients within ICUs.

0580

HIV PATIENTS WITH MECHANICAL VENTILATION IN THE INTENSIVE CARE UNIT

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INTRODUCTION. HIV patients are a more frequent group in ICU. We analyze the antecedents, immunitary state, submit reason, immunation reason (OTI), presence of mechanical ventilation associated pneumonia (MVAP), stay and mortality in HIV patients who required mechanical ventilation (MV).

METHODS. Retrospective study between January of 2003 and December of 2005 of the patients HIV in whom MV was required. Results were generated within 3 h of sample collection.

RESULTS. In this period 50 patients were admitted, 10% in 2003, 36% in 2004 and 46% in 2005. 34 (68%) received MV, being their average age of 39.74 (33.42-46.06) and 82.4% were men. 35% had 17.6% women. 82.55% presented some type of hepatopathy, 52.9% drug consumption and 35.5% alcohol. 50% received antirretroviral treatment previously and 26.5% were C3, 11.7% C2, 14.7% B1 and 8.8% A3 in the clinical scale of AIDS. APACHE II means was 15.5 (7.18-23.82). 47.1% submit by respiratory insufficiency, 17.6% by shock, 17% after an operation, 6% by polytrauma, 6% by low conscious level and 3% by poisonings. The reason for IOT was a respiratory infection on 44.1%, low conscious level 20%, operation 20.6%, ARDS 12% and a acute pulmonary edema 3%. Average of MV days was 4.6, rate of weaning failure was 11.8%, average of weaning days was 2.29 and the more frequent way of weaning was the support pressure (44.1%). 32.5% developed MVAP. 82.2% received antibiotic; 47.05% antifungal and 23.5% antirretroviral treatment. 52.9% received vasoactives drugs, 47.1% displayed renal failure and 26.5% required extrarrenal purification. Mortality was 41.2% and average stay 8.88 days. Making the statistical analysis Chi-square significant differences were seen between mortality and previous immune state, APACHE II and OTI reason and between MVAP and MV days, reinition rate and days of weaning.

CONCLUSION. The presence of HIV patients in ICU every time is greater. Most frequent cause of submit and OTI is the respiratory insufficiency and the respiratory infection. Time of MV and the failure in weaning are associated to greater incidence of pneumonia. HIV patients with low immune level are more frequent and they are associated to greater mortality.

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0581

PROGNOSTIC IMPACT OF CATHETER-ASSOCIATED URINARY TRACT INFECTION IN CRITICALLY ILL PATIENTS

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INTRODUCTION. Catheter-associated urinary tract infection (CAUTI) is a frequent issue in the intensive care unit (ICU). However, its impact on patients’ outcome remains controversial. Discrepant results of the few available studies may be ascribable to patients’ baseline heterogeneity and subsequent events. Our aim was to yield an accurate estimation of the association of CAUTI with ICU and hospital mortality, controlling for all potential confounding factors.

METHODS. We conducted a nested case-control study in a multicenter cohort (the OUTCOMEREA database). Patients who developed CAUTI after 48 hours of ICU stay (cases) were matched to controls using the n:m matching procedure of the SAS software. Matching criteria were as follows: sex, age ± 10 y, SAPS II ± 10 pt, length of urinary tract catheterization, and presence or absence of diabetes mellitus. The association of CAUTI with ICU and hospital mortality was assessed using bivariate and multivariate conditional logistic regression.

RESULTS. Of the 5016 OUTCOMEREA database patients, 64 had urinary tract infection on ICU admission and were excluded. Among the remaining 4952 patients, 286 (5.5%) had CAUTI, of whom 273 (95.5%) were matched successfully to 896 controls for all matching criteria. The main microorganisms identified were: Escherichia coli (30%), yeasts (28%), and Pseudomonas aeruginosa (18%). The median [interquartile range] time to CAUTI was 11 [6-19] days from the insertion of the urinary catheter. Crude odds ratios (OR) for ICU and hospital mortality associated with CAUTI were 1.064 (95% CI: 0.834-1.357, p = 0.62), and 1.239 (95% CI: 1.002-1.533, p = 0.04) respectively. Adjusted OR for ICU and hospital mortality associated with CAUTI were 0.846 (95% CI: 0.659-1.086, p = 0.19), and 0.949 (95% CI: 0.763-1.181, p = 0.64) respectively.

CONCLUSION. After controlling for confounding factors, CAUTI was not associated with an increased mortality in critically ill patients.

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0583

INFECTION IN THE ICU: IMPACT ON LONG-TERM OUTCOME AND QUALITY OF LIFE

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INTRODUCTION. The impact of an ICU-acquired infection on long-term mortality, subjective health status, and quality of life of patients with or without an infection on ICU admission was evaluated.

METHODS. 335 patients who stayed in a mixed ICU in a university teaching hospital for longer than 48 hours were prospectively enrolled during 14-month study period in 2002-2003. Mortality data was obtained and the health-related quality of life was studied by EuroQol-five dimension (EQ-5D) questionnaire in January 2005.

RESULTS. Of the 272 hospital survivors 83 died after discharge, i.e. a total of 146 (43.6%) patients died during the follow-up period. The median follow-up time after ICU discharge was 21.5 months. In patients without an infection on admission (NIG) the long-term mortality was 45.7% in those who developed an ICU-infection and 26.5% without ICU-infection (p=0.027). In patients with infection on admission the long-term mortality did not differ between those with and without infection (53.3% vs 46.1%, p=0.38). EQ-5D response rate was 75% of survivors, without differences in five dimensions between the study groups except that in NIG those patients who developed an ICU-infection had significantly less often autonomy than those without ICU-infection (p=0.049). The current general health was considered to be at least moderate in 90.6% but when it was compared to the status before ICU admission it was worse in almost half of the responders. Only 36% of those who returned to their previous jobs.

CONCLUSION. Our results show higher long-term mortality among patients who did not have an infection on admission, but who developed an ICU infection. Almost half of the patients considered their general health to be worse than before ICU admission and a minority had returned to work.

0582

WHAT IS THE REAL IMPACT OF ICU-ACQUIRED INFECTION ON ORGAN DYSFUNCTION/Failure?

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INTRODUCTION. Infection is a common threat for ICU patient and is understood as eventually provoking sepsis which can lead to organ dysfunction/failure (OD/F). The sequential organ failure assessment (SOFA) score is a measure of the importance of OD/F. The SOFA Max is the sum of all the OD/F occurring during ICU stay and is well correlated to ICU mortality (2).

METHODS. In order to evaluate the role of ICU-acquired infection, we defined a SOFA Part 1 and a SOFA Part 2 as the sum of OD/F occurring before and after the first episode of ICU-acquired infection respectively and compared them between themselves and with SOFA Max.

RESULTS. Six hundred eleven patients with a median age of 66 (IQR: 53-75) and hospitalized for more than 48 h in the ICU of CHU Liège Belgium were prospectively followed during one year (2004). There were 29.5% medical, 38.5% scheduled surgery, 19.8% emergency surgery and 12.4% trauma patients. The mean SAPS at entry was 61 (49-74), SAPS: 44 ± 13.4, ICU length of stay: 23 (15-35), presented 281 infectious episodes: 176 with sepsis, 41 with severe sepsis and 64 with septic shock. SOFA Part 1 of those patients in whom the most severe manifestation was septic shock (n=51), severe sepsis (n=25) and sepsis (n=100) represented 72.0, 88.7 and 95.8% of the corresponding SOFA Max respectively, indicating that the medical ICU history was almost already written before the occurrence of ICU-acquired infection except for septic shock. The SOFA Part 2 (6.0 ± 3.6 and 8.7 ± 3.8) was indeed lower than SOFA Part 1 (10.4 ± 4.3 and 10.9 ± 5.1) in both sepsis and severe sepsis group respectively (p<0.001 for sepsis only) but higher in septic shock patients (13.3 ± 4.5 vs 11.5 ± 4.4) (p<0.001).

CONCLUSION. The most part of OD/F was present before ICU acquired infection; only septic shock had a real impact on the clinical status.

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0584

IS IMMUNOSUPPRESSION ASSOCIATED WITH INCREASED RISK FOR ICU-ACQUIRED MULTIDRUG-RESISTANT BACTERIA?

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INTRODUCTION. The aim of this study was to determine the relationship between immunosuppression and ICU-acquired multidrug-resistant (MDR) bacteria.

METHODS. Retrospective case-control study conducted in a 30-bed ICU during a 2-year period. All data were prospectively collected. All patients hospitalized >48h in the ICU were eligible. Immunosuppression was defined as active solid or hematological malignancy, organ transplantation, or leucopnia. MDR bacteria were defined as methicillin-resistant Staphylococcus aureus, ceftazidime or imipenem resistant Pseudomonas aeruginosa, A. baumannii, S. maltophilia, and extending spectrum β-lactamase producing Gram negative bacilli. MDR bacteria screening (nasal, anal and axilla swabs; and tracheal aspirate in intubated patients) was performed at ICU admission and weekly. Only MDR bacteria isolated >48h after ICU admission were taken into account. Isolation measures were applied in all patients at ICU admission, in patients with MDR bacteria, and in patients with immunosuppression. Immunosuppressed patients were matched (1:1) with immunocompetent patients according to all the following criteria: age ± 5 yrs, SAPS II ± 5, duration of ICU stay ± 3d, and category of admission. Risk factors for ICU-acquired MDR bacteria were determined using univariate and multivariate analyses.

RESULTS. 1065 patients were eligible, 133 (12%) patients were immunosuppressed, 128 (96%) of them were successfully matched. Incidence of MDR bacteria was significantly higher in cases than in controls (22 vs 12 MDR bacteria / 1000 ICU-days, p = 0.004). Univariate analysis identified transfer to the ICU from a ward (95% vs 86%), antibiotic treatment before ICU admission (68% vs 47%), antibiotic treatment in the ICU (98% vs 81%), mechanical ventilation (85% vs 73%), immunosuppression (65% vs 45%), duration of antibiotic treatment (13±34 days vs 5-6 days), and duration of mechanical ventilation (9±10 days vs 6±8 days) as risk factors for ICU-acquired MDR bacteria (p<0.05). Multivariate analysis identified antibiotic treatment before ICU admission (OR [95% CI]=1.9 [1.3-6.3], p = 0.003) and antibiotic treatment in the ICU (11 [1.4-8.3], p = 0.02) as risk factors for ICU-acquired MDR bacteria.

CONCLUSION. Immunosuppression is not independently associated with ICU-acquired MDR bacteria. However, protective isolation measures in immunosuppressed patients may have influenced this result.
0585 RISK FACTORS AND OUTCOME OF VENTRICULOSTOMY RELATED INFECTIONS (VRIs)
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INTRODUCTION. Ventriculitis is a serious complication of EVD use. The presence of the considered risk factors (RF) may influence VRIs incidence. We analyzed RF for VRIs (as an attempt to restrain their incidence) and the impact or outcome.

METHODS. Prospective observational study (Jan 97-June 05) of all consecutive patients (pt) admitted to our ICU with acute non traumatic intracranial haemorrhage who required EVD. Criteria proposed by Lozier et al. were used to define VRIs. Data were analyzed using a descriptive and a Chi-square analysis for categorical variables and a t test for continuous variables.

RESULTS. A total of 250 pt (114 males), mean age of 56±15 y., APACHE II 16.3 ± 9.2 points, GCS 9±6±4.2 required EVD; 158 pt had subarachnoidal (SAH) and 92 intraparenchimal (IPH) haemorrhage. Intraventricular haemorrhage was present in 198 pt. A total of 359 EVD were inserted. The mean length of catheterization was 20.3±16.3 days. VRIs episodes (ep) were found in 84 (33.6%) pt. A total of 98 VRIs were identified: 7 ventriculitis, 16 VRIs and 25 suspected VRIs (negative CSF cultures but chemistry and cytology strongly suggested a VRIs, the other 48 ep contaminations or colonizations. The mean time of onset of ventricular infections was 11.9±8.1 days. There were no significant differences for VRIs age, sex, alcoholism, chronic underlying pathology, intraventricular haemorrhage, APACHE II score, GCS at admission, venue of EVD insertion, type of EVD, cranialotomy, length of catheterization, intraventricular fibrinolysis, corticosteroids and barbiturates. RF for VRIs were SAH (21.3%, SAH vs 7.5% IHL, p<0.004); multiple catheters (26.3% pt with 1 EVD vs 11.8% pt with more than 1 EVD, p<0.004), and coinfected (p=0.006). Patients with VRIs presented during all ICU course, significantly higher rate of systemic infections, than did those without VRIs (90.2% vs 73.2%, p=0.002); required more VP shunt (p=0.017) and longer duration of ventriculostomy (p=0.01); they stayed longer in the ICU (p=0.01) and in the hospital (p=0.004). No statistically differences were found in ICU and in-hospital both, neurological morbidity and mortality rate.

CONCLUSION. Risk factors for VRIs were SAH, multiple catheters and coinfection. Prophylactic catheter exchange remains a practice option, but our data suggest that this procedure is not justified. VRIs was associated with a longer ICU and in-hospital stay but its presence did not influence survival.

0586 INCIDENCE AND RISK FACTORS FOR VAP IN A DEVELOPING COUNTRY: WHERE IS THE DIFFERENCE?
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INTRODUCTION. Latin America exhibits a wide range of differences, compared to developed nations, in genetic background, health services, and clinical research development (1). It is valid to hypothesize that the incidence and risk factors for ventilator associated pneumonia (VAP) in our setting may be substantially different of those reported elsewhere (2). We conducted a study to determine the incidence and risk factors for VAP in a University Hospital from Medellin, Colombia.

METHODS. Prospective cohort study in three Intensive Care Units (surgical-trauma, medical, cardio-vascular) in a 550-bed University Hospital. Critically ill patients (n = 270) who required at least 48 hours of mechanical ventilation (MV) between June 2002 and October 2003 were followed until ICU discharge. VAP diagnosis or death. Independent variables were age, gender, previous use of antibiotics (less versus higher than 48 hours before MV), Glasgow Coma Scale and APACHE II at admission, thoracic or major abdominal surgery before admission to ICU, type of enteral nutrition, type of ICU, requirement of paralytic agents, tracheostomy, reintubation, aspiration of gastric content, and comorbidity conditions. We performed univariable and multivariable Cox proportional hazards regression analysis to evaluate potential risk factors for VAP.

RESULTS. 60 patients (22.2%) developed VAP 5±3.6 days after admission. The overall incidence of VAP was 29 cases per 1,000 ventilator-days. The daily hazard for developing VAP increased until day 8, and then decreased over the duration of stay in the intensive care unit. The only statistically significant factor after multivariable analysis was gender, with being female reducing 57% the risk of pneumonia (HR: 0.43, 95% CI: 0.19-0.96).

CONCLUSION. The epidemiologic profile of VAP in terms of incidence, length of stay and clinical course resembles the general pattern described everywhere. Interestingly, however, we could not identify any potentially modifiable risk factor for VAP. A comprehensive multicenter study is warranted. It should provide deep insight about the specific microbiological, generic and clinic features of VAP in our setting.

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0587 HEALTH-CARE RELATED COMMUNITY-ACQUIRED INFECTION
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INTRODUCTION. Community-acquired sepsis (CAS) is a prevalent entity and reason for Hospital admission. The initial evaluation and treatment is dependent of the focus, comorbidities and place of acquisition being important to consider association with health care environment.

METHODS. In the context of a prospective, cohort, multi-centred study, on CAS admitted in Portuguese ICUs, from 01/12/2004 until 30/11/2005, we analyse the sub-group of patients with a health-care related infection (HCR). HCR was defined and divided in four groups of patients: a) had wound dressing or iv treatments in the previous 30 days, b) observed at a hospital or haemodialysis centre or had chemotherapy in the previous 30 days, c) admitted to an acute care hospital for two or more days in the previous 90 days, d) living at a nursing home or institution.

RESULTS. In this period 4142 patients were admitted to the 17 participating ICUs. CAS was present in 897 patients (22%) and 23% of them had a health-care related infection. Comparing HCR with non-HCR patients similar focus of infection and severity of sepsis was found as well as 28-day ICU and hospital outcome. In respiratory infection comparing the 5 most prevalent microbes in non-HCR and HCR: Streptococcus pneumoniae, MSSA, Haemophilus influenza, Legionella pneumophila and Klebsiella pneumoniae vs Streptococcus pneumoniae, MSSA, Klebsiella pneumoniae, Pseudomonas aeroginosa and MRSA. For intrabdominal infection the 3 most prevalent microbes were: Escherichia coli (52% in non-HCR and 41% in HCR), Enterococcus faecalis/faecium (16% in HCR and 14% in HCR) and Klebsiella pneumoniae (12%) in non-HCR and Candida albicans (10%) in HCR. For urinary infection, comparing non HCR with HCR, the 3 most prevalent microbes were: Escherichia coli (60% vs 56%), Proteus mirabilis (9% vs 11%) and Klebsiella pneumoniae (6% vs 17%).

CONCLUSION. Regarding focus of infection, severity of sepsis and outcome no significant association was seen with HCR when comparing with non-HCR. The microbiological profile was different, particularly in the respiratory infections where Pseudomonas and MRSA gain a place among the most prevalent microbes in patients with HCR.

0588 THE INFLUENCE OF MULTIPLE RISK FACTORS ON TRACHEAL COLONIZATION AND TRACHEAL PNEUMONIA IN ICU
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INTRODUCTION. There are many well-known risk factors (RF) that contribute to the high incidence of hospital pneumonia (HP). One of them is previous colonization of the gastrointestinal and upper respiratory tract. Therefore, RF for HP could also influence on previous colonization of respiratory system. The data showing the influence of RF on tracheal colonization (TC) and the influence of these RF on the period between TC and HP are lacking.

METHODS. In 10 years lasting prospective randomized clinical study in an intensive care unit (ICU) the data were collected last from all consecutive patients who were not on antibiotic therapy at the time of inclusion. 81 patients were included. Most frequent diagnosis was tetanus (65 patients) and encephalitis (15 patients), and 3 patients were treated for other illness. Mechanical ventilation (MV) was performed in 52 (64%) patients. Mean APACHE II score was 19.5 (range, 12 to 24). 26 patients received sucralfate for stress-ulcer prophylaxis, 27 patients received ranitidine, and 28 patients received no stress-ulcer prophylaxis. Statistics: program SPSS.

RESULTS. pH of gastric juice was significantly higher in patients receiving ranitidine than in other two groups. There were no differences in occurrence of HP between these groups. The most common microorganisms that colonized trachea was Staphylococcus aureus, Pseudomonas aeroginosa, Acinetobacter calcoaceticus, Klebsiella spp. and Enterobacter spp. HP was found in 55 patient and in 66% HP was preceded with TC. Mean latent period between TC and HP (LP) was 2.8 days (range, 1 to 6 days). RFs that were found to have influence on incidence of HP did not always influence the TC. Selected combination of RF (APACHE II > 16, age > 65, MV and sedation) comparing to the single RF could influence on higher incidence of HP and less on incidence of TC. Sedation and previous antibiotic therapy were independent RF that influence on longer LP. Values of pH of gastric contents were related to shorter LP. The longest LP was found in Acinetobacter spp.

CONCLUSION. In most cases HP was preceded with TC. Combination of selected RF could influence on higher risk of TC and HP. The duration of LP was related to the type of RF and microorganisms.

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0589
NOSOCOMIAL INFECTIONS IN CARDIAC INTENSIVE CARE UNIT
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INTRODUCTION. The complexity of intensive care has been accompanied by increased risk of nosocomial infections (NI). The prevention of NI requires knowledge of rate, sources, pathogens, incompatibility and antimicrobial resistance patterns. The objective of this study was to analyze the NI in our cardiac intensive care unit (CICU).

METHODS. All patients (pts) admitted to our CICU during 2005 for more than 24 h were included in a prospective, observational study. Surveillance infection charts included: demographic data, diagnosis, site of infection, date of onset, pathogens tested and antimicrobial susceptibility. For the patients with NI who died, the relationship of the infection to death was investigated. Device-associated infection rate (DIR) and device utilization (DU) ratio were calculated. DIR was expressed per 1000 device-days and DU as the ratio of the number of device-days per number of patient-days.

RESULTS. 588 pts were admitted in CICU during the year and 503 were hospitalized more than 24 h. In 27 pts (53.9%), 55 NI were registered, giving a rate of 10.9%. In 11 pts multi-drug resistant Acinetobacter species was associated with hospital-acquired pneumonia (HAP). Klebsiella pneumoniae (ESBL+) was responsible in 5 pts for urinary catheter infections. Gram-positive cocci were responsible for the infection of lines and the catheter related infections (n° 2). In 17 pts with NI we registered 6 deaths (22% mortality). In pts without NI (n=561) the in-hospital mortality was 7.7%.

The ventilator associated pneumonia (VAP) attributable mortality was 13%.

TABLE 2.

| Device-associated infection rate (DIR) and device utilization (DU) | DIR | DU |
|---|---|---|
| Ventilator | 38.85 | 0.26 |
| Central line | 2.21 | 0.97 |
| Urinary catheter | 5.75 | 0.91 |

CONCLUSION. In our CICU the most common NI is pneumonia. The rate of VAP but not the ventilator utilization is higher than those reported by CDC. In our study VAP increased in-hospital mortality.

0590
IMPACT ANALYSIS OF VENTILATION-ASSOCIATED PNEUMONIA IN THE CLINICAL EVOLUTION OF THE CRITICALLY ILL
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INTRODUCTION. Clinical studies, so far, produced conflicting results regarding the role of ventilation-associated pneumonia (VAP) as an independent prognostic factor in terms of mortality, length of hospital stay and mechanical ventilation days. In this study we investigated the contribution of VAP in the prognosis of critically ill patients.

METHODS. We performed a prospective observational study of 88 patients aged between 18 and 95 years, who received invasive ventilatory support for more than 48 hours, comparing the group which developed VAP to the control group without pneumonia. The primary endpoints were absolute mortality, length of ventilation support and ICU stay (LOS), while the secondary endpoint was the frequency distribution of microorganisms in the bronchoalveolar lavage. The exclusion criteria were: advanced stage neoplasm or neuromuscular disease and coma Glasgow scale chronically less than 8. Categorical variables were compared by the chi square test and the continuous variables were compared by the T test. Potential biases were controlled by multiple linear regression.

RESULTS. The incidence of VAP was 19.2 cases/1000 ventilation days. In the control and VAP groups, the measured variables were respectively as follows: median age 75 years (SD=15) versus 63 years (SD=11), p=0.001; mean APACHE II 16 (SD=6) versus 18 (SD=3), p=0.123; the median initial SOFA 6 (SD=3) versus 5 (SD=4), p=0.21; median ventilation duration 11 days (SD=9) versus 17 (SD=5), p=0.003; the mean ICU LOS 18 (SD=13) versus 18 (SD=4), p=1.0; the mortality 56% (IC=24-74%) versus 98% (IC=39-78%), p=0.06. In the multiple regression, including age, APACHE II, initial SOFA, VAP and diagnostic category (clinical or surgical), only VAP tended to relate to mortality (b=0.23 and p=0.086). Bronchoalveolar lavage was performed in 75% of the clinically diagnosed VAP. The culture results were: 4% negative, 25% Pseudomonas aeruginosa, 17% Acinetobacter spp., 13% MSSA, 8% Klebsiella pneumoniae ESBL, and 4% MSSA.

CONCLUSION. The results suggest a trend of VAP to relate to increased mortality, even after multivariate adjustment. The ventilation duration was significantly shorter in the control group, although there was no statistically significant difference in LOS between groups. The isolated causative agents were the expected from the series of patients commonly reported in the literature.

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0591
HOSPITAL ACQUIRED PSEUDOMONAL PNEUMONIA IN CRITICAL CARE – A COMPARISON WITH MRSA PNEUMONIA.
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INTRODUCTION. Pseudomonal pneumonia has been associated with an increase in mortality in critical care patients. Its outcome has not previously been directly compared with pneumonia due to Methicillin Resistant Staphylococcus aureus (MRSA) in a critical care population.

METHODS. We have performed a retrospective case note review of patients with pure respiratory cultures of Pseudomonas species and MRSA. From 1998 to 2005 95 patients had a pure culture of MRSA, 110 for Pseudomonas sp. Case note review involved assessments of illness severity, clinical pulmonary infection scoring (CPIS), critical care and hospital survival and critical care stay of survivors. Of these 205 patients we have currently reviewed 89 case notes, preliminary results are presented here.

RESULTS. Of the 89 case notes reviewed there were 69 hospital-acquired pneumonias, 2 patients had both MRSA and pseudomonal pneumonia and were excluded from further analysis. There was incomplete data for 10 patients. 48 patients had pseudomonal pneumonia and 19 had MRSA. The 2 groups of patients were well matched, with similar age, sex distribution, CPIS scores, incidence of bacteremia and Acute Physiology and Chronic Health Evaluation II scores at diagnosis. There were no outcome differences between the groups with respect to hospital and critical care survival and critical care length of stay (Table 1).

| TABLE 1. Clinical outcome according to infecting organism |
|---|---|---|
| ICU Survival (%) | Hosp. Survival (%) | ICU Stay days (sd) |
| Pseudomonas sp | 35 (73)* | 31 (65)** | 35.6 (25.4)*** |
| MRSA n=19 | 12 (63)* | 9 (47)** | 41.2 (14.6)*** |

*p=0.435 MUW test **p=0.159 MUW test ***p=0.562 MUW test

CONCLUSION. In this retrospective series there appears to be no survival disadvantage associated with pseudomonal pneumonia when compared to hospital-acquired MRSA pneumonia with similar illness severity.

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0592
EPIDEMIOLOGY OF NOSOCOMIAL PNEUMONIA IN THE POPULATION AT PHILIPPINE HEART CENTER
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INTRODUCTION. The pattern of nosocomial pneumonia among infants, children and adolescent after cardiac surgery may differ from that in adult ICU.

METHODS. A retrospective cohort study of patients admitted at the pediatric cardiovascular surgical ICU age 18 years old and below, who developed nosocomial pneumonia after cardiac surgery from January 2003 to June 2004 were reviewed.

RESULTS. A total of 608 patients underwent cardiac surgery, of which 360 patients underwent open heart surgery and 248 underwent closed heart surgery. Among these, 27 patients developed nosocomial pneumonia with the incidence of 4.4%. Independent predictors of pneumonia were: intubated state, feeding through NG/TG/OGT, previous antibiotic use, use of sedatives and H2 receptor antagonist. A total of 37 pathogenic microbial strains were isolated. Gram negative were the most frequent isolates (33 isolates, 89.18%). The most common etiologic organisms are Stenotrophomonas maltophilia (11 isolates, 29.72%).

CONCLUSION. Gram negative bacilli remains the most common pathogen isolated in our study. Risk factors in the development of nosocomial pneumonia include intubated state, feeding through the NG/TG/OGT, previous antibiotic use and use of sedatives and H2 receptor antagonist. It is important to recognize the predominant pathogen associated with nosocomial pneumonia since infections may vary between hospitals as well as between specialized units within same hospital. The findings of the study would recommend to adopt multidisciplinary approach in the implementation and development of strategies to reduce overall infection in the pediatric ICU.
0593
RESOLUTION OF RETROPERITONEAL HAEMATOMA USING rFVIIA WITHOUT NECESSITY OF SURGICAL CORRECTION

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INTRODUCTION. For many years Recombinant Factor VIIa (rFVIIa) has been used with success for treatment and prophylaxis of hemorrhagic events in hemophilic patients, with inhibitors for VIII and IX factors. Better understanding of its action mechanism, turned it an adjunctive therapy in severe trauma patients or during surgeries in patients without previous coagulopathy. Another problem in clinical scenario are patients using warfarin, that must be submitted to emergency surgical procedures. Recombinant FVIIa, had been used in these patients successfully.

METHODS. Descriptive report of utilization of rFVIIa to treat a retroperitoneal haemorrhha after an endovascular procedure in an anticoagulated patient.

RESULTS. The authors describe rFVIIa utilization in a puerperal patient, who was submitted to an endovascular procedure, correct a iliac arterial-versus fistula, by part of treatment of inferior Cava Vein thrombectomy, Left Iliac Vein thrombectomy and venous thrombectomy of left limb, as a result of Phegmasia corrugata dolens that occurred fifty days before. As a complication of an angioplasty of this vein to correct an extrinsic compression of iliac artery, a large retroperitoneal haematoma was formed with haemorrhagic shock. 9.6 mg of rFVIIa was used, and bleeding was controlled with prompt haemo-dynamic stabilization, without surgical intervention. The patient was submitted to abdominal CT at admission, 3rd and 7th day of evolution, which showed complete resolution of haematoma. Laboratory data showed an improved coagulation.

CONCLUSION. In this kind of vascular access complication, rFVIIa showed to be a safe and effective drug.

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0594
IMPORTANCE OF ENDOTRACHEAL INTUBATION IN PREHOSPITAL TREATMENT OF CHILDREN WITH HEAD INJURIES

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INTRODUCTION. Intubation - Intubation and airway control of injured children is of vital importance, but despite its advantages is associated with many risks when performed outside the hospital and by the untrained physicians. Aim of this study was to determine the importance for the survival of the children with cranioencebral injuries, and also for final outcome of treatment.

METHODS. Methods -This study is a clinical, partly prospective, partly retrospective that includes 60 patients with isolated cranioencebral injuries, aged up to 17 years, and with Glasgow Coma Score under 8, that did not require surgical treatment. Patients were divided in two groups each with 30 pa-
tients. The first group included patients that were endotracheal intubated, and the other group included patients that were not intubated.

RESULTS. Results - There was no statistically difference between groups regarding the sex, age and Glasgow Coma Score. Regarding the endotracheal intubation there was a statistically significant difference, in the first group 86.7% of the patients were intubated during the prehospital treatment, while 16.7% of the patients from group II were intubated. A greater percentage of patients from group I underwent controlled (66.5%) or assisted (20%) mode of ventilation, and 13.3% of patients were on spontaneous breathing. Among the patients that have survived also a greater percentage underwent controlled (48.6%) and assisted (13.5%) mode of ventilation. Among the patients that did not survive a greater percentage underwent spontaneous breathing (56.5%).

CONCLUSION. Conclusion - According to the all protocols for the treatment of children with cranio-
encebral injuries, endotracheal intubation is obligatory for any patient with a greater percentage under-
went controlled (48.6%) and assisted (13.5%) mode of ventilation. Among the patients that did not survive a greater percentage underwent spontaneous breathing (56.5%).

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0595
IS YOUR CRASH TROLLEY FULLY EQUIPPED?

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INTRODUCTION. Repeatedly audit demonstrated that our cardiac arrest trolleys did not provide the minimum level of emergency airway equipment resulting in numerous adverse events. Inaddition there was no cleaning policy for ward-based laryngoscopes [1] nor was equipment for confirmation of ETtube placement available.

METHODS. An infection control and airway equipment audit was undertaken of 48 resuscitation trolleys. Equipment levels were assessed against an approved stock list and the laryngoscopes where observed for visible contamination and where it was noted a microbiological sample was obtained.

RESULTS. During the 1st audit no resuscitation trolley was fully stocked and although only 12.5% laryngoscopes where bacteriologically contaminated 48% were visible dirty. There was a marked improve-
ment in emergency airway equipment provision following the introduction of the airway tray (table 1) and the tray facilitated the introduction of equipment for confirmation of ET-tube placement.

|          | 1st audit | 2nd audit |
|----------|-----------|-----------|
| Laryngoscope blade 3/4 | 83% | 100% |
| 2 handles | 21% | 100% |
| Tracheal introducer | 37% | 100% |
| Colourmetric EtCo2 | 0% | 100% |
| LMA size 4/5 | 21% | 100% |
| Dirty | 48% | 0% |
| Bacterial contamination | 12.5% | 0% |

CONCLUSION. The lack of emergency airway equipment plus the state of cleanliness is a major cause for concern. The introduction of a pre-packed single-use airway tray containing all emergency airway equipment successfully ensured the provision of clean emergency airway management.

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0596
MICRODIALYSIS IN SHOTGUN CRANIAL INJURY WITH POSTTRAUMATIC MENINGITIS – CASE REPORT

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INTRODUCTION. Posttraumatic infection is a serious complication of missile brain wound. Early beginning of appropriate treatment is important for outcome. We present our experience from the use of multimodality neuromonitoring (Intracranial Pressure, Brain Tissue Oxygenation and Microdial-
ysis) in a patient with shotgun penetrating cranial injury. Elevation of lactate / pyruvate (L/P) ratio measured by Microdialysis was an early indication of posttraumatic meningitis, treated intravenously and intrathecally.

METHODS. Our patient, male, 35yrs) was injected by a small diameter shotgun from short distance. Missile entered cranial cavity via the right zygomatic region and came out via the parietal region ho-
molaterally. Tunnel passed through the right temporal and parietal lobes. There were extradural and subdural haematomas together with multiple right hemisphere contusions. After emergency surgery (for evacuation of clots and debridement) neuromonitoring catheters were placed in ICU ward via a 5.3 mm right frontal burrhole. Catheters’ tips were guided inside right frontal lobe white matter, at the penuina of hemorrhagic contusion.

RESULTS. During the first 7 days the levels of monitored neuromarkers were controlled using bar-
biturates : JCP under 25 mm Hg, PaO2 under 25 mm Hg, L/P ratio round 25. On day 8 there was an elevation of L/P ratio levels (30-35). A lumbar puncture showed meningitis (acinetobacter sp). There were no indications of brain abscess or cerebritis (no new CT-scan findings, negative cultures from surgical wound). Antibacterial medication (colistin) was administered intravenously (9 million units per day) and intrathecal (500 000 units every second day). Next two days (9 and 10) JCP levels were also raised (round 30 mm Hg). PaO2 levels remained normal. From day 11 and on there was improvement of fever and of CSF cell index, together with JCP normalization. Neurological (short-term) outcome was excellent, with no remarkable handicaps.

CONCLUSION. 1) Elevation of brain Lactate / Pyruvate (L/P) ratio (as measured by Microdialysis) can be an early indication of posttraumatic CNS infection and can lead to early beginning of effective treatment. 2) Intrathecal colistin administration is valuable in the treatment of meningitis caused by multi – drug resistant acetobacter.

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0597
MEDIASTINAL CATHETER: A CENTRAL VEIN CATHETER COMPLICATION (CASE REPORT)
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INTRODUCTION. Malpositioning of the catheter is not a rare complication that is seen during central vein catheter insertion with Seldinger technique.

METHODS. 57 years old female had T2–L1 compression fracture due to traffic accident. After anesthesia induction he was intubated with right bronchial tube and left single lumen subclavian central vein catheter was inserted. During prooperative period the patient had a stable hemodynamic and respiratory situation. 3000 mL fluid infusion and 2 Units of blood transfusion were given during 5.5 hours. Postoperative fluid balance was ± 2800 mL. During surgery, left toracotomy was performed and left chest tube was inserted. After surgery she was admitted to ICU for postoperative care. Chest X-ray showed no abnormality within the catheter localization (Picture I). Total fluid infused through the catheter in ICU was 2555 mL and the fluid balance was calculated as ± 1100 mL. On the second day she was transferred to ward. According to the files, besides oral intake she received total of 1280 mL IV fluid where total balance was found to be ± 1375 mL. The day after she felt shortness of breathing and her physician’s early diagnosis was hypovolemia and fluid restriction, diencephalic and bronchodilator therapy was started. In the following 8 hours her dyspnea did not resolve and she became tachypnic, started sweating and fever rose to 38.2 C. Blood gas analysis on spontaneous breathing with face mask (FiO2: 0.5) revealed PaO2: 55 mmHg, PaCO2: 58 mmHg, pH: 7.51, HCO3: 31.8 mmol/L, BE: 1.5 mmol/L, SatO2: 73.7 and she was admitted to ICU. Chest X-Ray showed enlargement in the mediastinum (Picture II). As this suggested a catheter related complication, thorax CT scan was taken with contrast solution given via the catheter. Catheter tip was found in the mediastinum (Picture III) and the catheter was withdrawn immediately.

RESULTS. Her tachypnea and dyspnea resolved gradually. There was a progressive improvement. Next day control chest X-rays showed that mediastinum reduced to normal sizes (Picture V) and hypoxemia resolved. She was transferred to ward and was discharged on the 8th day.

CONCLUSION. One of the central vein catheter complications is malpositioning. In this case the localization site mediastinum which led to clinical worsening and deterioration. We showed with this case that the removal of the catheter and leaving the mediastinal fluid to spontaneous absorption a better and safer approach when compared to an insertion of a drainage tube to the same site.

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0598
OUTCOME AND CHARACTERISTICS OF TRAUMA PATIENTS HOSPITALIZED IN A GREEK ICU IN A FIVE YEAR PERIOD
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INTRODUCTION. Road traffic accidents (RTAs) remain one of the most frequent causes of admission in Intensive Care Units in industrialized countries (1). These accidents are caused either by car or by motorcycle or finally victims are pedestrians struck by a vehicle. Our purpose was to examine, in this preliminary study, the demographic characteristics of these patients as well as their outcome.

METHODS. During a five - year period (1st January 2000- 31st December 2005), all patients admitted in our 10 - bed general ICU unit as victims of road traffic accidents (VRTAs) were included in this retrospective study. Characteristics recorded were age, sex, nationality, length of ICU stay, ISS score and outcome.

RESULTS. During these five years, 1027 patients were hospitalized in total in our ICU. Two hundred eighty eight patients (a percentage of 28%) were VRTAs. 240 p were of Greek origin (84%) and the rest (16%) were foreigners, most of them immigrants. Among these 288 p, 228 were men (79%) and 60 (21%) were women. 16.2 for men, whilst 1.3 for women. Their age range was 14 - 80 years. Their mean age was 34.1 38.8 days: 19.5 years. The mean ICU length of stay was 24.6 (range: 0 - 213). Finally, mortality was 31.5 sixty-four deaths occurred (22.1%) among the study group.

CONCLUSION. Our results confirm the fact that road traffic accidents are among one of the main causes of admission in our ICU. Victims are mostly economically productive young adults of male sex and in almost a quarter of the cases accidents lead to patients’ death. A prolonged hospitalization is common and many victims suffer from chronic and persistent disabilities. Interventions are needed and drastic measures must be taken in order to diminish the number of victims and the untoward consequences of VRTAs.

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0599
EFFECTS OF CORTICOIDS IN PATIENTS WITH ACUTE SPINAL CORD INJURY.
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INTRODUCTION. To evaluate the safety, the complications and effect on neurological outcome of high-dose methylprednisolone sodium succinate (MPSS) versus no medical treatment in patients with acute spinal cord injury admitted to our ICU in the last 11 years.

METHODS. From January 1994 to December 2005, we retrospectively analyzed 82 patients with acute spinal cord injury admitted to our ICU. Fifty nine patients received MPSS according to NASCIS II protocol and 23 did not received. Mortality and septic complications were recorded during ICU stay. Frankel grade was assessed at admission and at discharge of ICU.

RESULTS. Patients who did not received MPSS had a higher Injury Severity Score (p =0.006). There was no difference between those patients who received steroids and those who did not in mortality (OR: 1.07, 95% CI: 0.90-1.27; p= 0.39) and in functional improvement (OR: 0.96, 95% CI: 0.45-2.04; p= 0.93). There was a trend towards an increase in septic complications in the MPSS group (18% vs 4%; OR: 3.5, 95% CI: 0.47-26.16; p= 0.27) although this did not achieve statistical significance.

CONCLUSION. The present study confirms the absence of benefit of MPSS therapy in patients with acute spinal cord injury. Not only was there no significant difference in outcome in this study, but also there was a trend to improve septic complications in patients who received MPSS.

0600
ABDOMINAL COMPARTMENT SYNDROME
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INTRODUCTION. Compartmental abdominal syndrome is due to increase abdominal pressure which produces ischemic bowel and multiple organ failure.

METHODS. An 82 year old female was admitted to the orthopaedic ward with a hip fracture following a fall. Her past medical history included arterial fibrillation treated with anticoagulant. 24 hours after admission to the hospital, she was transferred to intensive care unit with a hemorrhagic shock. A CT scan of her abdomen revealed a retroperitoneal haematoma. A few hours after the CT scan, she presented with a compartmental abdominal syndrome. Her blood tests showed a low haematocrit and platelets, renal failure, APT of 14% and INR of 6.36. An abdominal ecography and CT scan showed a right pararenal retroperitoneal haematoma with major component in the pelvic cavity. Intravenous fluids and inotropic drugs were administered as well as fresh frozen plasma and blood to treat her clotting disorders and hypotension. To release the high abdominal pressure, the abdominal wall was left opened (containing-open abdomen) and the opening covered with a mesh.

RESULTS. The wound was closed 5 days later due to the improvement of the abdominal pressure and organs function. Her clinical improvement allowed stopping inotropic drugs and sedation. Later on she presented with electrocardiac disorder and cardiac arrhythmia which caused myocardial infarction, heart failure and acute pulmonary oedema. She had a cardiac arrest which did not response to resuscitation.

CONCLUSION. Compartmental abdominal syndrome is a forgotten process in critically ill patients despite its high mortality. It is caused by increase abdominal pressure which leads to multiple organs failure. Abdominal pressure must be measured and decompressive surgery can reduce multiple organ failure which has been associated a bad prognosis.

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0601
BLUNT LIVER, SPLENIC AND RENAL INJURIES IN A GREEK LEVEL 1 TRAUMA CENTER
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INTRODUCTION. Our aim was the identification and analysis of the demographic and injury characteristics along with management and final outcome of trauma patients with blunt liver, splenic and renal injuries.

METHODS. We reviewed the Trauma Registry data of Heraklion University Hospital of all patients with blunt hepatic, splenic and/or renal trauma during a 4 year period.

RESULTS. One-hundred and eighteen trauma patients with liver, splenic and/or renal injuries were admitted to our hospital. Fifty-five patients (46.6%) had liver trauma, 58 (50.5%) splenic and 42 (46.8%) renal trauma. 17 (14.4%) had concomitant liver and splenic injuries, 14 (11.8%) liver and renal, 10 (8.4%) splenic and renal and 4 (3.4%) liver, splenic and renal injuries. Mean age of the patients was 34±2.8 years while 97 (82.2%) were men. Mean Injury Severity Score was 19.3±6.6. Mean grade of hepatic, splenic, and renal injury was 2.3±0.2, 2.6±0.3, 2.5±0.2, respectively. Vehicle accidents constituted the predominant injury mechanism (n=93, 78.8%) while 19 patients were injured by fall (16.1%), 4 (3.5%) from other causes. Thirty-six patients were in a car (30.5%) and 52 on a motorcycle (44.1%), while 68 were drivers (57.6%), 18 co-drivers (15.3%), 5 passengers (1.7%) and 5 pedestrians (4.2%). Thirty-two had concomitant head trauma (27.1%), 58 thoracic (49.1%), 14 abdominal injuries (11.8%), 19 pelvic (16.1%), 12 spinal cord (10.1%) and 25 injuries of the upper or lower extremity (21.1%). Eighty-four of them (71.2%) were initially selected for nonoperative management (NOM) while 34 (28.8%) were directly operated. Sixteen NOM-patients failed NOM (19%). Fifty-two patients were admitted in the ICU (44%) and 11 died (9.3%). Mean length of ICU and hospital stay was 9.4±2.2 and 17.8±2.5 days, respectively.

CONCLUSION. Trauma patients with blunt liver, splenic and renal injuries are usually young male car-or motorcycle-drivers. They frequently sustain concomitant injuries the most common of which are thoracic injuries. Nonoperative management of carefully selected blunt liver, splenic and renal trauma patients is safe and effective. Great caution should be paid, however, so as to identify those patients who are susceptible to fail NOM.

0602
IDENTIFICATION OF PREDICTORS OF CEREBRAL ISCHEMIA ON ADMISSION OF SUBARACHNOID HERNIATION
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INTRODUCTION. Subarachnoid aneurysm hemorrhage (SAH) is a illness with a high morbidity and mortality. The main complications determined of outcome after SAH are rebleeding, vasospasm and cerebral infarction and hydrocephalus. The aim of this study was the analysis of the association of variables on admission as independent predictors of poor neurologic outcome.

METHODS. Retrospective study. We examined 69 patients admitted to a critical care unit in a tertiary care university hospital with diagnosis of SAH between January 2003 and December 2005. We evaluated risk factors, clinical scales on admission (Wesman’s, Hunt and Hess, and amount of blood seen on initial head computerized tomography scanning by Fisher scale. All patients were treated according to standard management protocols with strict hemodynamic control, nimodipine and triple H therapy once symptomatic vasospasm was evident. In the same way we evaluated the frequency of aneurysm locations as well as anteriors reperfusions of cerebral ischemia.

RESULTS. 69% patients had intracranial aneurysm. 97.6% of them treated with endovascular coils. During the course of hospitalization 23% of patients had rebleeding. 42% hydrocephalus and the patients with symptomatic cerebral ischemia were 44.9% during the first 14 days. 30% patients die or delayed managements of this type of trauma. Fifty-two patients were admitted in the ICU (44%) and 11 died (9.3%). Mean length of ICU and hospital stay was 9.4±2.2 and 17.8±2.5 days, respectively.

CONCLUSION. Severity of subarachnoid hemorrhage, identifying patients with an increased risk of vasospasm through significant predictors on admission would be useful to decide to start more aggressive treatment.

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0603
RELATIONSHIP BETWEEN CONTINUOUS ELECTROENCEPHALOGRAM AND BIS IN THE BARBITURATE COMA MONITORING
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INTRODUCTION. Evaluate the correlation between pair of variables obtained with Bispectal Index (BIS) and continuous electroencephalogram (EEG) in barbiturate coma monitoring.

METHODS. Burst Suppression Ratio (BSR), in the EEG, (EEG INFINITY POD-SIEMENS), BIS value and BIS Suppression Ratio (SR) (BIS XP-ASPECT) was obtained in 172 simultaneous measures made in four patients. An statistical analysis was performed to evaluate the linear relationship between pairs of variables: SR-BSR and BIS value-BSR with Pearson’s correlation coefficient dispersion graphs.

RESULTS. 144 pairs of BSR-SDR and 145 pairs of BIS value-SR were evaluated. 27 (15.7%) measures were excluded, 10 because of technical problems (poor BIS signal’s transmission and disadjustament of the EEG electrodes) and 17 because of EEG low voltage on EEG electrodes. BSR-SR Pearson correlation coefficient: +0.318 (p<0.001). BSR-BIS value: Pearson correlation coefficient: -0.242 (p=0.003).

Correlation Graphs will be presented.

CONCLUSION. Although studied variables try to measure the same concept, in our sample we could not demonstrate a linear relation between BSR-BSR and BIS value-BSR. BIS signal transmission, electrodes adjustment on EEG-conv and other monitoring problems should be avoided for a correct interpretation.

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0604
ACUTE MAJOR AIRWAY INJURIES: CLINICAL FEATURES AND MANAGEMENT, A FIVE YEAR EXPERIENCE
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INTRODUCTION. Airway trauma is rare but morbid. They are encountered with increasing frequency because of improvements in prehospital care and early initiation of the Advanced Trauma Life Support (ATLS). The study is aimed to give a description of patients with airway trauma, to help providing data for better emergency services & delayed managements of this type of trauma.

METHODS. This retrospective, cross sectional study was conducted in 4university hospitals in Tehran, Iran; from 1997 to 2002 the study was conducted with 28 patients. Age, sex, mechanism of trauma, site of trauma, clinical manifestations, length of hospitalization, complications, mortality & treatment outcome were the main subjects extracted from units. SPSS 10.01 was used for analysis.

RESULTS. 22 (78.6%) patients were males and 8 (21.4%) were female. Mean age was 33±1.2 years. 8 (28.5%) cases presented with blunt trauma, 19 (67.8%) with penetrating trauma & 1 had anhaled burning chemical agent. 22 (78.6%) of cases had injuries in cervical airways & the rest 6 (21.4%) in thoracic airways. subcutaneous emphysema 7 (50%), dysphonia & dyspnea each with incidence rate of 6 (42.8%) were the most frequent manifestations. 85.7% of our patients underwent surgical treatament. Mean length of hospitalization was 5.6±2 days. The total rate of incidence for complications was 14.2%; 2 (7.2%) cases of wound infection, 1 (3.5%) with anastomosis dehiscence & 1 (3.5%) with collapsed lung after thoracotomy. The mortality rate was 10.7% (3 patients). The treatment outcome assessed excellent in 80% of cases, good in 1 (3.8%), acceptable in 1 (3.8%) & poor in 3 (11.5%).

CONCLUSION. Young men were more at risk for airway trauma particularly the penetrating types. Lower mortality and favorable treatment outcome are outstanding in this study. Rate of complication is average. Studies on non surgical treatments & autopsy based studies for airway trauma are suggested for complementary results.

REFERENCE(S). 1. Ayazi K, Ayazi S, Shadmehr M B. Airway trauma. Crit Care Med 2002 vol 30 n6. 2. Hess, and amount of blood seen on initial head computerised tomography scanning by Fisher scale. All patients were treated according to standard management protocols with strict hemodynamic control, nimodipine and triple H therapy once symptomatic vasospasm is evident. In the same way we evaluated the frequency of aneurysm locations as well as anteriors reperfusions of cerebral ischemia.

RESULT.
INTRODUCTION. To investigate the ICU factors associated with increased length of stay (LOS), days of mechanical ventilation (DMV), ICU mortality and neurological outcome at six months (GOS) in severely traumatic brain injury (TBI).

METHODS. A prospective observational study was conducted between 2004 and 2006. Inclusion criteria were patients with a low GCS (3–4) 58%; [5–6] 31%; [7–8] 24%), higher Apache II (22.5±7.2 pt in dead vs 17.8±6.5 pt in alive), bilateral dilated pupils (71% vs 19%, OR 10.5, CI 2.8-38.3), absent of pupils light reactivity (90% vs 29%, OR 1.17, CI 0.9-1.6), early hypotension (60% vs 29%, OR 3.6, CI 1.3-9.5) and a CPP below 60 (73% vs 29%). The neurological outcome at six months is worse in patients with a low GCS (3–4) 71%; [5–6] 58%; [7–8] 33%), higher Apache II (22.5±7.2 pt in bad GOS vs 16.8±5.6 pt in good GOS), bilateral pupils dilatation (82% vs 53%, OR 4.3, CI 1.2-15.2), absent of pupils light reactivity (79% vs 37%, OR 6.5, CI 3.3-13.7), early hypotension (72% vs 45%, OR 3.1, CI 1.1-8.6) or late hypotension (75% vs 42%, OR 3.8, CI 1.3-10.8) and a CPP below 60 (73% vs 49%).

CONCLUSION. Interestingly apart from the all previously known score factors over the prognosis of severe TBI we found that ICP insertion did not improve the outcome, but it got worse the LOS and DMV. Furthermore, the evacuation of focal lesions improved the mortality in ICU and increased the LOS. Finally, the presence of SAH increased ICU mortality in our study.
**0609**

**HEMODYNAMIC TOLERANCE OF INTERMITTENT HEMODIALYSIS**

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**INTRODUCTION.** P. Schortgen et coll. (1) showed that practice guidelines for intermittent hemodialysis (IHD) were useful to improve hemodynamic tolerance of IHD in critically ill patients. The aim of this study was to evaluate faisability and efficacy of these guidelines in the routine practice.

**METHODS.** We compared all IHD sessions performed before (observation period, OP), during (intermediate period, IP) and after (final period, FP) the implementation of the IHD rules. Guidelines were high sodium conductivity in dialysate and fresh dialysate, -limit ultrafiltration, -perform prolonged or daily IHD sessions, -require 110 mmHg systolic arterial pressure before start of the session.

**RESULTS.** Patients characteristics were comparable for IGS II score (60,52,56 respectively for the three periods), age (64,59 and 62) and incidence of septic shock (45%,45%, 48.3%).

**TABLE 1.** IHD sessions characteristics

|                          | OP               | IP               | FP               | p     |
|--------------------------|------------------|------------------|------------------|-------|
| Catecholamines Before IHD| 43.1%            | 35.12%           | 37.96%           | 0.18  |
| Invasive Ventilation     | 51.72%           | 65.65%           | 58.76%           | 0.007 |
| Intervention for instability | 36.2%          | 19%              | 10.54%           | <0.0001 |

**CONCLUSION.** These results show that implementation of guidelines is not only possible but also efficient to improve hemodynamic tolerance of IHD in critically ill patients.

**REFERENCE(S).** Schortgen P. Hemodynamic tolerance of intermittent hemodialysis in critically ill patients. Am J Respi Crit Care Med 2000;162:197-202.

**0610**

**COMPARISON OF TWO CITRATE SOLUTIONS FOR REGIONAL ANTICOAGULATION DURING HEMOFILTRATION**

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**INTRODUCTION.** Regional anticoagulation with citrate is frequently used during continuous hemofiltration. The commonly used concentrated solution of 30% trisodic citrate may result in metabolic alkalosis and hyperkalemia. A diluted solution (trisodic citrate 10 mMol/L + citric acid 2 mMol/L) has been recently developed, which can also be used as a replacement fluid. We compared the metabolic and anticoagulant effects of these two solutions. 

**METHODS.** We randomized 21 patients requiring hemofiltration with citrate anticoagulation to receive either the concentrated solution (n=10) or the diluted solution (Prismocitrate, Hospal) (n=11). In both cases, a Prismaflex device (Gambro-Hospal) was used with the following settings: blood flow 130 mL/min, hemofiltration 2500 mL/h, dialysate 1500 mL/h. The citrate was infused to achieve a target calcium concentration of 1.2 mg/dL and by NB. Acute renal dysfunction (ARD) was defined as increase in S-creatinine by & 3, 18 and 24 hrs later. NGAL was measured with ELISA (Antibodyshop, Gentofte, Denmark).

**RESULTS.** Patients characteristics were comparable for IGS II score (60,52,56 respectively for the three periods), age (64,59 and 62) and incidence of septic shock (45%,45%, 48.3%).

**TABLE 1.** IHD sessions characteristics

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| Intervention for instability | 36.2%          | 19%              | 10.54%           | <0.0001 |

**CONCLUSION.** It is possible to achieve higher ultrafiltration rates for CRRT through education and awareness and achieve a clinically significant reduction in mortality in our unit.

**REFERENCE(S).** 1. Ronco C, Bellomo R, Homel P et al. Effects of different doses in continuous veno-venous haemofiltration on outcomes of acute renal failure: a prospective randomised trial. Lancet 2000;356:26-30. 2. Wright SE, Bodenham A, Short A, Turner JH. The provision and practice of renal replacement therapy on adult intensive care units in the United Kingdom. Anaesthesia 2003;58:1036-9.
0613 INFECTION IN THE ORTHOTOPIC LIVER TRANSPLANTATION (OLT) RECIPIENT WITH ACUTE RENAL FAILURE
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INTRODUCTION. To determine which are the predictive factors for the development of infection during the post-operative period of OLT recipients that develop acute renal failure and being treated with an immunosuppressive regimen of low dose of anti calcineurin inhibitors (AC) and anti CD 25.

METHODS. A prospective study from March 1999 up to October 2004 in which we included 52 patients that developed ARF in the immediate post transplantation period. We defined ARF as levels of creatinin higher than 1.5 mg/dL and/or a creatinin clearance lower than 50 ml/min. All of them received immunosuppressive therapy with tacrolimus (FK) and corticosteroids; as soon as we discovered ARF we lowered the dose of tacrolimus to 1 mg/12 hr or we suspended tacrolimus and started with mophenolato mofetil (MMF) and a first dose of anti CD 25 (daclizumab or basiliximab), repeating the dose of daclizumab after four days and the dose of basiliximab after seven days. We used antibacterial prophylaxis during the first 5 days. Ceftriaxone, amoxycillin-Clavulanic acid and Metronidazol. For antifungal prophylaxis we used Fluconazol. We analyzed pre-, intra-, and post-operative variables.

RESULTS. In the group of patients that developed infections we observed a higher number of post-operative days, an incidence of extra corporeal renal replacement therapy, significant higher levels of AST, ALT and bilirubin during the first week post transplantation, significant lower levels of creatinine clearance and higher levels of blood glucose (p=0.002). With the regression analysis we observed the following independent risk factors for developing an infection: extracorporeal renal replacement therapy (OR=6.3, 10% 95% 1.3-26.7), p=0.01 and high blood glucose levels. We observed that the area under the curve (ROC) for blood glucose levels >140 mg/dL presents a sensibility of 75% and a specificity of 78% for developing infections (p=0.02).

CONCLUSION. A higher number of infections is seen in patients who have IHP in the post-transplantation period. Also high levels of transaminases, bilirubin and low numbers of creatinine clearance are related to a higher incidence of infections. Independent predictive factors of infection in the OLT recipient with acute renal failure are extracorporeal renal replacement therapy and high blood glucose levels.

Grant acknowledgement. This work was feasible with MMA grant.

0615 RIFLE CLASSIFICATION DOES NOT PREDICT OUTCOME IN DIALYTIC ACUTE KIDNEY DYSFUNCTION
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INTRODUCTION. The RIFLE classification was recently proposed to diagnose and stratify patients with acute kidney injury (AKI). However, the use of RIFLE as a prognostic tool still lacks validation. This study evaluates the association of RIFLE classification with the outcomes of critically ill patients with AKI in need of renal replacement therapy (RRT).

METHODS. Over one year, 214 patients with AKI in need of RRT admitted to the ICU at three hospitals were studied. Patients with end-stage renal disease requiring chronic dialysis and those with ICU stay less than 24h were excluded. AKD was classified according to RIFLE criteria. Data were collected at the start of RRT. Logistic regression was used in multivariable analysis and results are presented as odds-ratio and 95% confidence interval (OR, 95% CI).

RESULTS. The mean age was 71±15.8 years; 112 (52%) patients were males. The SAPS II and SOFA (except renal domain) scores were 47.9±10.8 and 6.0±3.1 points, respectively; 177 (83%) were on intensive care ventilation and 157 (73%) used vasopressors. The main reasons for AKI were sepsis (74%), ischemia/dock (72%) and drug/toxins (29%). Continuous RRT were initially used in 179 (84%) patients and the main indications for RRT were acidosis (72%), hyperkalemia (50%), uremia (43%) and anuria (37%). According to RIFLE criteria, patients were classified as risk (n=54;25%), injury (n=58.27%) and failure (n=102.48%). The overall mortality rate was 76% and there were no differences according to the RIFLE classification (risk=72%, injury=79% and failure=76%, p=0.681). The final model of multivariable analysis was: age (years) [OR=1.0 4 (1.01-1.31), p=0.004], need of vasopressors (OR=2.72 (0.93-7.49), p=0.053), presence of comorbidity (Charlson index >1) (OR=2.75 (1.01-7.51), p=0.048), impaired functional capacity (OR=7.69 (2.33-25.22), p=0.001) and more than two associated organ failures (OR=10.66 (2.13-53.35), p=0.001). The RIFLE classification was forced into the model and was not selected.

CONCLUSION. Age, need of vasopressors, more than two associated organ failures, the presence of comorbidity and a previous reduced functional capacity were significantly related to a higher mortality in this population. The RIFLE classification did not discriminate the prognostic in the ARF patients who underwent dialysis support in the ICU.

0616 SURVEY OF CONTINUOUS RENAL REPLACEMENT THERAPY (CRRT) IN CANADIAN INTENSIVE CARE UNITS (ICU)
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INTRODUCTION. Limited evidence exists to inform optimal CRRT delivery, and the extent of practice variability is unclear. Our objective was to describe self-reported CRRT practice in Canadian ICUs.

METHODS. We developed a self-administered questionnaire using standard survey methods, encompassing domains of dialysis mode, dose, fluids, anticoagulation, program organization, and research priorities. We identified adult CRRT programs (n=35) from 90 Canadian hospitals listed in the 2005 Canadian Organ Replacement Register. We mailed questionnaires to CRRT program directors, with 2 additional mailings and direct telephone contact for non-responders. We report proportions [categorical data] and medians (ranges) [continuous data].

RESULTS. 22 (63%) CRRT directors (16 university-affiliated) responded; each was responsible for 1 (1-4) ICUs and 18 (6-70) beds. They primarily used first generation PRISMA machines (68%). Nephrologists were predominantly responsible for initiating (63%) and discontinuing (54%) CRRT and writing non-fluid management orders (81%), while ICU nursing staff prepared solutions (81%). Most programs used M100 filters (72%), changing them after 72 hours unless they clotted (59%). They used bicarbonate-based dialysis (46%) or replacement fluid (46%) in the majority (>60%) of patients; most never used lactate-based fluids (59%). Anticoagulation for the majority of patients was heparin (50%) or citrate (18%) based. Most respondents had no specific biochemical threshold for initiating CRRT (46%). They used CVVHDF (69%) in the majority of patients and less commonly CVVHD (44%) or CVVH (44%). Most routinely prescribed <500 ml/kg/hr (63%), citing lack of confirmatory evidence or non-use of CVVH as barriers to high dose CVVH. Doses prescribed were 2 (1-2.5) L/h for CVVHD dialysate, 2 (0.7-3.5) L/h for CVVH replacement, 1 (0.5-1.5) L/h for CVVHDF dialysate, and 1 (0.75-2.0) L/h for CVVHDF replacement. Respondents identified evaluations of CRRT vs. slow low-efficiency dialysis (59%) and high vs. low dose CRRT (59%) as research priorities. Many (50%) believed that the choice of CRRT mode did not influence mortality.

CONCLUSION. Self-reported operational practice in Canadian CRRT programs is variable, with unknown impact on patient outcomes. Additional evidence to guide CRRT practice in critically ill patients is required.
0617 PROGRESSION OF ACUTE RENAL FAILURE REQUIRING REPLACEMENT THERAPY IN TRANSPLANT PATIENTS
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INTRODUCTION. Acute renal failure (ARF) requiring emergency continuous renal replacement therapy (CRRT) is associated with an excess risk of hospital mortality in critically ill patients. Transplant patients are at higher risk (7-20%) of chronic renal failure, when little is known about ARF in this population. The aim of this study was to determine whether ARF in this population is associated with different co-morbidities and prognosis.

METHODS. Review of all transplant patients admitted in medical and surgical intensive care units (ICU) requiring emergency CRRT between 1999 and 2003. Comparison of this population with a cohort of critically ill patients (n=185) requiring CRRT within the same period.

RESULTS. 459 solid organ transplantations were performed in 420 patients, and ARF requiring CRRT occurred in 32 patients, of whom 21 (66%) were transplanted within the preceding 48 hours. These recent transplants were kidney (n=3), kidney-pancreas islets (n=1), liver (n=7), lung (n=4), heart (n=5), pancreas on former kidney-pancreas islets (n=1), lung (n=2). Former transplants were kidney (n=2), kidney-pancreas islets (n=1), liver (n=4), lung (n=1) and heart (n=3). Causes of ARF were cardiocirculatory shock (n=7), septic shock (n=12), hypovolemic shock (n=10), anaphylactic shock (n=1), nephrotoxic shock (n=1), acute rejection (n=1), and hepatitis A (n=1). Some patients had two concomitant causes (n=11). No delayed function of new renal transplantations was observed. Septis was present in 16 patients during their stay. Transplant patients were similar to non-transplant patients in Apache II and SOFA scores, but they had more diabetes mellitus (28 vs 17%), after exclusion of pancreas and inlet transplant patients (n=5). Previous chronic renal failure was more prevalent, even after exclusion of recent renal transplant patients (n=2) (44 vs 29%). Though the ICU stay was longer in transplant patients, CRRT duration was similar in the two populations. One-month survival was 36% in former transplant, 48% in recent transplant patients and 49% in non transplant patients.

CONCLUSION. Transplant patients with ARF are more prone to be diabetic and to have previous chronic renal failure, possibly due to their immunosuppressive drugs. Though the retrospective design does not exclude a selection bias, one-month survival was nearly similar between recently transplanted and non-transplanted patients with ARF requiring CRRT. These data support the use of CRRT in transplanted patients with ARF.

0618 CASCADE HIGH VOLUME HEMOFILTRATION, A NEW THERAPEUTIC MODALITY FOR SEPTIC SHOCK
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INTRODUCTION. The onset of septic shock is associated with a massive release of inflammatory mediators, mostly medium size molecules (5 to 55 KD). These mediators trigger Multi Organ Failure syndrome (MOFS), a complication associated with a high mortality rate. Although recent studies showed favourable effect of high volume hemofiltration (HVHF), a new system that allows a more efficient extraction of medium size molecules by sequential filters could represent an improvement of HVHF. In addition, this new technique could be less deleterious than usual HVHF technique in respect to a lesser loss of small solutes such as vitamins, ions and drugs. The aim of this pilot study was to assess the feasibility of this cascade technique.

METHODS. Eight patients with septic shock and MOF with a SOFA score of 16.3 ± 3.4 (requiring mechanical ventilation, high doses of vasoactive drugs and renal replacement therapy) were included. Cascade HVHF (blood flow: 2.5 ± 0.5 L/min; ultrafiltration rate: 32.0 ± 8.9 ml/min) was performed, for a maximum of 72 hours, via a first high permeability filter with a cut off of 60 KD (AN69 – NEPHIRAL ST 500 – 2.15 m²) with a filtration rate of 100 ± 22 ml/kg/h followed by a second filter with a lower permeability (cut off: 5 KD) and a larger area (GFS plus 20 – HG 700 – 3.6 m²). This second ultrafiltrate containing small molecules was reinfused at a rate of 77 ± 20 ml/kg/h. Middle size molecules, which did not cross the second filter, were then discarded. Unfractioned heparin was used unless contra-indicated. Hemodynamic parameters such as blood pressure, heart rate, central venous pressure, lactate and respiratory variables were recorded during the entire treatment.

RESULTS. The duration of HVHF was 25 ± 3.8 ± 4.87 days for LDH levels.

CONCLUSION. This new modality of high volume hemofiltration with reinfusion of small size molecules and extraction of middle size molecules was well tolerated and improved hemodynamic status. These preliminary data support the evaluation of this new modality by a larger controlled trial and accurate assessment of the composition of both ultrafiltrate.

0619 INCREASING SERUM NGAL LEVELS PREDICT DEATH IN ACETAMINOPHEN INTOXICATED PATIENTS
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INTRODUCTION. The expression of NGAL (neutrophil gelatinase-associated lipocalin) increases in certain epithelia as a pathological response to stimuli such as inflammation, infection, neoplastic change, ischemia and toxic agents. This has been demonstrated in renal injury due to ischemic events or exposure to nephrotoxic agents, when the level of NGAL in urine shows a marked rise. We have measured the level of NGAL in serum from patients with acute liver failure due to acetaminophen intoxication and correlated it with outcome.

METHODS. Serum samples from 25 consecutive acetaminophen-intoxicated patients admitted to the Liver Unit, Righospital, Copenhagen, Denmark, were taken on admission and, when possible, daily until discharge. 20 patients survived without liver transplantation, 4 patients died and 1 patient underwent liver transplantation. NGAL was measured with a commercial ELISA kit (Antibody Shop AG, Copenhagen, Denmark). Data are reported as median (range) in ng/ml and were analyzed nonparametrically by the Mann-Whitney U-test for difference between groups.

RESULTS. Serum NGAL was significantly higher (p ≤ 0.0001) in acetaminophen-intoxicated patients (526 ± 139-1621) than in healthy donors (65 ± 32-200). There was no significant difference between NGAL in survivors (521 ± 139-1270) and nonsurvivors (884 ± 209-1621) on admission. During admission the NGAL of all survivors for whom more than one serum sample was available (n = 9) decreased from 660 (233-1270) to 217 (112-513). In contrast, the NGAL in the nonsurvivors for whom additional serum samples were available (n = 3) increased from 506 (209-884) to 1412 (443-1493). The final NGAL values were significantly (p ≤ 0.0019) higher in nonsurvivors than in survivors.

CONCLUSION. In this preliminary study, the NGAL level in serum from acetaminophen-intoxicated patients appeared to reflect an improving or deteriorating course and ultimately the clinical outcome. Further and larger clinical studies must be performed in order to confirm these findings.

0620 EFFECT OF PLASMA EXCHANGE ON PROGNOSIS IN PATIENTS WITH HELLP SYNDROME
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INTRODUCTION. Weinstein described a group of preeclamptic women who were associated with hemolysis, elevated liver enzymes and low platelets as HELLP syndrome. Martin described 3 risk categories of HELLP syndrome according to platelet count. Most maternal deaths occur among women with class 1 HELLP syndrome. Treatment of HELLP syndrome consists of supportive care, and most of the patients respond to this approach. However, they have failed to improve outcomes in some cases. Plasma exchange therapy was successfully used in patients who have organ failure or refractory to treatment.

METHODS. Variable numbers of plasma exchange were administered to all patients together with supporting treatment. Mortality rates, permanent organ dysfunction rates, recovery times of laboratory findings and discharged periods from the ICU were investigated. Side effects of plasma exchange were recorded.

RESULTS. Approximately 4 times of plasma exchange was performed (1-15 times). Complications due to plasma exchange were seen in 32 of 186 processes (17.2%). The most common complication was chill which was seen in 16 patients (33.3%), urticaria (11 patients, 22.9%), hematuria due to catheter (6 patients, 12.5%) and paresthesia (7 patients, 14.5%) were the other mild side effects and were easily treated. Hematexor was seen in one patient due to application. Mean thrombocyte count was 36690±814115, LDH level 4835±304272 U/L, AST level 994.46±1088.26 U/L and ALT level 461±692.77 U/L. The mean recovery times of laboratory findings were 3.44±2.46 days for ALT, 3.81±2.28 days for AST, 4.08±1.89 days for thromocyte count and 6.21±4.87 days for LDH levels. The patients were followed in the ICU for a mean of 4.81±3.77 days. None of the patients were died.

CONCLUSION. The results suggested that plasma exchange performed with fresh frozen plasma in patients with severe HELLP syndrome, had favorable effects on mortality and morbidity. Randomized studies may be beneficial for determination whether plasma exchange in early period in high risk patients of postpartum period has more advantage than the supportive treatment.

REFERENCE(S). 1. Martin J N Jr, Files J C, Blake P G, et al. Postpartum plasma exchange for atypical preeclampsia–eclampsia as HELLP (hemolysis, elevated liver enzymes, and low platelets) syndrome. Am J Obstet Gynecol. 1995;172:1107-1125.

Grant acknowledgement. The authors thank Musa Solmaz and Mehmet Oztekin for performing plasma exchange.
A total of 1558 patients were admitted to the ICU. 297 (19.1%) died before hospital discharge. The incidence of unexpected cardiac arrests was 13.8 per 1000 admissions (13 cases) falling to 1.2 per 1000 admissions (1 case) Odds Ratio 0.08 (CI 0.01-0.65) p=0.01 representing a reduction of 92% in unexpected cardiac arrest rates.

### Table 1

| Period       | Pre | Peri | Post | July/June | Aug/Sept | Oct/Nov | Dec/Jan |
|--------------|-----|------|------|-----------|----------|---------|---------|
| ICU admisions| 13  | 18.7 | 17.7 | 11.9      | 3.3      | 3.5     | 1.2     |
| Odds Ratio   | 0.42| 0.51 | 0.72 | 0.02      | 0.02     | <0.01   |

### CONCLUSION
The implementation of resuscitation guidelines and policies significantly reduces the incidence of unexpected cardiac arrests and has improved quality of care and patient safety, with minimal resourcing and cost.

### REFERENCES
1. Cardiopulmonary resuscitation – standards for clinical practice and training. London: Resuscitation Council (UK); 2004.

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**0623 A FOLLOW-UP ACTIVITY BY AN INTENSIVIST REDUCES READMISSION RATE TO CRITICAL CARE**

Cianchi G, Anichini V, Bonizzi M, Migliaccio M, Peris A

### INTRODUCTION
Patients readmitted to ICU present a higher mortality rate and a longer hospital stay. A possible solution to assure a safer discharge from ICU and to reduce the rate of ICU readmission could be a follow-up activity by an intensivist. Aim of this activity should be to verify the appropriateness of care on the ward and to support both nurse and medical ward staff. Improving the quality of care directly provided on the ward, this activity should reduce the risk of readmission. In this study we evaluated the effect on the readmission rate and over 28 days mortality of a scheduled follow-up program by an intensivist in patients discharged from an ICU.

### METHODS
We enrolled all patients discharged from an 8 bed ICU of a mixed teaching and not-for-profit hospital in Denmark. Thus ICU patients are often discharged directly to general ward. Due to periodical shortage of ICU beds (demand exceeding capacity) 183 patients (11.8%) received controlled trial, there may have been different contextual factors operating during the two time periods of data collection. Caesin data did not demonstrate any differences in the control and intervention study groups.

### RESULTS
Each site had a significant improvement in one outcome. Site A had a reduction in ICU readmissions (control 17.8%, 402/2266, intervention 11.5%, 24/209) and site B demonstrated significant improvement in hospital mortality (control 11.7%, 24/205, intervention 7.4%, 18/243). As the study was a before and after design rather than randomised controlled trial, there may have been different contextual factors operating during the two time periods of data collection.

### CONCLUSION
1. The ICU liaison nurse reduced adverse events in both sites. 2. Contextual factors may be important mediators of risk following ICU discharge.

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**0624 ICU OUTCOME: A LOOK AT CAUSES OF MORTALITY AFTER ICU DISCHARGE**

Kjarggaard M, Antonsen K

### INTRODUCTION
ICU capacity, as well as availability of intermediate beds is considered to be low in Denmark. Thus ICU patients often discharged directly to general ward. Reports have documented that this practice can be associated with increased post-ICU mortality. We wished to investigate this matter at our 9 bed multidisciplinary ICU.

### METHODS
Data analysis was performed on ICU patients admitted in 2003-2005 dying either at the ICU or the general ward before final ward discharge. Patients were screened for factors associated with increased post ICU mortality (sex, age, LOS (hospital/ICU), type of admission, chronic comorbidity, SAPS II (only 2005)) disease of degree. Charts from patients dying post-ICU were extensively reviewed and deaths were classified as expected/unexpected according to type of disease, progression and short/long term prognosis of the disease, limitations of therapy (i.e. DNR orders, decisions to discontinue or withhold active therapy.

### RESULTS
A total of 1558 patients were admitted to the ICU. 297 (19.1%) died before hospital discharge. Median age 71 yrs (9 – 93) 248 patients (15.9%) died in the ICU, 50 patients (3.2%) at the ward. Due to periodical shortage of ICU beds (demand exceeding capacity) 183 patients (11.8%) received care in other facilities than the ICU. Of these 82 was transferred to ICUs at other hospitals. Results of multiple logistic regressions analysis no riskfactor was associated with significant (p<0.05) risk of post-ICU mortality. Among the 50 late deaths 39 were discharged from the ICU with some limitation to the level of future ICU therapy (most frequently DNR orders n=22). Cases included patients with severe neurological (n=16), terminal cardiological (n=12) or terminal malignant disease (n=7). Among the remaining 11 patients 6 deaths (2% of total deaths) could be defined as truly unexpected. However they included 3 cases fully restituated from ICU care. Thus only in 3 cases it can be debated whether continued intensive monitoring could have altered the final outcome.

### CONCLUSION
Our data does not indicate substantial, unexpected, post-ICU mortality. However, capacity problems are substantial, and solved by transfer or out-facility care. This practice is untenable, and should be abandoned before firm conclusions regarding post-ICU results are drawn.
0625
REASSIGNMENT TO ICU: RELATIONSHIP BETWEEN TIME TO REASSIGNMENT, LENGTH-OF-STAY AND 90-DAY MORTALITY

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INTRODUCTION. Reassignments to ICU are associated with increased length of stay (LOS) and poor outcome. The purpose of this study was to identify the time between discharge and reassignment at which LOS and mortality approached rates for patients-at-risk for reassignment. We hypothesized that early reassignments would incur greater LOS and mortality than late reassignments.

METHODS. Patients with unplanned reassignment within 30 days of discharge from ICU were identified within the database of the Swedish Intensive Care Registry. Only the first reassignment was considered in patients with repeated reassignments. All data in the database were imported electronically to SIR after local and central validation. Vital status 90 days from last admission to ICU was secured from a national database.

RESULTS. We examined 3178 first readmissions among 65904 admissions (46 420 patients-at-risk). The implantation of the RRT reduced significantly the CA in the wards. We related the 6 months after TRR. The number of mensal CA days of discharge from ICU were identified. Patients who died foreseen in table 1. Although patients who died patients-at-risk for readmission. We hypothesized

CONCLUSION. LOS was longer in early readmissions decreasing at about 3 weeks time to reassig-

0626
RAPID RESPONSE TEAMS: IMPLANTATION AND IMPACT

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INTRODUCTION. The Rapid Response Team (RRT) have been described as a way to identification and treatment of the cardiac instability and improve the safety of the patient. The objectives are to describe the first 6 months after the implantation of a RRT, graduated in intensive care, in a general and private hospital in 2005 and evaluate the impact on the cardiac arrest rate (CA) in the ward and in the hospital ward.

METHODS. The RRT is made up of three experienced intensivist physician, summoned from clinical criteria previously established by the integrants of the ward staff. The nurses and the respiratory therapists were previously trained and participate actively in the care model. The study was prospective, controlled, and comparing the 6 months before and the 6 months after TTR. The number of CA was calculated in the number of discharges from the wards (CA/1000 discharges). Besides, the study describes the number of times the PST was summoned, the taken actions, the utilization of resources as noninvasive ventilation (NIV) and endotracheal intubation (EI).

RESULTS. During the control period 19 CA and 4900 discharges from the wards occurred (4.35 CA/1000 discharges). After the RRT the number of CA dropped to 1.57 AC/1000 discharges, 64% reduction. The hospital mortality not change (2.97%). In the period after the implantation of the RRT, 6472 patients were admitted in the ward. The RRT was summoned 554 times (85/1000 patients) and 251 reevaluations were made (3.87%) in this period. The average time between the solicitation and the beginning of the treatment was 2.4 ± 1.5 min. The age average of the patients was 69.16 years. The main reasons for the solicitations were respiratory alterations in 160 cases (35%), neurological alterations in 54 (11.8%) and pain in 43 (9.4%). 83 patients were transferred (15%): 69 (82.15) to the ICU, 14 (16.7%) to the respiratory care unit and 1 (1%) to a bed with telemetry. PST was used in 16 cases (25%) and 6 patients went through EI (9%).

CONCLUSION. The implantation of the RRT reduced significantly the CA in the wards. We relate these results mainly to the early identification of the patients in risk, to the prompt and adequate assistance to the patients and, when needed, the indication of transference of these patients to specific units. Otherwise, the absence of impact on the hospital mortality needs to be better evaluated considering the profile and the risk of the patients since several variants are involved.

0627
INTER- AND INTRA-RATER RELIABILITY OF PHYSIOLOGICAL TRACK AND TRIGGER WARNING SYSTEMS

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INTRODUCTION. Physiological bedside assessments obtained on general (non critical care) wards can be evaluated in a systematic way using track and trigger systems. Track and trigger systems allow for early identification of patients at risk of catastrophe deterioration in order to allow for early intervention by critical care teams. We set out to evaluate the inter-rater and intra-rater reliability of the physiological measurements, aggregate scores and triggering events of three physiological track and trigger warning systems.

METHODS. We performed a prospective cohort study on unsolicited patients on general medical and surgical wards in one non-university acute hospital. Four investigators (a senior physician, junior physi-
cian, senior nurse and junior nurse) examined 114 patients in the inter-rater study and 45 patients in the intra-rater study. Physiological observations obtained at the bedside were evaluated using three tools: the Medical Emergency Team call-out criteria (MET [1]), the Modified Early Warning Score (MEWS [2]) and the Assessment Score of Sick patient Identification and Step up in Treatment (ASSIST [3]). Inter- and intra-rater reliability were assessed by intraclass correlation coefficients, kappa statistics and levels of agreement.

RESULTS. There was only fair to moderate agreement in most of the physiological parameters and fair agreement on the scores, but better levels of agreement on triggers (Table). The reliability was partially a function of simplicity: MET achieved higher percentage agreement than ASSIST and ASSIST. Inter-rater reliability was better then inter-observer reliability. Using corrected calculations improved the level of inter-rater agreement.

TABLE 1

| Level of agreement of aggregate scores and trigger for inter-rater | Triggered n (%) | Kappa 95% CI | All agreed n (%) | ICC 95% CI |
|-----------------------------------------------|----------------|-------------|-----------------|-----------|
| MET trigger | 11 (2.6) | -0.03 | -0.05, 0.00 | 86 (77.48) |
| MEWS score | 0.2 | 0.13, 0.27 | 17 (15.3) | 0.45 | 0.34, 0.55 |
| MEWS trigger | 60 (14.2) | 0.18 | 0.09, 0.27 | 62 (55.86) |
| ASSIST score | 0.46 | 0.38, 0.55 | 41 (36.9) | 0.49 | 0.40, 0.57 |
| ASSIST trigger | 19 (4.5) | 0.2 | 0.04, 0.38 | 84 (75.68) |

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0628
TISS IS NOT A RELIABLE PREDICTOR OF THE LEVEL OF CARE NEEDED AFTER ICU DISCHARGE

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INTRODUCTION. A considerable number of patients who are discharged alive from the ICU will still die in the hospital. Discharge time, TISS and stepdown facilities are reported to be related to post-ICU mortality. As not all patients discharged die unexpectedly (palliation or no-readmission) we studied if TISS could indicate the level of care after ICU discharge for patients who will die unforeseen in the hospital and who will not.

METHODS. We performed a retrospective, single centre study which included all patients admitted to our ICU between 1 January 2002 and 1 July 2005. Patients <18 years of age were excluded. Patients who left the hospital alive after ICU discharge (group 1) were compared with patients who died unexpectedly in the ward or in the ICU after readmission (group 2). Factors related to post-ICU mortality like APACHE II, TISS at discharge, LOS, discharge time (office/night hrs) and discharge facility were studied.

RESULTS. Of the 1358 patients included 328 (24%) died in the ICU, 148 (11%) died after discharge from the ICU of which 97 (7%) died unexpectedly. 882 patients (65%) left the hospital alive. Risk factors associated with a higher hospital mortality are shown in table 1. Although patients who died before had a comparable TISS with patients who died unexpectedly (20±11 vs 21±10, P=0.59), they were less frequently discharged to the MCCU (55.3% vs 75.5%, P<0.000). 56.4% of group 1 patients have been discharged to a MCCU/CCU vs 63.2% of all patients who died (P=0.14).

TABLE 1

| Risk factors for post ICU mortality |
|-----------------------------------|
| pre ICU stay | Median (IQR) | LOS ICU stay | Median (IQR) | Apache II mean±SD | TISS at discharge | Mean±SD | discharged (office hrs) | discharged (weekend) | discharged to MCCU/CCU % |
|----------------|---------------|---------------|---------------|--------------------|-------------------|---------|------------------------|------------------------|---------------------|
| Group 1 n=882 | | | | 14 (8.3-7.3) | 17±11 | 74.4 | 22.4 | 56.4 |
| Group 2 n=97 | 1.3 (1.3,5) | 2.4 | 20±9±7.1 | 20±10 | 69.1 | 32.0 | 55.3 |
| p value | <0.001 | <0.001 | 0.016 | 0.157 | 0.043 | 0.003 |

CONCLUSION. Associated with in hospital mortality, this study shows that TISS at discharge is not a reliable discriminator to determine the level of post ICU care. Moreover, we found that not discharge time but in weekend discharge is associated with a higher mortality.
**Factors and Outcome Prediction for the Early Readmission to the Intensive Care Unit**

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**Introduction.** To evaluate the factors and causes associated with early readmission to intensive care units (ICU) during the same hospitalization and find out predictors for early readmission.

**Methods.** We included patients discharged alive and readmitted within 3 days from medical and surgical ICU, and coronary care unit from a tertiary teaching hospital in Korea over a 2-year period. The patients’ data were analyzed retrospectively.

**Results.** During study period, there were 14,626 admissions to the ICUs, with 229 early readmissions (1.7% of at-risk 13,382 admissions). Respiratory 71/229 and coronary 64/229 problems, in order, caused the readmission. Of these, 158/229 had recurrence of the initial problem. Among the 138 patients, coronary and cerebrovascular diseases were the most frequent diagnoses. Among the patients readmitted with a new diagnosis, 48/91 had new complications. Mortality rate was significantly higher in the patients who needed mechanical ventilation for the first time at readmission (32/42, 76.2%) than non-ventilated patients (13/112, 11.6%) or total ICU admission patients (8.5%). APACHE III score on readmission was associated with the mortality (p=0.001).

**Conclusion.** Patients with respiratory and coronary diseases are at greatest risk of early ICU readmission. Respiratory diseases are the major reason for early readmission due to new complications.

**Prevalence of ICU Readmission Patterns**

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**Introduction.** The increasing cost of ICU therapy and limited resources lead us to evaluate readmission to the ICU as a quality index of care and outcome.

**Methods.** We conducted a chart review of ICU readmissions over a 10-year period. Severity of illness was evaluated by APACHE II and SOFA scores estimation. Duration of mechanical ventilation, tracheostomy, inotropes, readmission interval and ICU LOS were used as surrogate parameters of outcome.

**Results.** The total number of ICU readmissions was 95 (2.1%) out of 4494 patients (p<.05). Within 4 days of discharge 53.3% (n=51) of readmissions occurred. Readmission was attributed mainly to cardiorespiratory deterioration in 47 patients (49.5%), neurological complications 25 (23.3%), surgical procedures 17 (17.9%) and sepsis 8 (n=9.4%). There was a statistically significant difference between groups (p=0.02). Readmitted individuals had higher APACHE II and SOFA scores compared to initial ICU admission (p=0.03). Overall mortality rate of the readmitted population was 22.1% (n=21). Oxygen mask upon ICU initial discharge, reason of readmission and SOFA 2nd score predicted 72.5% of the variance of poor ICU outcome.

**Conclusion.** Neurological problems, major general surgery and trauma were the more prominent risk factors for ICU readmission. Severity of illness, co-morbidities, presence of tracheostomy, reason and nature of readmission constituted the main determinants that affected ICU survival.

**Critical Care Outreach Team Improved Outcome of Critically Ill Oncology Patients**

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**Introduction.** Suboptimal care before referral to intensive care is associated with increased mortality (1). Patients usually must achieve a certain level of severity of illness to merit admission to ICU. It seems rational that early recognition of at-risk ward patients, followed by intervention and treatment, should improve patient outcomes (2). The aim of this study was to retrospectively audit the effects of critical care outreach team (CCO) intervention on the outcome of haematological oncology patients in comparison to other groups of oncology patients with different management.

**Methods.** Since January 2001, the Adult Leukaemia Unit (ALU) has instituted CCO, meanwhile the management of other oncology patients has been unchanged. Comparison was made between ALU patients before and after CCO introduction, and among ALU patients, medical, and surgical oncology patients, from January 1996 to December 2004. Data was retrieved on hospital survival, APACHE II score, and length of stay (LOS). Kolmogorov-Smirnov test and chi-square statistics were used as appropriate. P values <0.05 were considered significant.

**Results.** 253 patients were included into the study. Over the study period, mortality in ALU patients decreased about 36.8% which was statistically significant (Table 1). Other results did not reach statistical significance.

**Conclusion.** The introduction of CCO was associated with the significant decrease in hospital mortality in haematological oncology patients.

**The Medium Care Unit Within Developing Intensive Care; Niche or Needless?**

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**Introduction.** Critical care development has resulted in complex patient care. On general wards, patients can be identified that do not require care on an intensive care unit (ICU) but need more care than can be provided on a general ward1. Despite the suggestion that a medium care unit (MCU) promotes efficient and effective care2, few hospitals have developed such facilities. Also there is little consensus concerning MCU admission and discharge guidelines3.

**Methods.** We investigated the opinion on MCU admission criteria, MCU expansion need, the role of the ICU consultation team and possible advantages of a medical emergency team (MET) by a questionnaire presented to physicians, nursing staff and ward managers in a 852-bed teaching hospital with a 7-bed MCU. On three consecutive days, ten general wards were visited.

**Results.** Nurses and physicians defined a patient to be MCU eligible in case of medical complexity or when time consuming care was needed. Within the explored time span the need for patient transfer to the MCU was minor (4%). The percentage of MCU patients on the ward throughout the year was estimated to be 6.3% (SD 5.8%). Nurses consistently mentioned twice as much MCU eligible patients as physicians and in regard to general wards, the MCU eligibility on surgical wards was assessed twice as high. Nurses expected beneficial patient outcome from an expansion of MCU capacity (53%). The ICU consultation team was valued supplementary (40%) and the added value of a MET team was anticipated (51%).

**Conclusion.** 1) In our hospital, 6% of general ward patients were considered to require complex and lengthy care from both nurses and physicians. 2) The possibility to meet these demands, seems not only to be determined by specific patient needs, but shows to be subject to local organization, population composition, complement of nursing staff and their cumulative skills. 3) Universal criteria and guidelines concerning MCUs are yet to be developed.

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SEPSIS AND ORGAN SYSTEM FAILURE ARE MAJOR DETERMINANTS OF POST-ICU MORTALITY

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INTRODUCTION. Death on the general floor after discharge from the ICU remains a major concern. We investigated the predictors of post-ICU in-hospital mortality in a large database.

METHODS. We included patients enrolled in a large, multicenter, observational European study, the SOAP study. Data from all adult patients admitted to the participating ICUs were collected prospectively. Patients were followed up until death, hospital discharge, or for 60 days.

RESULTS. Of the 3147 patients included in the SOAP study, 1729 (54.9%) were discharged to the general floor. Overall in-hospital mortality rate was 24% (~747), 4% (~125) of deaths occurred on the floor. Non-survivors were older, had a higher incidence of hematologic cancer and cirrhosis and greater SAPS II score and (SOFA score on ICU admission, and were more likely to have been admitted for medical reasons than survivors. Residual organ dysfunction/failure on discharge to the general floor was more pronounced in hospital non-survivors than survivors, as reflected by a greater SOFA score on the day of ICU discharge. In a multivariate analysis with hospital mortality as the dependent variable, age (Odds ratio (OR): 1.04, 95% confidence interval (CI): 1.02-1.06, p<0.001), hematologic cancer (OR: 3.7, 95% CI: 1.52-9.1, p<0.001), cirrhosis (OR: 4.7, 95% CI: 2.07-10.92, p<0.001), SAPS II score on admission (OR: 1.04, 95% CI: 1.03-1.06, p<0.001), medical admission (OR: 1.9, 95% CI: 1.26-3.0, p=0.003), the presence of sepsis at any time during ICU stay (OR: 2.3, 95% CI: 1.51-3.81, p<0.001), and organ dysfunction at ICU discharge; SOFA hepatic (OR: 1.58, 95% CI: 1.25-2.0, p<0.001), SOFA CNS (OR: 1.48, 95% CI: 1.21-1.81, p<0.001), SOFA renal (OR: 1.2, 95% CI: 1.04-2.13, p=0.014) were all independently associated with a greater risk of post-ICU death.

CONCLUSION. In addition to age, medical admission, and pre-existing comorbidities on ICU admission, sex and/or organ system failure are independently associated with a greater risk of post-ICU death.

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LEVOSIMENDAN REDUCES THE PRODUCTION OF REACTIVE OXYGEN SPECIES BY PMN

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INTRODUCTION. Levosimendan is a new inodilator for primary cardiac failure acting by sensitizing potassium channels. Levosimendan has also been shown to exhibit immunomodulatory effects which may be an additional pathophysiological mechanism preventing abnormal immune responses in severe heart failure. This study aimed to investigate the effect of Levosimendan on polymorphonuclear leukocytes (PMN).

METHODS. PMN were obtained from venous blood from healthy volunteers. Isolated PMN were incubated with increasing concentrations of ROS production in PMA- stimulated PMN (32% reduction at a concentration of 25 ng/ml, p< 0.05). In contrast, Levosimendan did not have an effect on ROS production. PMN could be observed at a concentration of 25ng/ml for 2 hours. Afterwards PMN were exposed to fMLP (formly-Met-Leu-Phe) (4 hours). Appropriate descriptive statistics were calculated, comparisons between groups were performed using Chi-square test, non-parametric Mann-Whitney U or Kruskal-Wallis tests as appropriate. For hypothesis testing a value of P<0.05 was considered significant. Statistical analysis was performed with SPSS 14.0® software package.

RESULTS. From the total of 511 patients admitted, 109 (21%) patients died in the ICU. Four patients were discharged directly to their home, and 20 records were lost. From the 378 patients discharged from the ICU, 41 (11%) died in the ward before hospital discharge implying a global hospital mortality of 29%. All patients were discharged from ICU to an intermediate care unit before being discharged to the ward. Patients who died after ICU discharge exhibit a significantly higher age (median 70 years old vs 61 years; p<0.002), a significantly higher SAPS II (median 44 vs 35; p<0.001) and a significantly longer ICU stay (median 7 vs 5; p<0.001) than patients who were discharged alive from hospital. There were no significant differences concerning gender, reason for ICU admission, TISS 28 and SOFA score in the last 24 hours before ICU discharge.

CONCLUSION. Post-ICU mortality was associated with a higher age, a higher burden of disease at ICU admission, and a longer ICU stay. The main factor we think explains the lower post-ICU mortality found in our study, compared with other studies, is the systematic discharge from ICU to an intermediate care unit that we have implemented in our institution.

INTRODUCTION. In 11 anesthetised juvenile pigs, LV mechanical dysfunction was assessed by analysis of long axis segmental volumes measured using a 5 segment conductance catheter (2). Endotoxin was infused intravenously at 0.25 mcg/kg/hr, together with intravenous fluid resuscitation (Ringers acetate, 20 ml/kg/hr). Systolic intraventricular internal flow fraction (IFF) and segmental dysynchrony fraction (DF) were measured before and during endotoxin infusion.

RESULTS. Approximate doubling of MPAP reflects a significant increase in right ventricular (RV) loading during endotoxin infusion. Both systolic DF and IFF increased during peak endotoxin MPAP effects during the first hour, but had even higher mean values after 3 hours of endotoxin exposure.

TABLE 1.

| MAP (mm Hg) | 99±3 | 88±3 | 95±2 |
| MPAP (mm Hg) | 22±2 | 45±3 | 42±3 |
| CO (liter/min) | 5.6±0.4 | 5.0±0.4 | 5.0±0.4 |
| Systolic DF (%) | 7.5±1.2 | 9.8±1.3 | 11.0±1.1 |
| Systolic IFF (%) | 5.6±1.2 | 11.1±2.5 | 13.1±2.6 |

mean values ± SEM, * denotes p< 0.05 in paired t test vs. control

CONCLUSION. Mechanical dysynchrony increases in the LV during acute pulmonary hypertension related to endotoxin infusion in this animal model. The exact mechanism and clinical relevance of LV dysynchrony during early sepsis is not yet clear.
**0637 TEMPORAL VARIATION IN THE PHARMACOLOGY OF THE KATP CHANNEL IN AN IN VIVO MODEL OF SEPSIS.**

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INTRODUCTION. Abnormal activation of the ATP-sensitive potassium (K<sub>ATP</sub>) channel contributes to vascular hyperreactivity in sepsis. We have suggested this is due to dysfunctional regulation of the ion current mediated by the sulphonylurea receptor subunit (SUR). Altered levels of ATP and the ADP:ATP ratio in vascular smooth muscle may be responsible for this dysregulation, though nucleotide levels have not been previously measured in this setting.

METHODS. At 24 hr and 48 hr timepoints in an in vivo rat model of facelift botulinum, animals were anaesthetised and the thoracic and abdominal aorta removed. Thoracic aorta was flash frozen in liquid N<sub>2</sub> and ATP, ADP and AMP levels later measured using HPLC. Rings of abdominal aorta were placed in an organ bath. Contractility to the alpha-agonist phenylephrine (PE,10<sup>-7</sup>–10<sup>-10</sup> M), and relaxation to the K<sub>ATP</sub> channel opener levomexalakalin (10<sup>-7</sup>–10<sup>-4</sup> M), were measured using the K<sub>ATP</sub> channel. In separate studies, the pore-blocker PNU 37883A (10<sup>-6</sup> M), and the SUR inhibitor glibenclamide (10<sup>-5</sup> M) were added to pre-contracted rings (using PE,1uM) which were then relaxed with levomexalakalin (1uM). This enabled assessment of the ability to block the channel via either the pore or SUR.

RESULTS. Abdominal aorta from septict rats were hyperreactive to PE at 24 hr and 48 hr (n = 4, P < 0.05), with increased levomexalakalin efficacy at both 24 hr (IC<sub>50</sub>: 1.9 ± 3.4 x10<sup>-5</sup> M, N = 4, P < 0.001) and 48 hr (IC<sub>50</sub>: 1.1 ± 2.3 x10<sup>-5</sup> M, N = 4, P = 0.02). Surprisingly, the potency of both PNU 37883A (38% vs 90% reversal, n = 5, P < 0.05) and glibenclamide (6% vs 50% reversal, n = 5, P < 0.001) were reduced at 24 hr, but not 48 hr. ATP, ADP and AMP levels were unchanged at 24 hr.

CONCLUSION. Glibenclamide did not close the K<sub>ATP</sub> channel in aorta taken from this in vivo model at 24hr. This finding is consistent with a recent study in septic shock patients. The pore-blocker also failed to close the channel at this timepoint. However, the ability of these agents to close the channel was regained at 48 hr. This may be due to either reversal of the mechanism present at 24 hr, or to synthesis of new K<sub>ATP</sub> channels. The data also demonstrate that the reduced potency of the channel closers at 24 hr is independent of nucleotide phosphate levels. In summary, different mechanisms are responsible for vascular hyperreactivity during the septic process.

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**0638 HUMAN INTESTINAL MUCOSAL PERFUSION IN VASODILATORY SHOCK.**

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INTRODUCTION. Clinical septic shock and the vasodilatory shock syndrome after cardiac surgery are characterized by a profound arterial vasodilatation. Data on intestinal mucosal perfusion in patients with vasodilatory shock are lacking.

METHODS. Ten patients with vasodilatory shock treated with norepinephrine (NE) after cardiac surgery were compared to ten uncomplicated cardiac surgery patients. NE was titrated to an arterial base deficit of ≤ 10 mmol/L and arterial lactate of ≤ 4.0 mmol/L (balanced with saline). Global O2 extraction (%), systemic oxygen consumption (26%, p<0.001) and delivery (17%, p<0.05) were higher while systemic vascular resistance index (-14%, p<0.05) was lower at 24 hr. This suggests that the increased arterial base deficit can be explained by a combination of increased O2 consumption and decreased O2 extraction.

RESULTS. Infusion rate of NE was 0.38 ± 0.23 microg/kg/min. Cardiac index (CI), heart rate (HR), arterial lactate (ALT), and gastric O2 extraction were higher in the vasodilatory shock group (31 pts) received isotonic saline at the same dose. We investigated erythrocytic rigidity index, blood and plasma viscosity, intravascular aggregation and stromycin plateglet aggregation. RESULTS. It was established that within the first 48 hrs after injury and blood loss there were worse microvascularological parameters, which appeared as the increased erythrocytic rigidity and aggregation. At the same time blood and plasma viscosity were decreased as a result of fluid therapy. Perfluoran caused significant decreases ristomycin plateglet aggregation during 2 hours after administration (p<0.05; t-test). Erythrocytic rigidity, intravascular aggregation and plasma viscosity also decreased compared to control (p<0.05). These changes were observed for 24 hours after perfluoran administration. Blood viscosity did not differ between groups. Analysis of the treatment results revealed significant reducing the incidence of thrombin and thrombembolic complications in patients treated by perfluoran.

CONCLUSION. 1) Perfluoran used in a dose 6-10ml/kg in patients with severe injury and blood loss improved blood pathological properties by stabilizing the microcirculation indices-erythrocytic rigidity and aggregation and by decreasing plasma viscosity. 2) The administration of perfluoran in the acute period of injury made it possible to reduce the incidence of thrombin and thrombembolic complications.

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**0639 BLOOD RHEOLOGICAL EFFECTS OF PERFLUORANE IN PATIENTS WITH SEVERE INJURY AND BLOOD LOSS.**

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INTRODUCTION. Changes of blood rheology occurring in the acute period of injury and blood loss are the closely related to different thrombotic and thrombembolic complications. The aim of this study was to investigate the blood rheological effects of perfluorane in patients with severe injury and blood loss.

METHODS. We examined and treated 64 patients with severe injury. All of them received a colloid and cristalloid solutions. Perfluorane (6-10 ml/kg) was added to 33 patients (study group). A control group (31 pts) received isotonic saline at the same dose. We investigated erythrocytic rigidity index, blood and plasma viscosity, intravascular aggregation and stromycin plateglet aggregation.

RESULTS. It was established that within the first 48 hrs after injury and blood loss there were worse microvascularological parameters, which appeared as the increased erythrocytic rigidity and aggregation. At the same time blood and plasma viscosity were decreased as a result of fluid therapy. Perfluoran caused significant decreases ristomycin plateglet aggregation during 2 hours after administration (p<0.05; t-test). Erythrocytic rigidity, intravascular aggregation and plasma viscosity also decreased compared to control (p<0.05). These changes were observed for 24 hours after perfluoran administration. Blood viscosity did not differ between groups. Analysis of the treatment results revealed significant reducing the incidence of thrombin and thrombembolic complications in patients treated by perfluoran.

CONCLUSION. 1) Perfluoran used in a dose 6-10ml/kg in patients with severe injury and blood loss improved blood pathological properties by stabilizing the microcirculation indices-erythrocytic rigidity and aggregation and by decreasing plasma viscosity. 2) The administration of perfluoran in the acute period of injury made it possible to reduce the incidence of thrombin and thrombembolic complications.

Grant acknowledgement.
DIFFUSE MICRO-OXYGENATION IMPAIRMENT IN ACUTE HAEMORRHAGIC SHOCK

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INTRODUCTION. We study the micro-oxygenation impairment of peripheral muscle in post-partum haemorrhagic shock.

METHODS. Tissue oxygenation and perfusion of thenar muscle were assessed using near infrared spectrometry technique (NIRS) at ICU admission in 33 consecutive post-partum haemorrhagic shock women. Tissue O2 saturation was measured at baseline (SO2) and following forearm arterial occlusion. The slope of the decrease in SO2 during occlusion (S-Occ), the slope of the increase in SO2 following occlusion release (S-Rel) and the deficit of post-ischemic oxygenation recruitment (Deficit) in response to transient ischemia were measured. The haemorrhagic shock group (HEMORRHAGE) was divided accordingly to myocardial ischemia defined by a Troponin I value above 0.08 ng/ml (TROPO+) and TROPO-). Values obtains in a control group of 11 post-partum women with normal delivery (CONTROL) were used for comparison.

RESULTS. Tissue oxygenation and perfusion were significantly impaired in HEMORRHAGE group but an additional impairment was observed in TROPO+ sub-group only for S-Occ and S-Rel (p<0.004 et p<0.0001 respectively). In multivariability analysis, the increase in lactate acid and the decrease in S-Rel were the two independent factors associated to Troponin I elevation (p=0.04).

| TABLE 1. |
|-----------------|-----------------|-----------------|-----------------|-----------------|
|                  | CONTROL (11)    | HAEMORRHAGE (n=20) | HAEMORRHAGE (n=13) | Anova p        |
| SO2 (%)         | 87 (4)          | 51 (5)           | 77 (5,5)         | 0.03          |
| Deficit (%)     | 2 (1)           | 5 (1,2)          | 10 (11)          | 0.008         |
| S-Occ (%)/mmHg  | -28 (7)         | -20 (9)          | -13 (6)          | <0.0001       |
| S-Rel (%)/mmHg  | 453 (107)       | 328 (92)         | 156 (95)         | <0.0001       |

CONCLUSION. Post-partum acute haemorrhage cause diffuse hypo perfusion with myocardial ischemia and dysfunction of micro-vascular pathway of the peripheral muscle. This disease of the tissue appears in spite of aggressive cares. Local monitoring of tissue oxygenation and perfusion with thenar NIRS highlights the interest of tissue perfusion optimization as a therapeutic resuscitation goal in haemorrhagic shock patients.

Grant acknowledgement. supported by HUNTINGSON Technology Inc
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LEVIOSIMENDAN IMPROVES EXTRAVASCULAR LUNG WATER IN CARDIOGENIC SHOCK: A RENAL PROTECTIVE EFFECT?

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INTRODUCTION. Leviosimendan (LS) improves survival in patients with congestive heart failure and seems to improve also renal function by a vasorelaxant effect 1. As clinical data on fluid balance are scanty the aim of this study is to evaluate in cardiogenic shock -3 the haemodynamic and volumetric response to LS 2 the changes of extravascular lung water (EVLWI) 2-the effect of LS on diuresis.

METHODS. 20 critically ill patients with cardiogenic shock were studied. All patients were mechanically ventilated and connected to an integrated monitoring system (PICCO system/Agilent) by a fiberoptic arterial catheter (p5 201416) and by a Swan-Ganz catheter. In all patients LS was infused at 20 mcg/kg/min in 20 minutes and then at 0.1 mcg/kg/min for 24 hours. At basal time (T0), 6 hours (T1),12 hours (T2), 24 hours (T3) during LS infusion the main haemodynamic and volumetric data were evaluated. All data are expressed as mean ± SD. ANOVA test for RM was used to compare changes during times study. P<0.05 was statistically significant.

RESULTS. Table 1 presents the main hemodynamic, volumetric data and 24 hours diuresis.

| TABLE 1. | T0 | T1 | T2 | T3 |
|----------|----|----|----|----|
| CI (min/m2) | 2.0±0.4 | 2.6±0.3* | 2.5±0.4* | 2.6±0.2* |
| PCWP (mmHg) | 20±7 | 10±5* | 12±2* | 14±3 |
| ITVBI (ml/m2) | 888±180 | 849±142 | 731±130* | 822±160 |
| EVLWI (ml/kg) | 14±2±2* | 11.7±5.5 | 9±2±2* | 9.2±2±2* |
| Diuresis ml 24 Hours | 364±150 |

* p<0.05 ** p<0.01 vs basal time

CONCLUSION. (1) LS increases the Cardiac Index and improves the filling pressures. (2) This improvement correlates with decreases of ITVBI and lung edema. (3) As cardiac improvement is accompanied by decreasing of EVLWI and by normalization of diuresis also a renal protective effect of LS may be hypothesized.

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0647

DIHYDRALAZINE - BUT NOT NITROGLYCERINE - INCREASES GASTRIC MUCOSAL OXYGENATION IN DOGS

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INTRODUCTION. Adequate microvascular oxygenation of the gastrointestinal mucosa is crucial to maintain an intact mucosal barrier function [1]. The effects of vasodilating drugs on the gastric mucosal microvascular hemoglobin oxygenation (HbO2mc) is unclear. Thus we studied the effects of the vasodilators dihydralazine and nitroglycerine on HbO2mc in anesthetized dogs.

METHODS. Chronically instrumented dogs (~30 kg bodyweight, n=12 experiments, with permission) were anesthetized (propofol 15 mg/kg/h) and mechanically ventilated (FiO2 0.3, etCO2 35 mmHg). We measured systemic hemodynamics (mean arterial blood pressure, MAP), systemic oxygen delivery (DO2) and regional microvascular hemoglobin oxygenation of the gastric mucosa (HbO2mc, reflection spectrophotometry, EMPHO-II). After a stabilization period and obtaining baseline values, equi-potent doses of dihydralazine and nitroglycerine were infused. Statistics: Fisher’s PLSD and t-test, p<0.05.

RESULTS. In equi-potent doses (MAP from ~80 to ~65 mmHg in both groups, no difference between groups) only dihydralazine increased HbO2mc (from 64±2 to 70±2%), whereas nitroglycerine had no effect (63±2 to 63±3%). At the systemic level, only dihydralazine increased DO2 (from 201±2 to 261±2 ml/kg/min), whereas nitroglycerine had no effect (141±1 to 161±2 ml/kg/min). Arterial pH (~7.37) and lactate (~1.9 mmol/l) remained stable in both groups.

CONCLUSION. If our results may be transferred to the clinical setting, then dihydralazine -in contrast to nitroglycerine- may improve gastrointestinal mucosal oxygenation and thereby support an intact gastrointestinal barrier function in patients at risk.

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0648

NORMOBARIC HYPEROXIA DOES INCREASE OXYGENATION OF THE LIVER, BUT NOT OF THE INTESTINAL MUCOSA

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INTRODUCTION. Splanchnic hypoxia, especially of the intestinal mucosa may be a major contributing factor to the development of systemic inflammatory response syndrome (SIRS) and sepsis 1. Increasing the arterial oxygen partial pressure might avoid or at least to attenuate splanchnic hypoxia. However, there are no data available describing the effect of increased arterial oxygen partial pressure on splanchnic tissue oxygenation.

METHODS. Following approval by the local animal ethics committee 10 anesthetised, ventilated and acutely instrumented pigs (catheterisation of pulmonary artery, portal vein, hepatic vein and femoral artery catheter, intestinal tonometry and pO2-electrode onto liver, intestinal serosa and mucosa, ultrasonic flow probes around hepatic artery, sup. mesenteric artery and portal vein (2,3)) were treated with dihydralazine -in contrast to nitroglycerine- may improve gastrointestinal mucosal oxygenation and thereby support an intact gastrointestinal barrier function in patients at risk.

RESULTS. Table 1

| TABLE 1. | PaO2 [kPa] | MAP [mmHg] | CI [ml/min/kg] | P02 serum [mmHg] | P02 mucosa [mmHg] | P02 liver [mmHg] | PDR ICG [%] |
|----------|-----------|----------|-------------|--------------|---------------|---------------|----------|
| 15 kPa   | 16.9±(15.9-20) | 87(79-98) | 169(146-175) | 73 (69-75) | 29 (27-34) | 59 (57-68) | 17.1 (15.8-18.6) |
| 25 kPa   | 26.3±(24.3-29.9) | 92(86-99) | 128(117-137) | 113(93-114) | 31 (25-39) | 104 (91-120) | 20.4 (18.6-21.9) |
| 45 kPa   | 45.3±(44.2-46.8) | 93(87-99) | 144(118-161) | 137(127-163) | 26 (25-37) | 174 (119-192) | 21.1 (19.1-22.0) |
| 65 kPa   | 65.6±(63.8-68.5) | 87(83-97) | 139(123-160) | 166(158-190) | 26 (24-43) | 178 (169-188) | 20.5 (18.3-21.1) |

All data are medians with 25-75% interquartile range, Wilcoxon’s signed rank test

CONCLUSION. Systemic arterial hypoxia increases partial pressure dependent tissue oxygenation of liver and serum, but the increase in arterial PaO2 is not reflected by an increase in intestinal mucosal tissue oxygenation. In acutely instrumented pigs the intestinal mucosa does not benefit from normobaric hypoxia.

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REFERENCE(S). (1) Pastores, Am J Gastroenterol 1996;91:1697-1710 2) Vagts, Eur J Anaesth 2005;22:879-866 3) Kessler, Anesthesiology 1976;45:184-197.
EXTRACORPOREAL CARDIOPULMONARY SUPPORT FOR CARDIOGENIC SHOCK CAUSED BY PHEOCHROMOCYTOMA: CASE REPORT

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INTRODUCTION. Pheochromocytoma is classically associated with paroxysmal hypertension but can present with various non-specific clinical manifestations. A 53-year-old woman came to the ED for epigastric-retrosternal discomfort, right lumbar pain, vomiting and impending sense of doom. BP was 90/50, HR 120, Tt 38.9°C. The patient rapidly developed cardiogenic shock with respiratory failure, DIC, massive rhombomylsis with acute renal failure and hepatic cytoplasia. CT showed bilateral pleural effusions with basal infiltrates and a right suprarenal mass. Echocardiography showed severe biventricular dysfunction. Despite massive supportive refractory shock with elevation of ventricular filling pressures ensued. To unlock the failing heart, veno-arterial extracorporeal bypass was started.

METHODS. A 24 F cannula was positioned percutaneously into the right femoral vein, and a 13 F arterial catheter was inserted into the right femoral artery. Venous blood was drained using a centrifugal pump (Josta Rotaflo, Maquet), passed through an artificial lung (Josta Quadrox, Maquet) and then returned into the arterial circulation. Extracorporeal blood flow was set to 5 L/min and gas flow through the artificial lung to 6 L/min of oxygen. Anticoagulation was maintained with continuous infusion of unfractionated heparin. Liver function was monitored with iGClearance (LiMon, Pulsson).

RESULTS. Rapid hemodynamic improvement was observed, with reduction of filling pressures, increase of SVR and correction of lactic acidosis. Treatment with vasopressor drugs was discontinued. Only after institution of the bypass wide fluctuations in blood pressure (typical of pheochromocytoma) became evident and were treated with phenolamine. After 4 days the EC support was discontinued and the patient underwent definitive treatment of the tumor (angiographic embolization followed by right adrenalectomy). After removal of the tumor CVVH was discontinued and a liver function progressively improved. Discharge from ICU was 29 days after admission.

CONCLUSION. This is the second report of a pheochromocytoma-induced refractory cardiogenic shock successfully treated with extracorporeal cardiopulmonary support.

EXAMINATION OF HEMODYNAMIC MONITORING USING PICCO (PC) AND TASK FORCE MONITOR (TFM)

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INTRODUCTION. Swan-Ganz catheter (S-G) is mostly used for hemodynamic monitoring. EVLWI can be considered as an alternative of S-G for hemodynamic monitoring. EVLWI is measured using the artificial lung to 6 L/min of oxygen. Anticoagulation was maintained with continuous infusion of unfractionated heparin. Liver function was monitored with iGClearance (LiMon, Pulsson).

In 2005, a total of 333 echocardiography examinations were performed on 189 patients (pts) in ICU and in operating room (Intensive Care Med 2005;31:1195. Br J Anaesth 2002;88:616). We evaluated the ability of ED to assess vascular fluid responsiveness in pts undergoing spinal surgery (SS) in prone position (PP).

METHODS. After approval of the local Ethical Committee and informed consent 26 pts (52±16 yrs, 12 M/14 F, ASA grade 1-2) were admitted for SS with laminectomy. After induction (target-controlled infusion of propofol (1.6 - 4 mg/kg) and remifentanil (0.1 - 0.4 mcg/kg/min)) a TED probe (ODM2, Deltras Medical, UK) was inserted through the nasopharynx. A vascular fluid challenge (PC) (200 ml Voluven®) over 10 min was achieved while the pt was in PP, with no administration of vasoactive drugs. We measured and calculated TED parameters. Data (mean ± SD) obtained before and at the end of PC were compared by paired Student’s t-test (p<0.05).

RESULTS. All variables increased significantly after PC while Mean-Arterial Pressure (MAP) and HR remained unchanged (Table). There was a large interindividual variability among pts. Defining responder pts (PP>15) according to their DeltaSV>10%, there was no significant difference between RP and non RP (n=11) before PC.

TABLE 1. Effects of fluid infusion (FI) on aortic haemodynamics (* p<0.05 vs. before FI)

| Parameter               | Before FI | After FI | Delta (% of pre-FI values) |
|-------------------------|-----------|----------|---------------------------|
| Cardiac Output (l/min)  | 4.3 ± 1.2 | 5.3 ± 2.1*| +22 ± 25%                 |
| Stroke Distance (cm)    | 12.1 ± 5.1| 13.8 ± 5.4*| +17 ± 18%                 |
| Stroke Volume (ml)      | 65.5 ± 23.2| 75.8 ± 29.9*| +17 ± 18%                 |
| corrected Flow Time (ms)| 312.7 ± 51.3| 331.5 ± 48.6*| +7 ± 10%                  |
| Mean Acceleration (m/s²)| 7.5 ± 2.6 | 8.6 ± 2.6*  | +15 ± 48%                 |
| Aortic Peak Velocity (m/s)| 67.2 ± 21.6| 73.6 ± 23.7*| +13 ± 22%                 |
| Heart Rate HR (min)     | 69.7 ± 14.2| 69.9 ± 14.4| +8 ± 10%                   |
| MAP (mmHg)              | 70.6 ± 10.3| 75.0 ± 13.5| +7 ± 21%                   |

CONCLUSION. It is possible to use TEG as a non-invasive monitor of aortic haemodynamics in PP. Our results show that effects of PC can be monitored using TEG, resulting here in a decrease in vascular systemic resistances. Although TED cannot predict the individual responsiveness to PC, this technique can guide fluid optimization during SS.

BEDSIDE HEMODYNAMIC ASSESSMENT: MODIFICATION OF PRACTICE IN A MEDICAL INTENSIVE CARE UNIT

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INTRODUCTION. Progressively the use of transthoracic echocardiography (TTE) or transesophageal echocardiography (TEE) becomes a routine approach for bedside hemodynamic assessment in intensive care unit (I.C.U). The aim of the study was to analyze the evolution of the different types of hemodynamic examination, in our unit during the 4 last years.

METHODS. We retrospectively recorded all echocardiography procedures performed by intensivists, and all invasive hemodynamic assessment using either right heart catheterization (RHC) or PICCO (Pulsion, Germany) from 2001-2002 to 04-2006.

RESULTS. In 2005, a total of 333 echocardiography examinations were performed on 189 patients (141 TTE, 192 TEE). Indications were 27% septic shock, 22% ARDS, 10% acute respiratory failure, 9% cardiac arrest, 5% acute myocardial infarction, 7% endocarditis, 5% renal failure, 4% intoxication, 9% other.

CONCLUSION. In our medical intensive care unit, echocardiography has become the routine tool for hemodynamic assessment and allowed to reduce invasive assessments.

REFERENCE(S). 1/ Hemodynamic instability in sepsis Veillard-Baron A, Prin S, Chergui K, Dubourg O, Jardin F AIRCCM 2003 168, 1270-1276 2/ Cholley B, P. Veillard-Baron A, Mebazaa A, Echocardography in the ICU: time for widespread use! Intensive Care Med. 2006 Jan;32(1):9-10. 

TABLE 1.

| Patients (%)          | 2002 | 2003 | 2004 | 2005 | 2006 (3 months) |
|-----------------------|------|------|------|------|-----------------|
| Patients (n)          | 360  | 435  | 513  | 540  | 156             |
| RHC (n)               | 33   | 31   | 14   | 9    | 0               |
| PICCO (n)             | 40   | 35   | 85   | 35   | 0               |
| TEE done by intensivists (n) | 9   | 19   | 17   | 133  | 79              |
| TEE done by intensivists (n) | 28   | 38   | 139  | 32   | 0               |
| Intensive echo training (n) | 0   | 0    | 1    | 1    | 1               |

CONCLUSION. In our medical intensive care unit, echocardiography has become the routine tool for hemodynamic assessment and allowed to reduce invasive assessments.

REFERENCE(S). 1/ Hemodynamic instability in sepsis Veillard-Baron A, Prin S, Chergui K, Dubourg O, Jardin F AIRCCM 2003 168, 1270-1276 2/ Cholley B, P. Veillard-Baron A, Mebazaa A, Echocardography in the ICU: time for widespread use! Intensive Care Med. 2006 Jan;32(1):9-10.
0653 NOVEL PARAMETER EXTRACTION AND SPECTRAL ANALYSIS TECHNIQUES IN EXPERIMENTAL VERAPAMIL POISONING

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INTRODUCTION. Verapamil (Vr) causes negative inotropy by antagonism of L-type calcium channels and vasodilatation by agonism of vascular potassium channels, resulting in severe hypotension. Levosimendan (Lv) is a calcium (Ca) sensitizer that increases inotropy by binding to troponin-C, and causes vasodilatation by agonism of vascular potassium channels. Frequency domain analysis (FDA) theory predicts low frequency (LF) oscillations exist in the cardiovascular system (CVS) related to autonomnic control. The objective of this study was to elucidate CVS mechanisms in a model of calcium channel blocker poisoning treated with Lv and Ca boluses, by parameter extraction and FDA.

METHODS. 5 anesthetised rats were infused with Vr, followed by Lv and calcium chloride (CaCl2) boluses. Mean arterial pressure (MAP) and contractility index (dP/dt max) were extracted from the femoral artery BP waveform, and thermocoupled CO recorded. Systemic vascular resistance (SVR) was calculated as MAP/CO, a ratio of MAP and dP/dt max (MAP–dP ratio) being used as a proxy of SVR. Cross-spectral analysis was carried out and low frequency (LF) transfer gain from dP/dt max to MAP computed as a marker of LF systemic vascular impedance (LF SVZ). Results were compared across 3 stages: 1) baseline 2) post Vr 3) post Lv/ CaCl2.

RESULTS. Vr caused a decrease in MAP (+52.6±3.8%), contractility (-45.2±22.4%) and CO (-38.3±19.9%) from stage 1 to stage 2 (p < 0.05). Lv/ CaCl2 combined restored contractility (92.6±34.4%) and CO (64.6±24.2%) compared with stage 2 (p < 0.05), but was poorly effective in restoring MAP, mainly due to a progressive decrease in SVR (-52.9±18.1%) from stage 1 to 3 (p < 0.05), as a combined effect of Vr and Lv/ CaCl2. The decrease in SVR was accompanied by the decrease in MAP–dP (+54.8±17.2%) and LF SVZ (+70.4±15.5%) (p < 0.05).

CONCLUSION. Features derived from the ABP waveform (dP/dt max and MAP–dP ratio) may be clinically valuable when continuous CO measurements are not available. FDA demonstrated drug-induced reduction in LF SVR, probably caused by decreased sympathetic influence on peripheral vascular tone.

0654 INDOXYLANE GREEN ELIMINATION (LIMON®) IN PATIENTS WITH INTRAABDOMINAL HYPERTENSION

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INTRODUCTION. Increased intrabdominal pressure (IAP) impairs splachnic perfusion with risk of multiorgan failure. LIMON® monitor allows a bed-sided manner to determine the function.

METHODS. 8 patients (3male/5female) presented IAH (> 15 mmHg). PDR, R15, ASAT, ALAT and bilirubin were monitored for 7 days. We registered ICU stay, APACHE II, daily SOFA and mortality.

RESULTS. Dead patients had PDR<16 after 7 days. In cases 2 and 8 LIMON® detected early dysfunction allowing to optimize the treatment by improving the haemodynamics.

| Table 1 | End Day 1 | Day 1 Bilirubin | Day 1 ASAT | Day 7 PDR-R15 | Day 7 Bilirubin | Day 7 ASAT |
|---------|-----------|----------------|------------|---------------|----------------|-----------|
| Case 1  | Alive     | 19-34.3-0.6    | 0.3        | 20-32         | 15-28.3-1.4    | 0.8       |
| Apechel 14 | Alive     | 20-21.4-4      | 2.4        | 25-54         | 18-20.9-4      | 2.9       |
| Case 2  | Alive     | 19-8.7-3.9     | 1.8        | 28-26         | 18-7.1-3.9     | 4.7       |
| Apechel 21 | Alive     | 18-24.2-4.7    | 0.2        | 69-47         | 13-24.2-5      | 1.3       |
| Case 3  | Dead      | 25-14.9-10.1   | 1.9        | 3814-2725     | 24-16.9-1      | 9.2       |
| Apechel 35 | Alive     | 19-5.1-5.6     | 2.9        | 93-22         | 19-5.4-4.0     | 30.1      |
| Case 7  | Alive     | 16-31.0-0.6    | 0.5        | 21-8          | 15-39.1-0.3    | 0.4       |
| Apechel 9 | Alive     | 17-15.2-2.9    | 1.5        | 18-12         | 14-31.3-0.6    | 1.2       |

CONCLUSION. LIMON® allows a bed-sided quantification of the hepatic affection before biochemistry is altered. Low PDR and R15 are reported as bad prognosis for critically ill, but it should be tested with larger studies in more situations with IAH.

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0655 MINNESOTA SEDATION ASSESSMENT TOOL (MSAT) VS NARCOTEND (NT) TO MONITORIZE ANALGO-SEDATION IN ICU

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INTRODUCTION. Our aims were to validate the role of Narcotend (NT) for monitoring the sedation and assessment in critically ill patients and to compare it with an international score as MSAT.

METHODS. 32 patients were enrolled, admitted to ICU more than 48 hours, treated with midazolam (M) or xilozol (X) (0.15±0.03/mm/kg/h) followed by continued infusion of M (0.03±0.066/mm/kg/h) and remifentanil (R)(0.05±0.01mm/kg/min) according to international guidelines. We monitored SpO2, NIBP, EtCO2, HR, and esophageal T. NT and MSAT values were registered, like coupled data, each 5 min after pain stimulation (PS) (endotracheal aspiration) until 40 min. We considered an adequate stage of analgo- sedation for NT index score between D0-E0, and MSAT value of 2(motor activity), 3(arousal) (See Tab.1).

RESULTS. Mean drugs dosage was 0.078±0.026 mg/kg/min for R and 0.066±0.02 mg/kg/min for M. All patients showed an adequate level of analgo- sedation with NT index score between D0-E0 corresponding to MSAT values of 2-3, for 85% of observation time. We registered four cases of over and under sedation, pointed out by Narcotend in 5 min and MSAT after 15 min, and treated with correction of infusion dose. No significant variation of hemodynamic parameters were registered.

TABLE 1. Analgo-sedation level MSAT

| Analgo-sedation level | NT index | MSAT |
|-----------------------|----------|------|
| Deep                  | E1-E2    | 1/1-2|
| Adequate              | D0-E0    | 2/3-5|
| Superficial           | B0-C2    | 3-4-5-6|

CONCLUSION. Our preliminary data suggest that NT is able to monitorize sedation and analgesia in critically ill patients during administration of midazolam and remifentanil and this has a good correlation to the MSAT levels. It may be interesting to test NT in trauma or burned patients or during the execution of invasive diagnostic procedures in ICU. In all these conditions it is necessary to state in a few unities the real sedation level.

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0657
NIRE ASSESSMENT OF MICROCIRCULATION IN SEPTIC AND POLYTRAUMATIZED PATIENTS
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INTRODUCTION. There is evidence that the development of MOF, and ultimately death is closely
related to impaired microcirculation. As a preliminary study, we analyzed the S02 in three different
types of patients to assess the differences in the microcirculation pattern between septic, healthy
and hemorrhagic shock patients.
METHODS. We studied twelve patients (four polytraumatized (PLT), four shock septic (SEPTIC)
patients and four healthy volunteers (CONTROL)) and analyzed the microcirculation in the following
manner. Thenar muscle S02 was measured non invasively by NIRE (BiSpectra, Hutchinson Technol-
ogy, USA) before and during upper limb ischemia. The basal S02 and the rate of the S02 decrease
down slope) were analyzed.
RESULTS.
CONCLUSION. As the rate of S02 down slope has been related to the rate of O2 consumption, we
can hypothesize an altered O2 uptake which can result in a tissular hypoxia both in SEPTC and PLT
patients. Moreover basal S02 may suggest that the intrinsic mechanism of the altered O2 consump-
tion may be: microvascular shunting for sepsis (high basal S02) and intense vasoconstriction for PLT
patients (low basal S02). However further research is required to confirm these assumptions. S02
monitoring may be useful as an indicator of a diminished consumption as a marker of hypoxia during
septic or hemorrhagic shock.
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0659
VALIDATION OF NOVEL ULTRASOUND DILUTION CARDIAC OUTPUT METHOD FOR
PEDIATRIC AND NEONATAL PATIENTS
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INTRODUCTION. Small blood vessel size limits the ability to measure cardiac output (CO) in pe-
idiatric and neonatal patients. The problem was overcome by: a) using ultrasound velocity (UV) dilu-
tion technology to produce dilution curves by injecting isotonic saline (UV=1533 m/sec) into blood
(US=1570-90m/sec); b) using an extracorporeal AV tubing loop connected to extant arterial and ve-
nous catheters through a peristaltic pump. The purpose of the study was to validate dilution measure-
ments with direct readings in different size animals with “gold-standard” transit time technology.
METHODS. Six rats (230g-712g), three pigs (15-21 kg) and a sheep (65 kg) were instrumented on
the ascending aorta or pulmonary artery with transit-time perivascular flow probes (2.5mm, 12mm and
24mm, Transonic Systems Inc.). A disposable AV loop, filled with heparinized saline, was connected
between the arterial and venous catheters inserted in the animal. A peristaltic pump circulated blood
(4-12 ml/min) from the artery to the vein for 3-5 min to perform 2-3 measurements. Two UV sensors
were clamped onto the arterial and venous sides of the AV loop. Isotonic saline was injected into the
AV loop upstream from the venous sensor. CO was calculated from the dilution curve recorded by
arterial sensor and by a HCP101 Monitor (Transonic Systems Inc.).
RESULTS. In all size animals, ultrasound dilution and transit time readings closely agreed.

0660
CLINICAL EVALUATION OF URINE OUTPUT MONITORING SYSTEM IN CRITICALLY
ILL PATIENTS
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INTRODUCTION. Monitoring of urine output is crucial in critically ill patients, allowing the caregivers
to detect and prevent aberrations. This prospective comparative study evaluates the reliability of a new
system for automatic measurement of urine output, the Urexact 2000 System (SFM Ltd, Jerusalem, Is-
rael) based on a calculator linked to an optic reader that detects the amounts of urine each hour, up to 9
days.
METHODS. 20 unselected patients (10 males and 10 females, mean age of 65.6±15.6 y.), admitted
in our surgical ICU were enrolled. All patients had standard monitoring, including a Foley catheter,
connected to a standard manual urinometer. For 12 consecutive hours, the nurses checked the values
reported on the Urexact 2000 System comparing them with the conventional manual measurements
of urine output. Manual and electronic measurements were compared with the Bland and Altman and
with the R of Pearson tests.
RESULTS. The measured mean value of urine output did not significantly differ from the value man-
ually measured (111±91±93.95 versus 111±74±93.75, p<NS). The R of Pearson test showed a good corre-
lation between the two measurements (R=0.99) (see figure 1) with a good agreement, as shown by the
Bland and Altman test.
CONCLUSION. Our data show the reliability of the new system for automatic measurement of urine
output in critically ill patients. This system can reduce and optimize nurses workload in ICU.

0658
DEVELOPMENT OF ALARM SOUND SIMULATOR AND DATABASE
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INTRODUCTION. Although medical devices have generated alarm signals since the 1950's, a prolif-
eration of alarm signals, particularly of the auditory variety, is causing problems [1]. The purpose of
this study was to develop an interactive software system of alarm sounds to present, train, recognize
and share problems about alarm sounds.
METHODS. The system is composed of the alarm sound database, recorded alarm sounds and the
alarm sound simulator. The alarm conditions were arbitrarily induced by attaching physical models to
medical devices. The system that integrated an alarm sound database and simulator was used to assess
the ability to identify the monitor that sounded the alarm for the medical staff.
RESULTS. Sixty alarm sounds (40MB in total) were recorded from 41 medical devices made by
28 companies. The alarm sound database was created in an Excel file (ASDB.xls 170kB, 40MB with
photos). Nine columns stored information of each alarm sound, type of device, name of manufacturer,
machine model, alarm priority, alarm sound profile, fundamental frequency, A-weighted sound pres-
sure level, alarm condition and file name of alarm sound. The spreadsheet consisted of 91 lines. There
were a pair of similar alarm sounds that could not easily be distinguished and had a different priority.
The alarm sound profiles were classified by musical impression: a continuous simple sound without
a pause (Buzzzer, 14 cases), a simple sound with a pause (Beep, 22), a continuous harmonized sound
(Siren, 8), bursts composed of various pulses (Pulse, 35), a daming burst pattern (Chime, 12). An alarm
sound simulator (AlmSim) (260KB, VC++) was constructed with two modules for simultaneously
playing alarm sound files and for designing new alarm sounds. The AlmSim was used in the assess-
ing procedure to determine whether 19 clinical engineer can identify 14 alarm sounds only by their
distinctive sounds. The overall correct identification rate of the alarm sounds was 46%.
CONCLUSION. We have developed an interactive software package of alarm sounds. The AlmSim
was useful for replaying alarm sounds simultaneously and designing new alarm sounds interactively.
Medical personnel and manufacturers should recognize the confusing situations and share the informa-
tion of alarm sounds to improve with cacophony of the current noisy environment.
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0661
VALIDATION OF ELECTRICAL IMPEDANCE TOMOGRAPHY DURING ONE-LUNG VENTILATION
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INTRODUCTION. Many experimental and clinical studies have clearly demonstrated that alveolar and airway damage may be induced by mechanical ventilation, especially when inadequate ventilator settings with high pressures and tidal volumes are used. Ventilator therapy could be optimized if online monitoring of regional lung function were available at the bedside. Electrical impedance tomography (EIT) has been proposed as a possible new radiation-free imaging technique to continuously assess regional lung function in ventilated patients (1). The aim of our study was to evaluate the performance of EIT in patients during volume controlled mechanical ventilation. We have studied a specific group of patients in whom mechanical ventilation of one lung was indicated for surgical procedures giving us the opportunity of analyzing the EIT data acquired during both bilateral and unilateral lung ventilation.

METHODS. Ten adult patients undergoing elective thoracic surgery with single lung ventilation were included. EIT measure-ments were performed with the Goer MF-II EIT system (Viasys Healthcare). Sixteen electrodes were applied on the chest circumference in one transverse plane and used for rotating electrical current injection and voltage measurement. The EIT data were acquired at a rate of 13 scans/s during a 60 s time interval. The data were collected during ventilation of both, right and left lungs. Tidal volumes of 800 ml were applied during bilateral and 400 ml during unilateral ventilation.

RESULTS. The ventilation-related impedance changes determined in the whole chest cross-section during both the right and left lung ventilation did not significantly differ from each other and were equal to 47.6 ± 5.6% and 48.5 ± 7.8% (mean ± SD) of the value determined during bilateral ventilation. During one-lung ventilation EIT clearly separated the ventilated and non-ventilated lung with 92.2 ± 3.9% and 90.2 ± 4.1% of ventilation related impedance changes occurring over the ventilated hemithorax during the right and left lung ventilation, respectively.

CONCLUSION. EIT is a sensitive method for monitoring the topographical distribution of ventilation. Changes in global tidal volumes are adequately detected by EIT both during bilateral and unilateral lung ventilation. Good separation of the ventilated and unventilated side of the chest is possible during one-lung ventilation.

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0662
A COMPARISON OF THE CARDIAC OUTPUT MEASURED BY PICCOTM AND PULSECO2TM
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INTRODUCTION. We compared the accuracy and precision of cardiac output assessed by two different pulse contour analysis monitors; PICCOTM (PULSION Medical Systems) and PulseCO2TM (LIDCO Ltd) in patients undergoing off-pump coronary artery bypass grafting.

METHODS. Fifteen patients for off-pump coronary artery bypass grafting were anaesthetized with midazolam, fentanyl and vecuronium. Cardiac output was simultaneously measured by the PICCOTM, PulseCO2TM and bolus thermodilution method: (1) after induction (control), (2) after sternotomy, (3) after opening the mediastinum and (4) at the end of surgery. PulseCO2TM was initially calibrated with a value of cardiac output by bolus thermodilution method. PulseCO2TM measurement was performed by indocyanine green dye injection (induction, sternotomy, and opening the mediastinum).

RESULTS. Cardiac output by PulseCO2TM was significantly higher, however, cardiac output by PICCOTM was significantly lower than cardiac output by bolus thermodilution method (Table). The mean differences of cardiac output measured by between PICCOTM and bolus thermodilution were: (1) -0.31, (2) -0.37, (3) -0.45, (4) -0.62 l/min and those between PulseCO2TM and bolus thermodilution method were: (1) 0, (2) 0.41, (3) 0.25, (4) 0.47 l/min.

CONCLUSION. PICCOTM might underestimate and PulseCO2TM might overestimate cardiac output, when compared to cardiac output measured by bolus thermodilution method in patients undergoing off-pump coronary artery bypass grafting.

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Poster Sessions
Tracheostomy in the ICU 0663-0669

0663
DOES PERCUTANEOUS TRACHEOSTOMY HARM THE CRITICALLY ILL?
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INTRODUCTION. Aims: to determine whether 1) tracheostomy affects hospital outcome; 2) timing of tracheostomy affects duration of mechanical ventilation and hospital outcome.

METHODS. Retrospective cohort study [N=703] on patients requiring intubation and mechanical ventilation for > 48hrs.

RESULTS. Tracheostomy was performed in 46% [322/703] of patients. There was no difference in hospital outcome between the ‘early’ [<=7days; n=168] and ‘late’ [=>8Days; n=154] tracheostomy groups (p=0.36). Survivors in the early group had a significantly shorter duration of mechanical ventilation compared to the survivors in the late group (9 days Vs 15.3 days; p=0.001).

| TABLE 1. | Tracheostomy | No Tracheostomy | Risk & Odds Ratio (RR & OR) |
|----------|--------------|-----------------|---------------------------|
| Survivor | 190/226 | 132/155 | RR= 0.99; OR=0.98 |
| Non Survivor | 72/89 | 54/69 | RR= 1.02; OR=1.0 |

| TABLE 2. | Tracheostomy | No Tracheostomy | Risk & Odds Ratio (RR & OR) |
|----------|--------------|-----------------|---------------------------|
| Tracheostomy >8Days* | 97/178 | 71/118 | RR= 0.96; OR=0.9 |
| No Tracheostomy >8Days** | 38/48 | 61/37 | RR=1.07; OR=1.1 |

CONCLUSION. There is a benefit in the reduction of mechanical ventilation in the early tracheostomised group. Therefore, tracheostomy and the timing of tracheostomy must be individualised to obtain maximum risk benefit ratio.

0664
FOLLOW-UP OF PATIENTS WITH TRACHEAL RING FRACTURES SECONDARY TO PERCUTANEOUS DILATIONAL TRACHEOSTOMY
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INTRODUCTION. Tracheal ring fracture (TF) is a recognised complication of percutaneous dilatational tracheostomy (PDT). The aim of this study was to assess whether TF resulted in an increased incidence of tracheal stenosis.

METHODS. Over a 26 month period 207 PDT’s were performed using either the blue Rhino or percutwist techniques. Fibreoptic guidance was used in all cases and allowed identification of TF’s. Patients who sustained a fracture were reviewed at 6 months by a consultant ENT surgeon using laryngotraceoscopic assessment.

RESULTS. The results are shown in table 1. Sixteen patients with TF were identified, at six months follow up. Five patients had died and in the remaining 11 there was no clinical or endoscopic evidence of tracheal stenosis. Laryngotraceoscopy revealed an anterior mucosal ridge in one patient, but there was no significant stenosis.

| TABLE 1. | Number | Mean Age | TRF | Sub-glotticstenosis |
|----------|--------|----------|-----|---------------------|
| Blue Rhino | 75 | 66.2 | 4 | 0 |
| Percutwist | 132 | 67.1 | 12 | 0 |
| Total | 207 | 126.81 | 16 | 0 |

CONCLUSION. This is the only follow-up study designed to specifically assess whether TF during PDT is associated with an increased risk of tracheal stenosis. Previous studies have identified TF as a common complication of the percutwist technique1, as well as tracheal stenosis following poor placement of the tracheostomy2. It is therefore suprising that there was no evidence of tracheal stenosis in our study, which may be explained by the low placement of the tracheostomies in our series (below the first tracheal ring).

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0665  PUNCTUATELY INSERTION OF FENESTRATED TRACHEOSTOMY TUBES AND POSITION OF THE FENESTRATION
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INTRODUCTION. Percutaneous Tracheostomies (PT) are regularly performed in our unit, under endoscopic control, using a Cook Blue Rhino percutaneous tracheostomy kit. For practical reason the tracheal tube most often used is a Fenestrated Tracte Tube (FTT). Our aim was to assess the position of the fenestration of tracheostomy tubes (TT) just after percutaneous insertion.

METHODS. For a period of 4 months, after all successful PT performed in our unit, we visualized the trachea proximal to the TT using a bronchoscope inserted through the oral endotracheal tube. When the fenestration was seen in the trachea we counted the number of fenestration holes visible (maximum of 7 for a FTTT). A picture of the posterior part of the TT was taken. We also recorded evidence of tracheal deformation, trauma and immediate complications.

RESULTS. 21 PT were performed, all with a Cook Blue Rhino percutaneous tracheostomy kit. In 20 cases a FTTT was used and in 1 case a Smiths Adjustable Flange tube was used. A size 8 tube was used in all 8 female patients and a size 9 tube was used for all 13 male patients. In 11 out of 20 cases (55%) the fenestration was not seen in the trachea and for another 6 patients only one hole was seen in the trachea. Only in one patient (5%) were all 7 holes of the fenestration within the tracheal lumen visible. The TT cuff was visible in all cases. The posterior part of the TT was visible in 18 of 21 cases (86%). In 3 cases only the cuff was seen within the trachea. In 5 cases, a severe deformation of the trachea was seen, with a significantly decreased anterior-posterior diameter. In 2 cases, the position of the FTTT was considered to be inappropriate and was changed for a Smiths Adjustable Flange Tracheostomy Tube. In 2 cases, air bubbles could be seen emerging from the fenestration holes, despite the presence of a non-fenestrated inner cannula. One patient sustained a fractured tracheal cartilage and another patient’s procedure was complicated by surgical emphysema.

TABLE 1.
Number of fenestration holes in the trachea:

| No patients (%) | 0 | 1 | 2 | 3 | 4 | 5 or 6 | 7 |
|-----------------|---|---|---|---|---|-------|---|
| n patients (%)  | 11 (55) | 6 (30) | 1 (5) | 0 | 1 (5) | 0 | 1 (5) |

CONCLUSION. We suggest that when a fenestrated TT is used, its position should be visualized using a bronchoscope. This may lead to a clinical decision to change the type of TT used. Further studies are required to assess the impact of the position of the fenestration of the TT on the weaning of the patient and whether the position of the fenestration alters with time.

0666  TRACHEOSTOMY MANAGEMENT: A RETROSPECTIVE STUDY FROM A INTERMEDIATE UNIT
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INTRODUCTION. Patients with tracheostomy have a high morbidity and mortality. The management of tracheostomy tube is a complex process that required careful coordination and consistent follow-up.

METHODS. The authors made a retrospective study of patients with tracheostomy, admitted in the years 2004 to 2005 in a Intermediate Unit (U.M.D of Garcia de Orta Hospital in Almada, Portugal).

RESULTS. 36 patients constitute our group, with 36.1% females and 63.8% older than 61 years. 86.1% of patients were transferred from a Intensive Care Unit with a SAPS II at admission in the UMD greater than 50 in 55.5% of patients. All patients were ventilated with positive pressure previously to tracheostomy, with more than 50% of our group ventilated less than 5 weeks. The main reason of mechanical ventilation was pneumonia with or without sepsis. The pathogens related to our patients were mainly related to cardiovascular or to chronic pulmonary diseases. The main indication for tracheostomy in our patients were the need of secretion removal and a long term positive pressure ventilation. The type of tubes used were Shiley cuffed in 35 patients. The tube of tracheostomy was change until 4 - 5 weeks in 25 patients, removed in 1 and never occurred in 5 patients who died previously. All the tubes were changed in the UMD, 92% of them on the firsts 2 weeks of admission in this unit. The removal of the tracheostomy occurred until 2 weeks of the change in 93.3% of the patients, but as soon as possible. In all this process the physiotherapy had a fundamental work. 27.2% of the patients of our group (10) died in the hospital.

CONCLUSION. The tracheostomy is not a disease by it self, but the result of a serious of diseases with a high morbidity. This is reflected in the SAPS II at admission and by the mortality of this patients. In all this process the physiotherapy had a fundamental work.

0667  PROGNOSIS OF MECHANICALLY VENTILATED PATIENTS SUBMITTED TO TRACHEOSTOMY
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INTRODUCTION. Although tracheostomy is a common procedure in patients under prolonged mechanical ventilation, its indication and timing remain controversial. It has been suggested that the procedure reduces the duration of mechanical ventilation and intensive care unit length of stay (LOS). Nevertheless, no well designed prospective clinical study has proved this hypothesis to date. We propose to analyze the impact of tracheostomy in the prognosis of patients under mechanical ventilation.

METHODS. We followed a concurrent cohort of 88 patients in invasive ventilation for more than 48 hours, between 18 and 95 years old. Patients tracheostomized before admission in the intensive care unit (ICU), with Coma Glasgow Scale chronically less than 8, advanced stage neoplasms or neuromuscular disease were excluded. We compared the tracheostomy group (n=38) with the control (endotracheal tube) group (n=50). The primary endpoints were ventilation duration and ICU LOS. The secondary endpoints were mortality and incidence of ventilation associated pneumonia (VAP). Categorical variables were compared by the chi square test and the continuous variables were compared by the T Student test. Potential biases were controlled by multiple linear regression.

RESULTS. The incidence of tracheostomy was 43% (IC=33-54%). In the control and tracheostomy groups, the measured variables were respectively as follows: mean age 75 years (SD=10) versus 72 years (SD=20, p=0.37); mean APACHE II 16 (SD=4) versus 17 (SD=6, p=0.52); the mean initial SOFA 6 (SD=3) versus 5 (SD=3, p=0.20); mean ventilation duration 8 days (SD=5) versus 23 days (SD=11, p=6.40x10^{-5}); the mean ICU LOS 14 (SD=11) versus 29 (SD=12, p=8.20x10^{-7}); the incidence of VAP 17.5% and 20.67 cases/1000 ventilation days (p=0.002) and mortality 54% (IC=40-68%) versus 26% (IC=12-46%) (p=0.01). In the multiple regression models, including as independent variables age, APACHE II, initial SOFA, VAP and tracheostomy, only the last two had statistically significant impact in ventilation duration (p=0.02 and 1.20x10^{-5}, respectively) and mortality (p=0.001 and 0.0002, respectively).

CONCLUSION. In our study, tracheostomy was associated with statistically significantly longer duration of mechanical ventilation and ICU length of stay, as well as it is related to statistically significant decrease in mortality. There was also a statistically significant increase in the incidence of VAP in the tracheostomy patients.

Grant acknowledgement. REDE ESHO

0668  TRACHEOSTOMY TUBES SHOULD BE MADE LONGER
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INTRODUCTION. Standard length tracheostomy tubes are inserted during most percutaneous dilational tracheostomy (PDT) procedures. Length of the stem of standard tracheostomy tubes has been designed within the perceived limits of anatomic proportions. Tracheostomy tubes that are too short may exert excessive pressure on tracheal wall around the stoma and carry potential risk of accidental decannulation. There is little data on optimal length of the stem of tracheostomy tubes i.e. the distance from skin to the tracheal walls and angle of tracheal stoma. We performed such measurements to determine what should be the optimum length and angle of tracheostomy tubes.

METHODS. A total of 50 patients requiring tracheostomy were enrolled following informed assent. The procedure of percutaneous tracheostomy was performed as normal using a Blue Rhino dilator guided by fibroptic bronchoscope/monitor. Following the dilation of tracheal stoma a depth gauge was inserted into the trachea to measure the distance from skin to anterior and posterior tracheal walls. The angle of the stoma was then estimated using several performed angled steel rods choosing the one which aligned best to anterior tracheal wall. After the measurements a tracheostomy tube was inserted. The distance from the carina to tip of tracheostomy tube was then measured with bronroscope.

RESULTS. Data of two patients were excluded from analysis as the all the measurements were not possible in them. Patients were 22-88 years of age with a median of 58 yrs. Their weight and heights were 78.5 ±15.5 kg and 167.6 ± 7.8 cms respectively. No trial extubation was considered in 29 patients (61%), one trial in 11 (23%), two trials in 7 (14%) and three trials in 1 patient. Patients were intubated for duration of 7 ± 2 days before performing tracheostomy. Tracheostomy was performed below 2nd tracheal ring in 32 patients (66%), below 1st ring in 14 (30%) and below third ring in 2 patients. The distances measured from skin to anterior and posterior tracheal wall were 25.6±7.0mm and 46±8.2mm respectively. Average estimated angle of stoma was 133±90 degree and the measured distance between the carina and the tip of the tracheostomy tube was 41.8±8.4 mm. These measurement were then compared with both the stem and effective intratracheal segment of 13 commercially available tracheostomy tubes.

CONCLUSION. The measurements in this study suggest that conventional tracheostomy tubes are shorter for the population of critically ill patients and should be made at least 2 cms longer leaving an average distance greater than 2 cms to the Carina.
INTRODUCTION. The use of heparin has been advocated to promote more rapid liberation from mechanical ventilation (MV). The purpose of this study was to evaluate the influence of the therapeutic role of heparin in the outcomes of patients on MV.

METHODS. Prospective cohort study, including all consecutive patients admitted from April 2005 to April 2006 in a medical-surgical adult ICU.

RESULTS. Three hundred four of the 877 admitted on ICU required MV, and 202 (22.8%) were on MV for more than 48h. Forty-two (21%) of these 202 patients received tracheostomy. Comparing the tracheostomized patients with the 596 non-tracheostomized ones there were no differences in age, body mass index, Apache II score, SOFA index on admission, Glasgow Coma Scale and TISS 72.

Outcomes were not different between groups in respect to hospital mortality (26.2% vs 39.2%, p=0.14) and nosocomial infection in ICU (19.6% vs 13.3%, p=0.33). However, tracheostomized patients had a longer total time on MV (27.07±21.5 vs 7.54±6.0 days, p=0.001), higher ICU stay (39±1.23 vs 10.8±1.45 days, p=0.001) and higher post-ICU stay in hospital (39±8±1.40 vs 18.8±14.9± p=0.02).

In the patients submitted to tracheostomy, 8 (9.04%) had the procedure done in less than 10 days (6.0±3.3 days) and 29 (39.04%) in more than 10 days (18.7±6.17 days, p=0.06). In these cases the ICU stay and the hospital stay was both significantly shorter in the early tracheostomy group compared to the late (p=0.08 and p=0.07 respectively).

CONCLUSION. In our cohort, patients submitted to tracheostomy spent more time in ICU and on mechanical ventilation, besides no differences in severity of illness compared to patients that not need it. Early tracheostomy promoted a more rapid liberation from mechanical ventilation, however there were no differences in ICU stay.

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**P<0.01 ***P<0.001

CONCLUSION. The administration of heparine in Severe Sepsis is beneficial for the patients as regards recovery, improvement of MODS, and reduction of all cause mortality.

TABLE 1.

| MODS | Recovery | All Cause Mortality |
|------|----------|---------------------|
| With heparine | Without heparine | With heparine |
| 1 (0.07%)** | 4 (33%) | 1 (0.07%)** |
| 12 (85%)*** | 3 (25%) | 2 (17%)*** |
| 3 (21.5%)*** | | 9 (75%) |

**P<0.01 ***P<0.001

CONCLUSION. Administration of heparine in Severe Sepsis is beneficial for the patients as regards recovery, improvement of MODS, and reduction of all cause mortality.

INTRODUCTION. Acute dysfunction of 2 or more organ systems induced by the episode of sepsis and the SIRS criteria. We excluded the patients with 1) active internal bleeding, 2) major surgery within the last 12 hours, 3) plferate count<5000/mm³, 4) recent (within 3 months) hemorrhagic stroke, 5) history of intracerebral arteriovenous malformation, cerebral aneurysm or central nervous system mass lesion. Patients were randomly assigned to be treated either by adding heparine to standard therapy at a dose of 15 IU /Kg/h for ten days (group A, 14 patients) or not (group B, 12 patients). We estimated the process of sepsis by Sepsis Severity Score (SSS) every day, the process of the MODS by APACHE II score and finally we recorded the all cause mortality. Statistical analysis was made by x² test.

RESULTS. 1) As regards the MODS, the improvement of patients at group A was significantly higher than group B, (p<0.01). 2) Recovery from sepsis was greater at group A than group B, (p<0.01). 3) All cause mortality was lower at group A than that of group B, (p<0.001).

**P<0.01 ***P<0.001

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INTRODUCTION. Systemic inflammatory mediators activate the coagulation system; conversely systemic inflammation is induced by coagulation. Thus, it may be possible to attenuate the generalised host inflammatory response to septic stimuli through careful regulation of the coagulation system. The aim of this study was to investigate this hypothesis.

METHODS. 26 consecutive ICU patients were included in the trial (14 male and 12 female mean age 40±20 years old). Apache II score on admission was ±10. The study protocol was approved by the local ethics committee. Patients fulfilled the following inclusion criteria: 1) Presence of a known or suspected infection, 2) Acute dysfunction of 2 or more organ systems induced by the episode of sepsis and 3) the SIRS criteria. We excluded the patients with 1) active internal bleeding, 2) major surgery within the last 12 hours, 3) plferate count<5000/mm³, 4) recent (within 3 months) hemorrhagic stroke, 5) history of intracerebral arteriovenous malformation, cerebral aneurysm or central nervous system mass lesion. Patients were randomly assigned to be treated either by adding heparine to standard therapy at a dose of 15 IU /Kg/h for ten days (group A, 14 patients) or not (group B, 12 patients). We estimated the process of sepsis by Sepsis Severity Score (SSS) every day, the process of the MODS by APACHE II score and finally we recorded the all cause mortality. Statistical analysis was made by x² test.

RESULTS. 1) As regards the MODS, the improvement of patients at group A was significantly higher than group B, (p<0.01). 2) Recovery from sepsis was greater at group A than group B, (p<0.01). 3) All cause mortality was lower at group A than that of group B, (p<0.001).

**P<0.01 ***P<0.001

CONCLUSION. The administration of heparine in Severe Sepsis is beneficial for the patients as regards recovery, improvement of MODS, and reduction of all cause mortality.

INTRODUCTION. AIM: illustrate the use of prot.C (PC) concentrate in adult pts with severe sepsis and septic shock and contraindications to activated PC. We carried out an observational and dose-finding study with 28-day follow-up and a analysis of the hemato-chemical and clinical parameters. Attention was paid to the PC plasma levels, to the coagulation system, to the SOFA score as well as to the safety under bleeding risk conditions.

METHODS. We included 20 pts (10f/10m) with severe sepsis (5) or septic shock (15) with PC plasma levels less than 50% of the patients’ expected infection, 2) Acute dysfunction of 2 or more organ systems induced by the episode of sepsis and the SIRS criteria. We excluded the patients with 1) active internal bleeding, 2) major surgery within the last 12 hours, 3) plferate count<5000/mm³, 4) recent (within 3 months) hemorrhagic stroke, 5) history of intracerebral arteriovenous malformation, cerebral aneurysm or central nervous system mass lesion. Patients were randomly assigned to be treated either by adding heparine to standard therapy at a dose of 15 IU /Kg/h for ten days (group A, 14 patients) or not (group B, 12 patients). We estimated the process of sepsis by Sepsis Severity Score (SSS) every day, the process of the MODS by APACHE II score and finally we recorded the all cause mortality. Statistical analysis was made by x² test.

RESULTS. 1) As regards the MODS, the improvement of patients at group A was significantly higher than group B, (p<0.01). 2) Recovery from sepsis was greater at group A than group B, (p<0.01). 3) All cause mortality was lower at group A than that of group B, (p<0.001).
INTRODUCTION. We have evaluated the efficacy of substitutive treatment with coagulation inhibitors in restoring the coagulative status of septic patients. Secondary endpoint was to state whether the correlation among SOFA score and laboratory data is statistically significant.

METHODS. We enrolled 13 patients admitted in ICU with surgical severe sepsis associated to severe deficit of coagulation natural inhibitors. Within 48 hours from the admission, the patients were treated with rhAPC (24mcg/kg/h) for 96 hours associated to the correction of AT III levels (>120%) for 14 days. We monitored coagulation status by the thromboelastography (TEG) (at the beginning, every 12 hours during the treatment, 24 hours and 48 hours after the end) and by AT III, and Protein C levels, PT, APPT, fibrinogen, d-dimer, TAT and platelets. We also have registered SAPS II and SOFA score until the discharge, the correlation among these scores and coagulation screening and global tests (TEG).

RESULTS. 9 patients survived and 4 died during the treatment. The groups were homogeneous for SAPS II, SOFA, sex and age at admission. After treatment there was a statistically significant difference (p<0.05) between two groups for SOFA score (5.1±1.8 vs 11.1±7.1, TEG parameters (MA (44±11) vs 71±7), and AP III levels (136±11 vs 112±13) with better results in the survivors group. Therefore, statistical analysis (Spearman’s rank test with n=33, p<0.01) confirmed the correlation among SOFA score and laboratory data, specially TEG’s parameters, in survivors and non-survivors group.

CONCLUSION. Both groups of patients (survivors and non-survivors) have showed a direct correlation between organ dysfunction and imbalance of haemostasis. Survivors have registered an early and significant improvement of haemostasis confirmed by thromboelastography data. Non-survivors have showed the persistence of surgical infection and a significant DIC status. Nobody registered bleeding therapy linked events and this was pointed out by TEG. These preliminary data confirm the significant role of both main coagulation inhibitors in sepsis and might open the door to use “combination therapy” in severe sepsis associated to coagulopathy.

TABLE 1. ...

CONCLUSION. The early onset of activated drotrecogin alfa infusion reduce the length of MV, the requirements of vasopressors and the number of organic dysfunctions at 96 hours. We did not found difference in the bleeding. The early onset of the administration of drotrecogin alfa is associated to an important reduction in mortality in elderly patients.

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0677
PATIENT OUTCOME AND CHANGES IN ORGAN FAILURE SCORES IN PATIENTS RECEIVING ACTIVATED PROTEIN C
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INTRODUCTION. Mortality in severe sepsis is variously described, but is often up to 50% (1). Activated Protein C (APC), a mediator of the inflammatory and coagulation systems shows a decrease of hospital mortality from 34.5% to 29.7% (2). We assessed mortality outcomes and evolution of organ failure scores in patients who received APC.

METHODS. Data was collected from patients who, from 2002-2006, received APC, using the ICU database base and retrospective analysis of patient records. Expected mortality was calculated using a Mortality Prediction Model of APACHE II scores (24 hrs post ICU admission). Sequential Organ Failure Assessment Scores (SOFA) were used to assess organ dysfunction for 24 hrs prior to receiving APC, every 24 hrs during the infusion and 24 hrs post cessation.

RESULTS. APC was administered to 35 patients. 7 were excluded (4 into a phase 3 trial and 3 due to difficulty obtaining medical notes). Total of 16 females and 12 males with a mean age 52 and a mean APACHE II of 23 were assessed. APC was administered for 96 hrs except for 8 patients who died or whose infusion was prematurely terminated due to complications or resolution of illness. 17 survived to hospital discharge with 11 deaths (39%) compared to predicted mortality of 48%, giving a SMR of 0.79.

CONCLUSION. This study was limited in size; statistical analysis may be misleading. Nonetheless, APC reduces mortality compared to predicted rates. Organ dysfunction (SOFA scores) improved throughout infusion period, even in the reducing numbers of non-survivors. This latter observation may reflect ultimate death from other future events.

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0678
PREDICTIVE FACTORS IN CRITICALLY ILL PATIENTS TREATED WITH DROTRECOGIN ALFA (ACTIVATED)
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INTRODUCTION. Drotrecogin alfa activated (DAA) is an approved treatment for patients with severe sepsis and a high risk of mortality and limited risk of bleeding. We sought to identify some simple clinical and/or biochemical factors that may help predict a favorable outcome in patients treated with DAA. Such predictive factors could help to shorten the duration of this costly treatment in patients who improve rapidly.

METHODS. We treated a total of 126 patients with DAA, including 30 in the context of clinical trials. Data were collected at baseline (start of DAA infusion) and for 30 days. Patients were separated into two groups: group 1 (N = 44) included all patients alive and without any major organ need for support (vasopressor agent, respiratory support or extracorporeal renal support) at day 5; group 2 (N = 82) included all other patients. C-reactive protein (CRP) concentrations were measured daily.

RESULTS. A total of 37/41 patients (90%) patients in group 1, but only 40/72 (56%) patients from group 2, experienced a maximum increase of 5 mg/dl in CRP concentrations (p = 0.005) in the first 24 hours of treatment with DAA. Of these patients, 25/36 (69%) from Group 1 and but only 16/42 (38%) from Group 2, had a decrease in SOFA score during the first 24 hours (p=0.006).

CONCLUSION. A simple algorithm based on combined changes in CRP levels and SOFA score during the first 24 hours of treatment with DAA can help identify patients with a favorable outcome, in whom a shorter therapy with DAA may be considered.

0679
DROTRECOGIN ALFA (ACTIVATED) (DAA) IN PATIENTS WITH SEPSIS-INDUCED OVERT-DIC
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INTRODUCTION. DAA is indicated for the treatment of patients (pts) with severe sepsis (SS) at high risk of death but is associated with an increased risk of bleeding. Pts with SS-induced overt-DIC have a described 28-day all-cause mortality ranging from 43 to 45%. We assessed mortality from DAA but considered at higher risk of bleeding. We looked at DAA efficacy and safety in pts with SS-induced overt-DIC treated with DAA.

METHODS. Retrospective analysis of all pts with SS and platelets counts <150,000/mm3 and treated with DAA. Baseline characteristics including severity scores, DIC-score, source of infection, blood culture, outcome and safety were analyzed. FFP was given if INR <3 and Platelets concentrate if <30,000/mm3, during DAA treatment.

RESULTS. 65 pts were included in the study. Age: 61.5±13, APACHE II 29.5±6.8, SOFA 11.9±6.8 yr, mean ± standard error, and T Student test was performed. All pts had SS-induced overt-DIC. Mortality in group 1 (N=21): 25.2±5.1, DIC score 10±2.4, 14±3.4%, and 30,000/mm3 were observed in 81, 61 and 30% of pts respectively, at baseline or during DAA infusion. Table 1 provides baseline severity scores and outcome in the studied population. Overt-DIC was present in 67.6% and mortality was 36.5% compared to 43 to 45% in the published literature despite higher severity scores. Bleeding events were present at baseline in 78.5 (10.7%) and developed in 78.5 (10.7%) during infusion. DAA infusion was interrupted in 2 pts (3%) because of bleeding and no pts developed CNS bleed. No pts died because of bleeding.

CONCLUSION. DAA seems to improve outcome in SS-induced overt-DIC compared to the published literature. DAA has an acceptable safety profile. DAA administration, when combined to FFP and Platelets concentrates to maintain INR <3 or Platelets counts >30,000/mm3, was not associated with serious bleeding events or CNS bleeds.

0680
INFLAMMATORY IMPACT OF THE USE OF ACTIVATED RECOMBINANT FACTOR VIIa FOR MASSIVE HEMORRHAGE CONTROL IN SEPSIS
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INTRODUCTION. Initially, activated recombinant factor VIIa (rFVIIa) was used in patients with congenital or acquired hemophilia. In recent years, the potential of rFVIIa to act as a prohemostatic agent in patients with a preexistent normal coagulation system has been exploited. The aim of this study was to analyse the inflammatory impact of the use of rFVIIa for massive haemorrhage control in sep- sis. OBJECTIVE: Evaluate in a case series the impact of the use of rFVIIa upon the indirect indicators of acute inflammatory response and upon plasma coagulation markers.

METHODS. Retrospective study carried out in a tertiary care hospital in a series of patients who received rFVIIa.54 patients with sepsis diagnosis associated to massive hemorrhage (hemodynamic instability and hemotransfused with more than 3 units of packed red blood cells) were included during the period from march 2003 to march 2005. Blood samples were collected 24 h before, immediately before and 24 hours after rFVIIa administration or SOFA score analysis. Complete blood count, C-reactive protein, procalcitonin, and coagulation tests: PAI-1, TAT, PT/INR, D-dimer, fibrinogen, platelet count, ATT III, C protein, and aPTT. Data are displayed as mean±standard error, and Student test was performed.

RESULTS. The population was constituted by 54 patients (64% males), mean age 74±14 yr, mean APACHE scores 20.9±4.5, lethality rate 38.6%. The comparison between the acute inflammatory response parameters before and after rFVIIa administration has not shown statistically significant differences, except for an increase in the neutrophil Young forms percentual after rFVIIa administration (5.0±1.9 x 10.3±5.2; p=0.025). No significant alteration of SOFA scores were noticed. From the coagulation markers evaluated, there was a significant alteration of the circulating blood levels of D dimer (2916+/-395.18 x 4060.66 +/- 574.45) (p=0.001).

CONCLUSION. In this case series analysis, rFVIIa use was associated to D Dimer plasma levels elevation, what is consistent with increase in the procoagulant activity. There wasn’t any significant in- crease in the inflammation response laboratory markers. In this group of patients, rFVIIa behaved as an effective therapy to control massive bleeding without signs of further inflammation response increase.

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0681
MUSCLE TISSUE OXYGENATION IN SEPTIC PATIENTS TREATED WITH ACTIVATED PROTEIN C

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INTRODUCTION. In septic patients, muscle tissue deoxygenation rate during stagnant ischemia is well correlated with organ failure extent and clinical outcome. Aim of this study was to evaluate the effects of recombinant human activated Protein C (rAPC) on muscle tissue perfusion and oxygenation during arterial clamping in patients with septic shock (1).

METHODS. Prospective pilot study in a nine-bed polyvalent surgical intensive care unit of a University hospital. In 9 consecutive septic shocked patients receiving rAPC, tranus muscle O2 saturation (StO2) % was measured by near-infrared spectroscopy (InSpira700, Hutchinson Technology Inc., USA) before, during and after a pneumatic cuff inflation at 240 mmHg. The cuff was placed above the elbow and it was deflated at an StO2 value of 40%. The rate of StO2 decreasing during ischemia as well as the time to restore baseline StO2 (re-saturation time) were calculated. Sepsis organ failure assessment score (SOFA) and the main respiratory and cardiovascular parameters were also measured. Data were collected before, during (24 hours) and 24 hours after rAPC infusion.

RESULTS. In all the patients, 96 hours of rAPC therapy were completed. The infusion was temporar- iedly stopped to allow invasive procedures in 4 patients and for minor bleeding in 1 patient. Baseline StO2 values observed before rAPC (79.9±8.8 1±) were very similar to those observed during rAPC infusion (79.9±11.3) and lower (p<0.05) than those observed 24 hours after the end of rAPC (77.9±29.7 1±). The rate of StO2 decreasing during ischemia increased by about 36% during rAPC infusion; there- after, it returned to baseline. The re-saturation time was longer before rAPC infusion (59.5±50.7 s) than during (43.9±27.8 s; p<0.05) and after (40.7±39.6 s; p<0.05) rAPC therapy. The SOFA score, the respiratory and the hemodynamic parameters improved during rAPC therapy in all the patients. The patient survival rate at 28 days after septic shock diagnosis was 66%.

CONCLUSION. The above preliminary data indicate that rAPC infusion improves muscle tissue oxygenation and perfusion in septic shock patients. These variations are associated with a contempo- rary improvement in SOFA score.

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0683
LINEZOLID COMPARED WITH VANCOMYCIN IN CRITICALLY ILL PATIENTS INFECTED BY GRAM-POSITIVE BACTERIA

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INTRODUCTION. Gram-positive bacteria (GBP) can cause serious infections in critically ill patients and vancomycin is a recent antibiotic proposed for these infections. The aim of this study was to compare clinical success and adverse events of linezolid compared with vancomycin in critically ill patients infected by GBP.

METHODS. We conducted an open and non-controlled study. The eligible patients with proven or suspected infection due to GBP were treated with vancomycin (VAN) or linezolid (LNZ) according to the physician criteria of intensive care unit (ICU). We registered the demographic data, the character- istics of infection, the adverse events and the outcome. We compared the data by Chi-square test or Fisher test for qualitative variables and t-Student for quantitative variables. The statistical significance was considered at P<0.05.

RESULTS. We included 30 patients, 16 were treated with LNZ and 14 with VAN. Age: 62.8 (12.5) years; SAPS III: 44.6 (15.1) and ICU stay 35 (19) days. The infected focus was: respiratory tract: 36.7%; abdominal: 33.3%; cathereter: 16.7%; others: 13.3%. GBP were distributed as following: Methicillin- resistant Staphylococcus aureus: 16 (9 LNZ and 7 VAN); Coagulase-negative Staphylococcus: 9 (4 LNZ and 5 VAN); Enterococcus faecium: 4 (1 LNZ, 2 VAN) and Streptococcus sp.: 1 (LNZ). The patients completed 11.1 (5.1) days of treatment in LNZ group and 12.1 (6.2) days in VAN group. Clinical success rates were equivalent between groups LNZ, 10 [62.5%] of 16 patients and VAN, 10 [71.4%] of 14 patients, P=0.49. Mortality in ICU were 6 patients in LNZ (37.5%) and 1 (7.1%) in VAN group; P=0.09. Mortality in hospital were 7 patients in LNZ (43.8%) and 4 (28.6%) in VAN group; P=0.38. Adverse events, specially hematologic events and impaired renal function was similar in both groups. A culture control of the infection focus was made at the seven day of treatment. 6 pa- tients (37.5%) had positive culture in LNZ group, versus 12 patients (85.7%) in VAN group, OR=10.0 (95% CI 1.64-60.95), p=0.01.

CONCLUSION. In this study, no statistical significant differences were found between LNZ and VAN when clinical success and adverse events were analyzed. Vancomycin treated patients were associated with a higher percentage of positive culture at seven day of treatment.

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Poster Sessions
Sepsis and bacteremia 0682-0695

0682
DO NOT TREAT ASYMPTOMATIC BACTERIURIA

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INTRODUCTION. To determine the effect of a treatment with a short-course of antibiotics and in-dwelling urethral catheter replacement on clinically asymptomatic intensive care unit (ICU) patients with a positive urine culture occurring at least 48 hours after catheterization.

METHODS. A prospective randomized clinical trial was conducted in medico-surgical ICU of a ter- tary care center. Patients admitted to ICU with an i- nfection. The patients with risk factors were pre-emptively placed under contact precautions until the results of the screening test (swabs from both naso- pharynx, respiratory tract, wounds and catheter tip) were negative.

RESULTS. Duration of positive urine culture was reduced in the study group, compared with the standard of care group (P = 0.07). The number of septic events occurring after inclusion was similar between the two groups. The profil of bacterial resistance was unaffected by the randomization.

CONCLUSION. Treating a positive urine culture in an asymptomatic patient with an indwelling urethral catheter decreases the duration of bacteriuria but is not beneficial in terms of outcome.

0684
METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS CONTROL PROGRAMME: IMPACT ON THE INTENSIVE CARE UNIT

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INTRODUCTION. Since its first description in the early 1960s, Methicillin-Resistant Staphylococcus Aureus (MRSA) gradually has spread within the hospital environment to become a major nosocomial pathogen in many hospitals worldwide. In our hospital, after the first MRSA case detected in 1998, the Epidemiologic Surveillance System (ESS) started up a MRSA control programme.

METHODS. The study was conducted in a public community hospital with 279 beds, with a medical-surgical ICU with 9 beds. The study (from 1999 to 2005) was applied to patients with risk factors (patients admitted from another ward or hospital, from residential care facility, and information on prior colonization or infection with MRSA during this admission) to develop MRSA colonization or infection. The patients with risk factors were pre-emptively placed under contact precautions until the results of the screening test (swabs from both nasal cavities, both inguinal areas and wounds) were found to be negative.

RESULTS. The ESS detected an increase in the MRSA cases during the study period in the hospi- tal (79 cases), but not in ICU (22 cases). The incidence rate of MRSA (per 1,000 patient days) in ICU was 2.3. MRSA cases were 68% male, mean age of 65.7, mortality rate was 59%, length of stay 36.5 days and 16.8 days from admission to infection. Twenty-two cases of MRSA were detected in ICU (15 acquired and 7 imported). The sites of infection were the respiratory tract (54.8%), operative wounds (22.6%), bacteremic infections (9/6%), catheter sepsis (3.2%), soft tissue (6.4%) and others (15.4%). During the same period, the ESS detected 2 colonized patients, 2 nurses of ICU colonized and 5 imported colonized patients (4 from general wards and 1 from residential care facility).

CONCLUSION. In our hospital, MRSA infections were found to be endemic. In our ICU, the con- trol programme (screening test and contact precautions) has demonstrated that the spread of MRSA infections among the patients can be prevented. In general wards, MRSA cases are increasing and thus, MRSA control strategies should be improved. The most frequent infections are related to the respiratory system.
**Introduction**

High mobility group box-1 protein (HMGB1) is a DNA-binding intranuclear protein. It is also released into the extracellular space by damaged and necrotic cells and acts as a potent pro-inflammatory cytokine. Some studies have shown that it acts as a late cytokine, which stays elevated several days after onset of severe sepsis. The aim of this study was to evaluate the predictive value of HMGB1 as regarding hospital mortality in adult patient population with severe sepsis and septic shock.

**Methods**

Finnish study was a prospective study about incidence and outcome of severe sepsis in Finland. All adult consecutive ICU admission episodes (4590) were screened for severe sepsis in 4 month period (from 1.11.2004 to 28.2.2005). Patients were eligible, if they fulfilled the ACCP/SCCM (1992) criteria for severe sepsis and septic shock. Blood samples for HMGB1 analyses were drawn after the consent on day 0 and after 72 hours. The serum HMGB1 levels were measured by Western immunoblotting analysis with rabbit polyclonal anti-HMGB1 antibodies (Biopharmingen, San Jose, CA). In addition, a pooled serum sample was used as an inter-assay (inter-test) control for semi-quantification HMGB1 levels in serum. The samples were compared with healthy controls (N=10) by Mann-Whitney test. Organ dysfunctions with SOFA-scores and ICU and in-hospital mortalities were recorded.

**Results**

Laboratory samples were obtained from 247 patient altogether. Mean age was 59 years (SD 15.6) and mean APACHE II and SAPS II scores 24 (SD 9) and 44 (SD17), respectively. 247 samples were obtained on baseline and 210 72 hours later. ICU mortality was 13.2% (n=33) and hospital mortality 26% (n=65) in study patients. Median HMGB1 levels of healthy controls were 98% (25th and 75th percentiles 91% and 119%) and after 72 h 107% (25th and 75th percentiles 99% and 120%), which differed statistically from healthy controls (p= 0.03 and 0.02, respectively). The ROC curve for day 0 or 72 h HMGB1-levels revealed the area under the curve 0.51 and 0.56 (95% confidence limits 0.40-0.61 and 0.47-0.65).

**Conclusion**

HMGB1 values were moderately elevated in severe sepsis and septic shock patients, but did not differ between survivors and non-survivors and were not predictive for hospital mortality in severe sepsis patients. Grant acknowledgement. EVO grant from Helsinki University Hospital

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**Table 1.**

| Patients with bacteriaemia (N=14) | Trauma patients without bacteriaemia (N=32) |
|----------------------------------|------------------------------------------|
| Men/women                        |                                          |
| Age (mean ± SD)                  |                                          |
| APACHE II score                  |                                          |
| Shock on admission (%)           |                                          |
| LOS (mean ± SD)                  |                                          |
| ICU mortality (%)                |                                          |
| LRSI (%)                         |                                          |
| Parenteral nutrition (%)         |                                          |

**Conclusion**

In our study bacteriaemia in trauma patients was associated with longer ICU stay, but not increased ICU mortality. There was a correlation between shock at the time of admission and PIh. The incidence of LRSI was significantly higher in bactericmic trauma patients. 4. Gram negative bacteria were by far the prevailing pathogens, in contrast to most published studies.

**References**

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**INTRODUCTION**

The purpose of our study was to determine the incidence rate and the incidence density of BSIs in Level 2 ICU patients. The incidence rate and the incidence density were 30% and 23.8%, respectively. One out of four patients needing concomitant respiratory therapy died. BSI and lower respiratory system infections (LRSI) were diagnosed according to CDC criteria.

**RESULTS**

Levels 1 transfers were due to Gram Negative in 2 patients (1), Coagulase Negative Staph in 4 patients (1), Staph aureus (6) and 16 (57.1%) survived from the acute episode. All three patients with Candida died [C. albicans (2); Candida species (2); Coagulase negative bacteria (2)].

**Conclusion**

The incidence rate and the incidence density were 30% and 23.8%, respectively. One out of four patients needing concomitant respiratory therapy died. BSI and lower respiratory system infections (LRSI) were diagnosed according to CDC criteria.
0689
SEPSIS AND INTERNAL MEDICINE: A BASELINE AUDIT OF ACUTE MEDICAL PATIENTS
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INTRODUCTION. Many patients presenting to our medical assessment unit (MAU) have an acute infective illness. Prior to formally implementing The Surviving Sepsis Campaign guidelines on MAU we wanted to assess current practice, and also quantify the severity and numbers of infections presenting to MAU.

METHODS. 11 cohorts of MAU patients were audited. Patients were only included once. An audit tool was designed and piloted. Patients with a documented admission diagnosis of infection were included as well as patients with a white blood count >6000/mm³ or >12000/mm³, temperature >38°C or <36°C, raised CRP or antibiotics prescribed since admission. Systemic inflammatory response syndrome (SIRS) criteria and blood pressure (BP) were markers of physiological status. The targets in the Surviving Sepsis resuscitation 6-hour care bundle were the benchmarks for good practice.

RESULTS. 202 patients (median age 71yrs, interquartile range 55-82yrs, 114 female) were audited. 102(51%), median age 75yrs, interquartile range 60-84yrs, 58 female) patients had evidence of an acute infection. Of the infected patients, 5 had a ystdle BP<90mmHg, 8 a MAP<65mmHg and 69 had 2 or more SIRS criteria. In all patients n=72 data available), 32% received antibiotics within 5hrs of arrival at hospital (median 3hrs 52 mins, interquartile range 2hrs 22mins-6hrs 55mins). For patients with 2 or more SIRS criteria (n=50 data available), 4% received antibiotics within 5hrs of arriving at hospital (median 3hrs 14mins, interquartile range 2hrs 6mins-3hrs 14mins). In all patients (n=45 data available), 36% had a blood culture taken within an hour of arriving at hospital (median 1hr 42mins, interquartile range 50mins-1hr 42 mins). In 3 patients, blood cultures were taken after antibiotics were given. In patients with MAP<65mmHg, fluid was initially run at 20ml/kg in only one patient and a lactate was measured in only one patient. Only one patient had a CVV line inserted.

CONCLUSION. 51% of patients on our MAU have an infection. The majority are elderly with significant physiological derangement when judged by SIRS criteria. There is a significant delay in the administration of antibiotics, even in those patients who are physiologically most unstable. This data support the view that a systematic approach to identify and treat septic patients on MAU is needed.

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0690
VEGF IN SEVERE SEPSIS AND SEPTIC SHOCK
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INTRODUCTION. Vascular endothelial growth factor (VEGF) is a well known mediator of angiogenesis and a potent vascular permeability factor. Few studies have shown decreased levels of VEGF in severe sepsis patients. The aim of this study was to evaluate the predictivity of VEGF regarding hospital mortality in adult patient population with severe sepsis and septic shock.

METHODS. The Finnsepsis study was a prospective study about incidence and outcome of severe sepsis in Finland. All adult consecutive ICU admission episodes (450) were screened for severe sepsis in a 4 month period (from 1.1.2004 to 28.2.2005). Patients were eligible, if they fulfilled the ACCP/SCCM (1992) criteria for severe sepsis and septic shock. Blood samples for VEGF analyses were drawn after the consent on day 0 and after 72 hours. The serum VEGF concentrations were measured in duplicate for each sample using a commercial enzyme-linked immunosorbent assay kit (R&D Systems; Minneapolis, MN; Sciences, UK). The samples were compared with healthy controls (N=10) by Mann-Whitney test. ICU and hospital mortalities were recorded.

RESULTS. Laboratory samples were obtained from 250 patients. Mean age was 59 years (SD 15.6), median age 68.5 yrs, interquartile range 53-82yrs, 114 female) were audited. Patients were only included once. An audit tool was designed and piloted. Patients with a documented admission diagnosis of infection were included as well as patients with a white blood count >6000/mm³ or >12000/mm³, temperature >38°C or <36°C, raised CRP or antibiotics prescribed since admission. Systemic inflammatory response syndrome (SIRS) criteria and blood pressure (BP) were markers of physiological status. The targets in the Surviving Sepsis resuscitation 6-hour care bundle were the benchmarks for good practice.

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RESULTS. In septic pts infusion of HES causes more significant decrease of procoagulant factors, than anticoagulant factors. These effects can be helpful at pts with sepsis.

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0691
PATTERNS OF CRP LEVELS IN ICU PATIENTS WITH NOSOCOMIAL BSI: IMPACT OF SOURCE OF INFECTION
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INTRODUCTION. Patients with nosocomial BSI secondary to pneumonia or intra-abdominal infections have been associated with worse outcome compared to those with other sources of infection. The aim of the study was to investigate whether patterns of CRP levels in ICU patients differ according to the source of bacteremia.

METHODS. A historical cohort was studied with inclusion of 155 adult ICU patients with nosocomial BSI over a two year period from 1 January 2003 until 31 December 2004. Daily CRP levels were recorded from two days prior to BSI until five days after onset of the BSI. For the purpose of analysis, sources of bacteremia were divided into 2 categories: low risk isis, urinary tract, IV-cather, soft-tissue, and primary sources of bacteremia) vs high risk (low respiratory tract and abdominal sources), respectively.

RESULTS. Mean age was 52.8±17.9 yrs. Of the 155 patients, 117 (75.5%) were defined with low risk vs 38 (24.5%) with high risk sources of bacteremia (P<0.001). Serum CRP concentrations were significantly different on the day of positive blood culture (13.6±6.4 vs 17.4±10.8; P=0.026), and one day after onset of BSI (15.6±8.7 vs 19.5±10.4; P=0.037). For all other days (day -2, -1, +2, +3, +4, and +5) no statistically significant differences were found between both groups (see Fig. 1).

CONCLUSION. In ICU patients with nosocomial BSI different patterns of CRP levels on day 0 and day +1 are seen according to the source of infection (low risk vs high risk).

0692
INFLUENCE OF HIDROXYETHYL STARCH (HES) ON HEMOSTASIS IN PATIENTS (PTS) WITH SEPSIS
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INTRODUCTION. Important part of the pathophysiology of sepsis is caused by inappropriate coagulation in the microcirculation. It is known, that haemodilution causes enhancement of coagulation owing to imbalance between procoagulant and anticoagulant factors. HES are often used for correction of hypovolaemia in pts with sepsis. The aim of this study was investigation of the effects of infusions of HES on the hemostasis in septic pts.

METHODS. 20 pts received HES 130/04 (Volvulen, Fresenius-Kabi) 13.7±1.5 mlkg within 24 hours. During infusion of HES all other infusions were stopped. Before and after infusions we measured in plasma activated partial thromboplastin time (APTT), prothrombin index (PI), activities of antithrombin III (AT III), factor VIII (FVIII), protein C (PC), plasminogen (PG), Willebrand factor (WF), levels of fibrinogen and soluble fibrin monomer complexes (SFMC).

RESULTS. Septic pts had increased levels of FVIII, WF, SFMC and decreased levels of PC, AT III, PG. Infusion of HES decreased levels of fibrinogen, PG, FVIII, WF, PC. Procoagulant factors have decreased more expressed, than anticoagulant factors. APPT before infusion was 34.5±11.7 s. APPT and SFMC did not change after infusion.

Table 1. Before infusion After infusion Changes in relation to initial parameters
| Fibrinogen, g/l | 4.1±0.4 | 3.7±0.3* | 8.6±4% |
| FVIII,% | 280±31 | 234±21* | 17.6±6.3% |
| FV, % | 221±6.2 | 163±16* | 26.7±8.6% |
| PI, % | 73±4 | 67±3* | 9.3±1.6% |
| AT III, % | 90±3.5 | 83±4* | 7±2.5% |
| PC, % | 69±7.2 | 60±7.5* | 14.4±4.3% |
| SFMC, µg/100ml | 18±4 | 6±1 | 9.8±6.8% |
| PG, % | 68±5.4 | 59.7±4.6* | 12.8±2.9% |

*p<0.05

CONCLUSION. In septic pts infusion of HES causes more significant decrease of procoagulant factors, than anticoagulant factors. These effects can be helpful at pts with sepsis.

Grant acknowledgement. Fond of assistance to the Russian medicine.
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NOSOCOMIAL BACTEREMIA AT Pediatric INTENSIVE CARE UNIT - University CHILDREN'S Hospital BELGRADE

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INTRODUCTION. The retrospective study of nosocomial bacteremia in patients hospitalized at Pediatric Intensive Care Unit (PICU)-University Children's Hospital Belgrade, from year 2003 till 2008. We determined the frequency, the sources, microbiological identification and outcome.

METHODS. Blood culture results were reviewed daily. All patients with positive blood culture 48h after admission were included in this study. The sources of infection have been detected by clinical and/or microbiological criteria. Patients were followed until discharge or death.

RESULTS. During this two years 475 patients were hospitalised at PICU and 156 (33%) patients had nosocomial bacteremia. The sources of bacteremia were: intravascular catheters (37%), respirator tract (12%), urinary tract (10%), surgical sites (6%). We have not detected sources in 35% of these patients. The survival rate was 67%. The results of microbiological analysis were: Staphylococcus aureus (21%), Pseudomonas aeruginosa (16%), Klebsiella pneumoniae (11%), Acinetobacter (9%), Enterobacter species (8%) and other (32%). In-hospital mortality associated with Pseudomonas species (54%) was significantly higher than for other bacteria (26-37%) and Pseudomonas species also was highly resistant on antibiotic therapy.

CONCLUSION. All information from this study are very important for more successful and more accurate treatment and prevention of intrahospital infections.

Grant acknowledgement. Serbian Medical Society.

0694

CENTRAL VENOUS CATHETERS COLONIZATION AND INFECTION: RESULT OF 7 YEARS OF SYSTEMATIC SCREENING

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INTRODUCTION. Central venous catheters (CVC) are of common use in the ICU. They are known to be associated with a high risk of bacterial colonization and subsequent septicemia. The aim of the present study was to describe the colonization and the CVC-related bloodstream infections (CRBI) in a population of surgical ICU patients.

METHODS. Prospective, observational study. 11 beds surgical ICU of a Parisian University Hospital. Between 1997 and 2004, CVC were systematically analyzed. CVC were systematically removed after 5 days before 2000, 7 days after 2000. CVC were considered as colonized for more than 103 bacteria/ml. CRBI was defined as the association of a positive CVC and a positive blood culture within a period beginning 2 days before catheter removal and lasting until 2 days after CVC removal. For Coagulase-negative Staphylococcus, 2 blood cultures were needed. Data were expressed as mean +/- SD. Statistical analysis was performed using Chi-2 tests and Student t Tests. p<0.05 was considered as significant.

RESULTS. Among 1400 patients, 3395 CVC were analyzed over a 7 years period. 6146 males/7866 females, age: 48+/-20 yrs, SAPS2: 35+/-17, APACHE2: 16+/-9, Length of stay: 10+/-13 days. Catheterism length was of 4.7+/-3.6 days before 2000, and 5.8+/-4.6 days after 2000 (p<0.0001). 536 AC were considered as positive (16.4%). Coagulase-negative Staphylococci (61.1%) and Enterobacter species (8.6%) were the most frequent microorganisms. CRBI were associated to greater severity scores (SAPS2: 53.6 vs 40.3, p<0.0001; APACHE2 : 26.3 vs 18.5, p<0.0001) and a greater incidence of renal failure (p=0.0002). Rate of CRBI did not seem to be affected by catheterism length (6.6 vs 5.4; p=0.1). A greater ICU mortality was observed in case of CRBI (26.7% vs 16.6%, p=0.008).

CONCLUSION. ACBI incidence seems to be influenced by patients’ severity but not by catheterism length. In this group of patients, ACBI were associated with a greater ICU mortality.

0695

ARTERIAL CATHETERS COLONIZATION AND INFECTION: RESULT OF 7 YEARS OF SYSTEMATIC SCREENING

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INTRODUCTION. Arterial catheters (AC) are invasive devices often used in ICUs. Very few data are available concerning AC infections and particularly AC-related bloodstream infections (ACBI). The aim of the present study was to describe the risk factors, the severity and the prognosis of ACBI.

METHODS. Prospective, observational study. University hospital 11 beds surgical ICU. Between 1997 and 2004, all AC were microbiologically analyzed. All AC were systematically removed or replaced after 5 days before 2000, 7 days after 2000. Positiveity threshold was of 103 bacteria. The association of a positive AC and a positive blood culture (within a period lasting from 2 days before to 2 days after the AC removal) defined an ACBI. For Coagulase-negative Staphylococcus, 2 blood cultures were needed. Data were expressed as mean +/- SD. Statistical analysis was performed using Chi-2 tests and Student t Tests. p<0.05 was considered as significant.

RESULTS. 5259 AC in 1899 patients were analyzed over a 7 years period. 898 females/1051 males, age: 48+/-20 yrs, SAPS2: 35+/-17, APACHE2: 16+/-9, Length of stay: 10+/-13 days. Catheterism length was of 4.7+/-3.6 days before 2000, and 5.8+/-4.6 days after 2000 (p<0.0001). 536 AC were considered as positive (16.4%). Coagulase-negative Staphylococci (60.1%) and Enterobacter species (13.1%) were the most frequently observed bacteria. CRBI were associated with a greater severity scores (SAPS2: 53.6 vs 40.3, p<0.0001; APACHE2 : 26.3 vs 18.5, p<0.0001) and a greater incidence of renal failure (p=0.0002). Rate of ACBI did not seem to be affected by catheterism length (6.6 vs 5.4; p=0.1). A greater ICU mortality was observed in case of ACBI (26.7% vs 16.6%, p=0.008).

CONCLUSION. ACBI incidence seems to be influenced by patients’ severity but not by catheterism length. In this group of patients, ACBI were associated with a greater ICU mortality.

Poster Sessions

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0696

MONITORING OF BRAIN TISSUE PO2: RELATIONSHIP TO OUTCOME AFTER SEVERE BRAIN INJURY

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INTRODUCTION. Brain tissue oxygen monitoring is a part of multimodal monitoring. Prevention of secondary brain injury is crucial. Values of parcell brain oxygen pressure (pbtO2) in first hours after brain trauma should predict final patients outcome. The aim of this study was to analyze relationship of early values of brain oxygen in severe head trauma to outcome.

METHODS. We analyzed data of 18 consecutive adults patients treated in our ICU during time period of 24 months for severe head trauma with Glasgow coma scale (GCS) 8 and less and with monitoring of intracranial pressure (ICP) and partial brain oxygen pressure (pbtO2). We used Codman Neutrotrend multiparameter sensor for pbtO2 monitoring. We placed Neutrotrend sensor at the same time as ICP sensor and we used non injured side of brain for application. All patients were treated according standard therapeutic protocol. Target of our treatment was to reach optimal pbtO2 levels. Comprehensive reports of biological data were made in all patients. We compared data of first 24 and second 24 hours after start of the treatment in ICU with neurological status in the time of leaving ICU among three groups: non survived patients, patients with neurological disability and patients with normal levels of consciousness.

RESULTS. Mean of pbtO2 in the group of non survivors (4 pts) was during first 24 hours 25.99 mmHg and during second 24 hours 21.28 mmHg. Mean of pbtO2 in the group with neurological disability (9 pts) was during first 24 hours 19.91 mmHg and during second 24 hours 15.07 mmHg. Mean of pbtO2 in the group with normal level of consciousness (5 pts) was during first 24 hour 26.31 mmHg and during second 24 hours 26.61 mmHg. We calculated this mean from all measured values during followed time periods and in the individual groups of patients.

CONCLUSION. We did not find in our group clear relationship between values of pbtO2 and outcome. Monitored values of pbtO2 are dependent on variety of factors during measuring process (e.g. placement in area of lesion or non lesion, depthness of sensor). We consider pbtO2 monitoring as a method to become additional informations for proper adjustment of therapy.
0697
QUININE INTOXICATION: CINCHONISM AND BLINDNESS
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INTRODUCTION. Quinine is obtained from the bark of various species of Cinchona. It is used for the treatment of falciparum malaria as well as for nocturnal leg cramps. Quinine or its salts given in usual therapeutic doses may give rise to a train of symptoms known as cinchonism. This is characterised by mild form by tinnitus, impaired hearing, headache, nausea and disturbed vision, with in its more severe manifestations, vomiting, abdominal pain, diarrhea and vertigo. The main symptoms of quinine overdose, which can be fatal, include gastrointestinal effects, oculotoxicity, CNS disturbances and cardiotoxicity. Specialist information and advice on the treatment of poisoning is available in the United Kingdom from the National Poisons Information Service through local poisons information centres. TOXBASE, the primary clinical toxicology database of the National Poisons Information Service, is also available on the Internet to registered users (www.spib.axl.co.uk) providing information about routine diagnosis, treatment and management of patients exposed to drugs, household products, industrial and agricultural chemicals.

METHODS. We undertook a case study and literature review.

RESULTS. An 18-year old girl ingested 5.7g of quinine sulphate with resulting peak serum concentration greater than 165mcg/ml. Initially she suffered with headache, nausea and tinnitus but these progressed to more severe symptoms, including transient loss of visual acuity together with evidence of cardiac disturbances. Advice from a poisons information centre specialist on the management of quinine intoxication focused on decontamination with repeated doses of activated charcoal both in an attempt to limit absorption from the gastrointestinal tract as well as enhancing quinine elimination. Additionally general supportive measures were advised and included correction of electrolyte disturbances, treatment of hypotension, monitoring for cardiac dysrhythmias and assessment of renal function. Glyceryl trinitrate was infused for the visual disturbances she experienced approximately 12-hours following quinine ingestion. Electrocardiographic abnormalities of conduction delay were managed conservatively. She recovered vision after a period of partial blindness.

CONCLUSION. Overdose with antimalarial agents is hazardous and can be difficult to treat. Specialist information in our case focused on decontamination together with empirical vasodilator therapy for ocular toxicity. These interventions were associated with reductions in serum quinine levels and clinical improvement.

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0698
ACUTE MECHANICAL LARGE BOWEL OBSTRUCTION: CLINICAL PRESENTATION, MANAGEMENT AND OUTCOME
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INTRODUCTION. Acute mechanical large bowel obstruction is a common surgical emergency. Our aim was to identify and analyse the clinical features of these patients along with their management and outcome.

METHODS. This is a prospective study of all patients admitted to our hospital with acute mechanical large bowel obstruction between January 2004 and August 2004. Recorded variables were: age, gender, time between the onset of symptoms and arrival at the emergency department, initial vital signs, pre-existing medical conditions, type of management, time between admission and operation, complications, admission in the Intensive Care Unit (I.C.U.), mortality, and length of hospital stay.

RESULTS. Twenty-four consecutive patients with mechanical large bowel obstruction were admitted. Mean age was 63.6 years; twelve men (50%) and 12 (50%) women. Mean time between the onset of symptoms and arrival at the emergency department was 48.4 hours. Mean systolic arterial blood pressure, diastolic pressure, heart rate, breathing rate, and body temperature on arrival were 117.1mmHg, 61.6mmHg, 83.7 per minute, 15.7 per minute, and 36.5°C, respectively. The predominant presenting symptom was absence of passage of flatus and/or stool (n=22, 91.7%) while 18 patients (75%) had vomiting, 14 (58.3%) nausea, 18 (75%) abdominal discomfort, 16 (66.7%) colicky abdominal pain, and 6 (25%) continuous passive of flatus and/or stool (n=22, 91.7%) while 18 patients (75%) had vomiting, 14 (58.3%) nausea, 18 (75%) abdominal discomfort, 16 (66.7%) colicky abdominal pain, and 6 (25%) continuous passive of flatus and/or stool (n=22, 91.7%) while 18 patients (75%) had vomiting, 14 (58.3%) nausea, 18 (75%) abdominal discomfort, 16 (66.7%) colicky abdominal pain, and 6 (25%) continuous passive of flatus and/or stool (n=22, 91.7%) while 18 patients (75%) had vomiting, 14 (58.3%) nausea, 18 (75%) abdominal discomfort, 16 (66.7%) colicky abdominal pain, and 6 (25%) continuous passive of flatus and/or stool (n=22, 91.7%) while 18 patients (75%) had vomiting, 14 (58.3%) nausea, 18 (75%) abdominal discomfort, 16 (66.7%) colicky abdominal pain, and 6 (25%) continuous passive

0700
WOUND BOTULISM IN AN INTRAVENOUS DRUG USER
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INTRODUCTION. Closstridium botulinum is an anaerobic spore forming bacterium. Spores contaminate wounds, germinate and produce neurotoxin. Seven neurotoxins A-G have been identified, which bind to the presynaptic membrane at the neuromuscular junction, blocking the release of acetylcholine and resulting in a descending flaccid paralysis. Neurotoxin has a high affinity for the receptors causing slow recovery which begins only when new receptors have formed. Soft tissue infections caused by spore-forming bacteria have emerged as a serious problem in intravenous drug users (IDUs). Higher purity heroin permits IDUs who have lost access to veins to use subcutaneous or intramuscular routes, so called ‘skin-popping’ and ‘muscule-popping’. Use of large amounts of citric acid as a solvent for the heroin or drug contamination may increase tissue damage at the injection site. An anaerobic environment facilitates the germination of C. botulinum.

METHODS. We undertook a case study and literature review.

RESULTS. A 42-year old woman with a twenty year history of heroin addiction presented to the Emergency Department, Homerton University Hospital with hypotension, atelectasis and respiratory failure. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her gait. She had poor venous access and relied on the subcutaneous route, ‘skin-popping’, to sustain her
0701
ACUTE LARGE BOWEL MECHANICAL OBSTRUCTION: CAUSES AND INCIDENCE OF PERFORATION, ISCHEMIA AND NECROSIS
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INTRODUCTION. Our aim was to analyze the etiology of acute mechanical large bowel obstruction and to evaluate the incidence and causes of bowel perforation, ischemia and necrosis.

METHODS. This is a prospective study of all patients admitted to our hospital with acute mechanical large bowel obstruction between January 2005 and December 2005. Recorded variables were: type of management, operative findings, incidence and causes of bowel perforation, ischemia and/or necrosis, and etiology of obstruction.

RESULTS. Among the 24 consecutive patients with mechanical large bowel obstruction, 6 (25%) were treated conservatively and 18 (75%) were operated. Intraoperatively, no case of reversible bowel ischemia was observed. In contrast, large bowel necrosis was found in 4 patients (16.7% and 22.2% of the study group and the operated group, respectively), perforation of the necrotized large bowel in 3 (12.5% and 16.7% of the study group and the operated group, respectively) and small bowel perforation in one patient (4.1% and 5.5% of the study group and the operated group, respectively). Sigmoid carcinoma was the most common cause of obstruction accounting for 54.1% and 66.6% of the study group and the operated group, respectively. Adhesions were the second most common cause accounting for 29.1%, 16.7%, and 66.6% of the study group, the operated group, and the nonoperatively treated group, respectively. Sigmoid volvulus in 4 (2% and 5.5% of the study group and the operated group, respectively), diverticulitis in 1 (4.2% and 16.7% of the study group and the nonoperatively treated group, respectively), sigmoid volvulus in 1 (4.2% and 5.5% of the study group and the operated group, respectively), and ovarian cystadenocarcinoma in 1 patient (4.2% and 5.5% of the study group and the operated group, respectively). Etiology of large bowel necrosis was sigmoid adenocarcinoma in 1 patient (25%), adhesions in 1 (25%), incarcerated umbilical hernia in 1 (25%), and sigmoid volvulus in 1 patient (25%). Three of the 4 patients with necrotized large bowel had large bowel perforation 1 with sigmoid adenocarcinoma: 33.3%, 1 with adhesional obstruction: 33.3%, and 1 with incarcerated umbilical hernia: 33.3% while 1 patient (adhesional obstruction) presented concomitant small bowel perforation.

CONCLUSION. In our study, sigmoid carcinoma and adhesions were the most common causes of acute mechanical large bowel obstruction. Great caution should be paid on treatment of these patients since the incidence of bowel perforation and necrosis is significantly high.

0702
KETAMINE IN REFRACTORY STATUS EPILEPTICUS
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INTRODUCTION. New treatments are needed to control prolonged status epilepticus given the high failure rate of current therapies.

METHODS. We report the case of a forty-five years old woman admitted in our critical care unit for a Glasgow-scale 3 coma.

RESULTS. The electroencephalographic monitoring showed a non-convulsive status epilepticus. The morphological explorations with cerebral CT-scan and RNM were strictly normal. Two lumbar puncture were negative. No etiology was found (infectious, immunological, traumatic, toxicologic and vascular aetiologies). The recommended treatments with benzodiazepines and phenytoin were ineffective. Barbituric coma with pentothal was induced during twenty days but ineffective. Valproic acid and propofol were also ineffective. Then ketamine at the posology of 2mg/kg/24h was introduced and broke this refractory status epilepticus in two hours. Intravenous support was performed during ten days and the posology of ketamine slowly decreased.

CONCLUSION. Ketamine is a non-competitive N-methyl-D-aspartate (NMDA) receptor antagonist. It has been used in a few cases of prolonged refractory status epilepticus (1,2). Pharmacological treatment of seizures, including status epilepticus, is therefore often directed at potentiating GABAergic inhibition; but functional modification of GABA-A receptors has been described in status epilepticus and this may account for increasing resistance to GABAergic anti-convulsive agent, such BZD2 and barbiturics. The management of refractory status epilepticus could therefore include use of NMDA-receptor antagonists, such as ketamine. We discuss with this case-report about indication and optimal posology of ketamine in refractory status epilepticus.

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0703
BISPECTRAL INDEX MONITORING CORRELATES WITH SEDATION SCALES IN OPERATIVE NEUROSURGICAL PATIENTS
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INTRODUCTION. Maintaining an optimal level of comfort and safety for critically ill patients is an universal goal for critical practitioners. The assessment of sedation level remains a challenge for the intensivist in order to avoid over- or under- sedation phenomena. The indroduction of the bispectral index (an EEG parameter) could bring potential advantages in monitoring sedation. According to the reports, the Richmond Agitation-Sedation Scale (RASS) has been shown to be highly reliable among multiple types of healt care professionals. The RASS has an expanded set of scores at pivotal levels of sedation that are determined by practitioners’ response to verbal vs physical stimulation, which will help the clinician in titrating medication.

METHODS. This is a prospective, nonrandomized, observational study in a surgical and trauma tertiary intensive care of an university hospital. Twenty-six consecutive neurosurgical postoperative patients (age range 17-68 yrs, mean age 44 yrs) were included. They were sedated (with propofol by continuous infusion at an initial dose of 2 mg/kg/h, which could be modulated with steps of 0.5 mg/kg/h), in order to maintain an adecuated RASS score. BIS value was continuously recorded, and manually calculated on a mean average of a minute during the measuring of RASS score, and every 10 minutes for 6 hours on par with RASS score. ECG, SpO2, invasive arterial pressure, ventilatory module, ETCO2, FO2, temperature were also recorded. For the statistic analysis, Friedman test and Spearman coefficient were utilized.

RESULTS. Nine hundred and thirty-six observations were carried out. The variation range of RASS score was between 0 and -5. BIS range varied from 27 to 96. Statistics analysis of the data obtained pointed out a significative correlation between RASS score and BIS (p < 0.01).

CONCLUSION. According to the reports, Bispectral index correlates with levels of sedation on the RASS scale. In our personal experience, this study demonstrates the utility of BIS and RASS score to track levels of sedation in neurosurgical postoperative patients.

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0704
REPORT OF TRACHEOSTOMY IN A NEUROTRAUMA ICU
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INTRODUCTION. Tracheostomy represents a prevalent technique in intensive care unit (ICU), and many advantages are attributed to it thought there were many questions about tracheostomy that still need to be answered. In our ICU, tracheostomy in neurotrauma is performed with surgical and neurological neuropathology adding particular points. The purpose of this study was to describe tracheostomies carried out in a neurotrauma ICU, characteristics and outcomes of those.

METHODS. Observational study about patients who required tracheostomy for 2005. All patients who received tracheostomy in ICU were included except if they were exits in the unit. We collected demographies, admission reason, APACHE II, extubation failure, tracheostomy reason, days from intiation of ventilation to tracheostomy, from tracheostomy to weaning, from tracheostomy to discharge from ICU, type of tracheostomy procedure (surgical versus percutaneous), complications of the technique, ICU length of stay (LOS), type of tracheostomy necessity, pneumonia and late complications. Continuous variables are expressed as means ± standard error and medians and interquartile ranges are given. Categorical variables are expressed as absolute frequencies and were compared using x2 test. Continuous and categorical variables were compared using t-test.

RESULTS. Of 537 admissions, 10.6% required tracheostomy and 12 of them were exits, so our sample made up of 44 patients: 77% were men with age of 47.73 ± 17.92 years. Admission reason were distributed in 52% trauma, 43% neurological/neurosurgical and 4% of other etiology. APACHE II was 19.82 ± 6.467. Extubation failure was observed in 36%. The more frequent reason for tracheostomy was the neurologic situation (60%). Time admission-tracheostomy was 13.25 ± 6.078 days, time ventilation after tracheostomy had a median of 2 days with p<25 of 1 day and p75 of 5 days. Surgical technique was the more frequently (70.5%). No complications were observed in 91%, only 6.8% of hypotension and one case of no mayor haemorrhage. Not difference were observed between surgical and percutaneous technique neither in appearance complications, nor ICU length of stay, nor time of ventilation after tracheostomy. Pneumonia was observed in 66% and these patients had a bigger time from admission to tracheostomy than the rest (14.77 ± 6.328 vs 10 ± 4.010 p= 0.01). ICU LOS was 28.68 ± 14.79 days. Time of need of tracheostomy was 35.16 ± 15.908 days and the 87% had not late complications.

CONCLUSION. In our ICU the more frequent reason for tracheostomy was the neurologic condition, predominating surgical procedure without complications during the technique and without late complications. Tracheostomy timing is relateded with complications as pneumonia.
0705
FLUID THERAPY WITH GLUCOSE SOLUTIONS IN PATIENTS WITH SEVERE TRAUMATIC BRAIN INJURY
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INTRODUCTION. Administration of glucose solutions in patients with severe traumatic brain injury (TBI) is controversial. From the one hand glucose is the main energy substrate for the injured brain. From the other hand hyperglycemia can lead to the hyperosmolality, lactate acidosis, and increase in incidence of poor neurological outcome and infection complications.

METHODS. 107 patients with severe TBI enrolled in the study. Patients were randomized into two groups. In the first group glucose solutions were not used as a component of fluid therapy (“Saline” group). As a basic fluid therapy patients received only normal saline and colloids if necessary. Patients of the second group were administrated the same basic fluid therapy, but 30-40% of all intravenous fluid amount was given by 10% and 20% glucose solutions (“Glucose” group). Hypoosmotic 5% glucose solution was never used. “Nutrison-energy” (Nutricia) 30-40 kcal/kg/day was used for enteral nutrition. Patients of the both groups were of the same age, gender, Glasgow Coma Scale (GCS) on admission to the ICU and the length of the ICU treatment. Serum glucose levels, GCS, pneumonia and meningitis incidence, neurological outcomes according to Glasgow Outcome Scale (GOS) were analyzed and compared between the groups.

RESULTS. The serum glucose level on admission to the ICU was (M±SD) 8.4 ± 3 mmol/l in “Glucose” group and 7.9 ± 2.1 mmol/l in the “Saline” group (p>0.05). In the “Glucose” group neurological status improvement in the acute period of TBI was observed in 23 patients (32.9%), but in the “Saline” group only in 25 patients (39.7%) (p=0.05). Pneumonia incidence was 32.2% in the “Glucose” group and 48% in the “Saline” group (p>0.05). Meningitis occurred in 11.5% of patients in the “Glucose” group and in 8% of patients in the “Saline” group (p>0.05). Poor neurological outcomes and mortality (GOS 1.2) were the same in both groups (48% of patients).

CONCLUSION. Hypertonic glucose solutions don’t worsen the neurological outcome and have no influence on the infection complications incidence in patients with severe traumatic brain injury.

0706
EARLY PERCUTANEOUS DILATATIONAL TRACHEOSTOMY IN PATIENTS WITH SEVERE BRAIN INJURY WITH ELEVATED ICP
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INTRODUCTION. Basal skull fractures with CSF rhinorrhea and the craniofacial injury that requires plastic surgery are usually from the list of the main indications for the early PDT (less than 72hrs) in patients with severe brain injury. An ICP elevation is of great risk and thus limitations arise. From the position of applied medicine, we modified the PDT technique, taking into the consideration the need for intracranial hypertension avoidance.

METHODS. The investigation represented a prospective observational trial based upon the analysis of PDT procedure in 24 patients with severe traumatic brain injury. GCS 4-8. Continuous ICP monitoring was placed just as SpO2 and ETCO2. One of the inclusion criteria was ICP elevated (22-35 mmHg). We were striving for ICP below 20 mm Hg as a first step. We also performed a test with an ICP reaction to the horizontal positioning beforehand. The endoscopic PDT, Griggs set was used. A discrete endoscopy never exceeded 60 sec. The modification included the peculiarities of the patient positioning: head of the bed elevation - 30°, avoiding neck extension.

RESULTS. According to the level of an ICP increase the collected results were divided for two groups. The first group consists of patients whose ICP was never above 25 mm Hg throughout the procedure. The second group is precisely the same contingent based on the traits of pathology but we use to depict an ICP increase over 25 mm Hg. An elevation during procedure never exceeded 5 min. Analyzing the date we came to the conclusion that best results were obtained if favorable ventilation is maintained. The ratio between the diameters of the endotracheal and endoscope supposed to be not less than 3/2.

CONCLUSION. In patients with severe TBI, complicated by elevated ICP, a timely performed PDT (within 72 hrs) can be safe if modified technique is used.

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0707
COMPLEMENTARY VALUE OF CT AND TEE IN THE DIAGNOSIS OF AORTIC TRAUMA
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INTRODUCTION. Transoesophageal echocardiography (TEE) and computed tomography (CT) are routinely used in the emergency and intensive care settings for the evaluation of patients with blunt thoracic trauma and suspected traumatic aortic injury (TAI). We report two cases of traumatic aortic rupture in which the CT scan evaluation was negative for TAI and the suspected diagnosis was confirmed by TEE.

METHODS. The records of all consecutive trauma patients treated between January 2003 and January 2006 in our intensive care unit were retrospectively reviewed.

RESULTS. The records of 110 trauma victims were evaluated. 40/110 (36%) had blunt chest trauma among other injuries and/or fractures of the upper ribs, sternum, and/or clavicles on the initial chest X-ray. These patients were evaluated using both CT and TEE. No patient had evidence of TAI on CT. However, two patients with negative CT scans showed evidence of TAI on TEE; one patient had ischemic rupture and the other intramural hemaoma.

CONCLUSION. Both CT and TEE have high sensitivity and specificity in the diagnostic evaluation of TAI. To minimize the risk of diagnostic errors in this potentially catastrophic situation, CT & TEE should be considered as complementary tests.

0708
MRI FINDINGS IN CEREBRAL FAT EMBOLISM: NO CORRELATION WITH CLINICAL EVOLUTION
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INTRODUCTION. Neurological signs of fat embolism (FE) are rarely alone (1). The diagnosis of cerebral fat embolism (CFE) is difficult and MRI may be very helpful (2).

METHODS. This observation is particular with the severity of neurological manifestations and the contrast between MRI findings and clinical evolution.

RESULTS. A 38year-old man was admitted in our ICU for car crash injury with an isolated uncomplicated closed fracture of the leg. The patient was fully conscious. The fractures were initially stabilised by osteosynthesis. He presented an acute respiratory distress and became unconscious 12 hours later. Blood gas analysis showed a PaO2/FiO2 of 78mmHg. Despite respiratory amelioration, neurological deficit persists: he was unresponsive and with tetraparesia. A MRI diffusion-weighted revealed multiple high intensity signals throughout the white matter, the basal ganglia, the corpus callosum (Fig1). Evolution was marked by a clinical improvement with no neurological sequelae. He was discharged after 25 days. A control MRI showed a total regression of lesions (Fig2).

CONCLUSION. The pathogenesis remains controversial. Systemic fat emboli can pass through the pulmonary vasculature (3). Cerebral manifestations of CFE are highly variable and non-specific and lead to poor outcome. The lesions after CFE (4) has been characterized as high intensity signals in the deep white matter in T2-weighted images, and graded them into 4 categories according to the severity of brain lesions.

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0709
HYPERTONIC SALINE AND MANNITOL EFFECTIVENESS EVALUATION IN PATIENTS WITH INTRACRANIAL HYPERTENSION
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INTRODUCTION. Mannitol and hypertonic saline are widely used for intracranial hypertension treatment. The best method of their effectiveness control is invasive intracranial pressure (ICP) monitoring. But it is impossible in all Intensive Care Units. Therefore it’s useful to find simple methods of mannitol and hypertonic saline effectiveness assessment.

METHODS. We investigated 12 patients with intracranial hemorraghe. All patients had invasive ICP monitoring (Codman). ICP elevation above 18 mm was an indication for treatment. In order to decrease ICP we used 15% mannitol – 400 ml,1.5 g/kg/h (+20%) and 10% Sodium Chloride, 400 ml/h (+6%). The ICP plasma osmolality, sodium serum level and neurological signs of brain stem dislocation were studied before and after infusion.

RESULTS. 10% NaCl infusion decreased ICP from (M±s) 29.5±8.3 mm Hg to 15.6±6.8 mm Hg (P<0.05) and was followed by serum sodium level increase from 141±1.9 mmol/l to 146±1.5 mmol/l (P<0.05). Serum osmolality didn’t change (2806±6 mosmol/kg vs 293±12 mosmol/kg). Positive changes in neurological status were seen only in 2 patients (33%). Mannitol infusion was followed by ICP decreasing from 30.3±8.8 mm Hg to 19.8±9.6 mm Hg (P<0.05), and plasma osmolality increasing from 296±20.2 mosmol/kg to 312±16.9 mosmol/kg (<0.05). No marked changes in serum level sodium were observed (145.3±2.8 mmol/l vs 145.5±4.7 mmol/l). Positive changes in neurological status were observed in one patient (17%). Changes in ICP and osmolality after 10% NaCl and mannitol infusion differed non-significantly between groups.

CONCLUSION. 1)10% NaCl and mannitol effectively decrease ICP
2) Invasive ICP monitoring is the best method of mannitol and hypertonic saline effectiveness assessment.
3) Serum sodium level (in case of 10% NaCl) and serum osmolality (in case of mannitol) could be used as alternative methods of hypertonic saline and mannitol effectiveness control.
4) Neurological examination can’t reflect ICP changes during hypertonic saline and mannitol infusion.

0711
NOVEL ROLE OF THE MITOCHONDRIAL F1F0-ATPASE IN CARDIOPROTECTION
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INTRODUCTION. The mitochondrial K-ATP dependent channel (mito K ATP) is a key actor in cardioprotection and preconditioning (1). However the precise structure of this channel remains unknown. Under certain conditions, F0F1 ATPase is a channel which can also conduct potassium (2).

METHODS. By using siRNA techniques on cardiomyocytes, we decreased IF1 expression, a regulator of F0F1 ATPase. With confocal microscopy, we studied flavoproteins oxidation, a marker of mitochondrial states (3). Serum sodium level (in case of 10% NaCl) and serum osmolality (in case of mannitol) could be used as indicators of mitochondrial damage.

RESULTS. In the presence of Dz, flavoproteins fluorescence is decreased. With confocal microscopy, we observed decreases in mitochondrial states (4).

CONCLUSION. This suggests that F0F1 ATPase may be the mito K ATP.

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Poster Sessions
Cardiac problems in the ICU 0710-0723

0710
LOGISTIC FITTING TO DECEAY OF CA2+ TRANSIENT IS SUPERIOR TO MONOEXPONENTIAL FITTING IN MURINE PAPILLARY MUSCLE
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INTRODUCTION. A decrease in myocardial intracellular calcium concentration ([Ca2+]i) precedes myocardial relaxation. A monoeponential function has been used for fitting the decay of Ca2+ transient. A logistic function has been shown to better fit the isometric relaxation force curve than the conventional monoeponential function. In the present study, we compared the logistic and monoeponential fittings to the [Ca2+]i decline.

METHODS. We analyzed the [Ca2+]i declines from four different starting points: the minimum values, the baseline values, the middle values and the base line values of the Ca2+ transient. A logistic function has been shown to better fit the isometric relaxation force curve than the conventional monoeponential function. In the present study, we compared the logistic and monoeponential fittings to the [Ca2+]i decline.

RESULTS. The logistic fittings for the four [Ca2+]i declines were significantly better than the monoeponential fittings in terms of correlation coefficient and residual mean squares. Ca2+ transient decreases were smaller in the logistic fittings than in the monoeponential fittings. The logistic fittings explained a larger portion of the variance in the [Ca2+]i decreases than the monoeponential fittings.

CONCLUSION. The logistic fitting for the [Ca2+]i decline is superior to the monoeponential fitting at any onset in the murine muscle. Logistic function fitting more reliably characterizes the decay of Ca2+ transient.

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0712
LATE EFFECTS ON CARDIAC FUNCTION IN PEDIATRIC SEPTIC SHOCK SURVIVORS
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INTRODUCTION. Septic shock (SS) is a life-threatening disease, characterized by impaired myocardial contractility and loss of vascular tone, often requiring treatment with vasoconstrictive agents (VA). Data on long term effects of SS and VA on the developing myocardium in SS-survivors are lacking. We hypothesize that the combination of the underlying illness and the side-effects of its treatment will result in permanent damage of the developing heart in children.

METHODS. SS survivors admitted to our tertiary PICU between 1995 and 2004 and received administration of VAs ≥ 24 hours were included. Cardiac function was evaluated by ECG in rest and during exercise (when > 7 years), 24-hours-EKG-registration and echocardiography. Age at admission and follow-up, severity of illness (PIM II score), length of PICU stay were evaluated.

RESULTS. Ninety of 124 eligible patients were evaluated. In 14 patients abnormalities were detected; such as episodes of ventricular extrasystole during and after exercise (n=3), rhythm disturbances on 24-hours-EKG-registration and mild left ventricular hypertrophy (n=1) and mild systolic dysfunction of the right ventricle (n=1). All patients were followed up in the outpatient clinic for at least 6 months. Eighty percent of the children with and without abnormalities.

CONCLUSION. A 15% prevalence of ventricular dysrhythmias and mild dysfunction of the right ventricle is found in 90 SS survivors, 1-10 years after admission. Since ventricular rhythm disturbances could lead to sudden cardiac death and the significance of dysfunction of the right ventricle in developing children is not known, long term follow-up of survivors of SS in childhood is warranted.

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0713
INCIDENCE OF NSTEMI VERSUS STEMI IN PATIENTS WITH HEMORRHAGE AND/OR ANEMIA

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INTRODUCTION. Hemorrhage and anemia cause hyperperfusion and decreased oxygenation of body organs including heart. There is evidence that anemia is a condition recognized as an independent risk for the progression of cardiovascular disease and for mortality after acute myocardial infarction. We supposed that in nonelective group of patients with hemorrhage and/or anemia we could expected more often NSTEMI than STEMI.

METHODS. We retrospectively analyzed data of 34 patients with hemorrhage and subsequently developed acute myocardial infarction or with severe anemia and concomitant myocardial infarction without signs or data of recent hemorrhage treated in the Intensive Care Unit, Department of Internal Medicine, Dubrava University Hospital from January 2000 to May 2005.

RESULTS. All included were Caucasian, 19 males (55.9%) and 15 (44.1%) females. Age of patients were between 51 and 94 years (median 73.21 years, SD 11.84). In 25 pts (78.5%) we verified a bleeding from upper part and in 4 (11.8%) from lower part of gastrointestinal tract, two pts (5.9%) had a chronic anemia, in one (2.9%) we found hematuria and one had hemorrhagic pancreatic pseudocyst. The lowest haemoglobin concentration ranged from 36 to 110 g/l (median 69.53 g/l, SD 19.7). Mean APACHE II score was 14.09±6.708 (minimal 4, maximal 36). NSTEMI developed in 31 pts (91%) while STEMI was present in 3 pts (8.8%). Among NSTEMI patients, 27 (79.4%) had electrocardiographic (ECG) signs of ischemia, 3 (8.8%) had left bundle branch block and one patient (2.9%) with chest pain without ECG changes had increased specific markers of cardiac injury (CK, CK-MB, troponin I). Seven patients, all with NSTEMI, died (20.6%).

CONCLUSION. Anemia can worsening oxygen supply of myocardial areas with previously insufficient blood supply causing critical ischemia and in severe cases tissue death necrosis or infarction of subendocardium or diffuse. Today confirmation of myocardial damage can be easily obtained by definite marker like troponin I, which are highly specific and sensitive. In addition we can expected ECG changes related NSTEMI with increasing frequency in anemia and hemorrhage.

REFERENCE(S). 1) Capell M.S. Gastrointestinal bleeding associated with myocardial infarction. Gastroenterol Clin North Am. 2000;29:423-444.

0714
THE EPIDEMIOLOGY AND A SIX-YEAR EXPERIENCE IN TREATMENT OF PULMONARY EMBOLISM IN UNIVERSITY HOSPITAL

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INTRODUCTION. Pulmonary embolism is a common cardiovascular illness with an incidence of 1-2% in general population. Patients present a wide spectrum of illness that ranges from mild to severe, even death. The aim of the study was to evaluate the demographic data as well as clinical characteristics of patients treated for pulmonary embolism in Medical intensive care unit (ICU) at the Sestre Milosrdnice University Hospital. Also to assess the impact of several risk factors and accompanying damage of tissue supply.

METHODS. This was a retrospective analysis of 214 hospital records, of patients admitted to the ICU under suspicion of pulmonary embolism for the last six years. The diagnosis was based on clinical examination, electrocardiographic and chest X-ray findings, D-dimmers testing and finally confirmed by either high probability ventilation/perfusion (V/Q) lung scan or multidetector computed tomodraphy (MDCT).

RESULTS. The study included 214 patients, mean age 69.3 years (median 73, range 21-91 years), predominantly male (70.3%). One hundred and fourteen (69.1%) patients were discharged from the ICU (ICU survivors) and 51 (30.9%) died (ICU non-survivors). Common symptom was dyspnea (97.0%), the most common sign tachypnea (69.6%). Obesity was found in 31.5% of patients (mass index (BMI) >25 kg/m2) and this was predominating risk factor recorded. Duplex scan sonography of the lower extremities revealed deep vein thrombosis as another risk factor for pulmonary embolism in 39.4% of patients. Pulmonary embolism was confirmed by the aforementioned techniques in 71.5%. Co-morbidity included hypertension and chronic heart failure in 96 and 47 patients, respectively. According to clinical presentation and echocardiographic signs of right ventricular overload (1), pulmonary embolism was regarded as massive in 63 (38.2%), submassive in 23 (13.9%) and small in 74 patients (44.9%). Mean length of stay was 5.7 days for the ICU, but in total 14.8 days. ICU mortality was 26.7% and in-hospital mortality 30.9%.

CONCLUSION. Pulmonary embolism remains an important clinical problem with high mortality rate. Data from this study provide highlights on this problem and may help in raising awareness of the importance of identifying patients at high-risk for developing pulmonary embolism or an unfavorable outcome.

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0715
PLASMA CONCENTRATION OF ADIPONECTIN PREDICTS SEVERITY OF CORONARY ARTERY DISEASE

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INTRODUCTION. Adiponectin is an adipocyte derived plasma protein that shows a number of antiatherogenic properties. It is abundantly present in the circulation and also accumulates in the injured arteries. This study was designed to determine whether a decreased plasma adiponectin level is associated with the extent of atherosclerosis in patients with coronary artery disease (CAD).

METHODS. Plasma concentrations of adiponectin were measured in 97 patients with CAD and 22 healthy control participants. All patients underwent coronary angiography for clinical purposes. Patients were divided into two groups according to the number 50% diameter stenosis by quantitative angiography ≥ of coronary plaques causing 3 plaques (n = 47) and group 2; ≤(QCA): group 1; ≥ 3 plaques (n=50) with a particular focus on the relation between plasma adiponectin concentrations and the presence or absence of cine-angiographic evidence of coronary calcification (a marker of heavy atherosclerotic burden).

RESULTS. Plasma concentrations of adiponectin in patients with CAD were significantly 2.4 ug/ml, p=0.03). Patients with 3 plaques > 7.3 ± lower than in control group (4.6 group 2 had a significantly lower plasma adiponectin level than patients in 4.5 ug/ml, p=0.05). Patients with calcified lesions. 2.7 vs 5.7 group 1 (3.6 (n = 33) had also a significant lower level of plasma adiponectin than patients ≥ 1.9 vs 5.2 ± with no evidence of cine-angiographic calcification (n=64) 3.4 ± u g/ml p=0.05). On the other hand, plasma adiponectin level showed a significant negative correlation with body mass index (BMI) (r=-0.313, p=0.015). Multiple regression analysis showed that plasma adiponectin concentrations correlated independently with increased number of coronary plaques > 3 (p=0.05).

CONCLUSION. The present study showed that decreased plasma adiponectin concentrations can predict severity of CAD and may be related to increased atherosclerotic burden.

REFERENCE(S). 1) Capell M.S, Gastrointestinal bleeding associated with myocardial infarction. Gastroenterol Clin North Am.2000;29:423-444.

0716
IMPROVED POSTOPERATIVE OXIDATIVE METABOLISM OF VIALBLE MYOCARDIUM AFTER CORONARY BYPASS GRAFTING

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INTRODUCTION. The aim of this study was to assess the effect of surgical coronary revascularisation and associated functional recovery on myocardial metabolism in patients after myocardial infarction. The microdialysis technique was used to estimate changes in interstitial metabolites.

METHODS. Microdialysis catheters were either implanted into an akinetic area of the left ventricle of myocardial infarction or into a segment with mild / moderate hypokinesia and less than 50% of transmural hyperenhancement (viable group, n = 10). Myocardial glucose, lactate and pyruvate were analyzed before, during and 24 hours after CABG. The myocardial glucose-lactate-ratio (GLR) and myocardial/systemic glucose ratio (m/s) - as markers of nutritional disorder - were calculated. Myocardial ethanol washout from the microdialysis probe was also measured as a sign recovered of local blood flow.

RESULTS. Improvement of wall motion was found in all viable compared to the scar segments. After surgical revascularisation recovering of the myocardial flow in these areas resulted in increased glucose delivery to the tissue with a significant better m/s-glucose-ratio. The myocardial GLR and pyruvate levels showed also significant higher values. Restored myocardial blood flow was detected by using the ethanol washout technique.

CONCLUSION. Our results indicate that revascularisation of chronic, ischemic myocardium with dyshkinetic segments resulted partly in an early functional improvement with normalized wall motion. The metabolism of those segments is characterized by a significant increased tissue flow, increased utilization of glucose and a better oxidative nutrition.

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**0719**

**EARLY LACTATE CLEARANCE IS ASSOCIATED WITH IMPROVED OUTCOME IN POST-CARDIAC ARREST PATIENTS**

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**INTRODUCTION.** Early, high lactate clearance is associated with improved mortality in severe sepsis and septic shock. We investigated whether early, high lactate clearance was associated with reduced mortality in post-cardiac arrest patients.

**METHODS.** We performed a retrospective analysis of post-cardiac arrest patients in an urban emergency department. Inclusion criteria included pre-hospital cardiac arrest patients, and exclusion criteria included traumatic arrest or arrest in the presence of healthcare personnel. The primary endpoint was survival to 24 hours, and the secondary endpoint was survival to hospital discharge. Lactate clearance, defined as the percentage change in lactate acid levels over a given period of time, was tracked at 6 and 12 hours. A multivariable regression model and Student’s t-test were used for data analysis.

**RESULTS.** A total of 79 patients were analyzed with a mean age of 64.1±17 years and mean APACHE II score of 37.7±5. Of the 79 patients, 27 (34%) died within 24 hours and 66 (84%) died during the hospital course. The mean initial lactate levels were similar among 24-hour and overall survivors and non-survivors. However, lactate clearance at both 6 and 12 hours was significantly higher for both 24-hour and overall in-hospital survival (Table 1, p<0.05). A multivariable analysis inclusive of APACHE II score, lactate clearance, initial heart rhythm, and downtime was performed for the primary endpoint of 24-hour mortality. High lactate clearance at 12 hours remained predictive of survival (p<0.05), whereas all other variables were no longer statistically significant.

**CONCLUSION.** Early, high lactate clearance is associated with early and overall in-hospital mortality in post-cardiac arrest patients. These findings suggest that post-arrest tissue hypoperfusion plays an important role in mortality.

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**0720**

**EPINEPHRINE – BUT NOT NOREPINEPHRINE – INDUCES CHANGES IN HAEMODYNAMIC ENTROPY**

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**INTRODUCTION.** Cardiovascular dynamics in health and disease appear to reflect complex regulatory mechanisms [1], which can be described by analysing haemodynamic entropy. Decreases in entropy have been associated with various critical pathologies, e.g. sepsis [2]. We studied the impact of graded catecholamine infusions on haemodynamic entropy.

**METHODS.** Six anaesthetized and mechanically ventilated fowshasts (propofol 20 mg/kg/h, FIO2 0.3, eC'TO2 35 mmHg) receiving increasing doses (0, 0.05, 0.1 and 0.2 μg/kg/min) of either epinephrine (EPI) or norepinephrine (NOR). Systolic arterial pressure (SAP) and heart rate (HR) time series (720 cardiac cycles) were analysed using a multiscale entropy algorithm as previously described (vector length 1 to 2, tolerance 0.15, scale 1 to 6) [3]. Statistics: Means ± SEM, ANOVA, p<0.05.

**RESULTS.** EPI decreased entropy of HR from 1.6±0.2 to 0.7±0.1 at 0.05 μg/kg/min, whereas NOR did not influence entropy of HR. In contrast, EPI increased SAP entropy dose dependent whereas NOR did not (significant intergroup differences at 0.1 and 0.2 μg/kg-1 min-1).

**CONCLUSION.** Catecholamines have complex influence on haemodynamic entropy. These effects are dose and substance dependent with minor influence of NOR, and marked effects of EPI. Thus, in patients, catecholamine therapy may be one factor differentially influencing haemodynamic entropy.

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**0717**

**IABP TRENDS IN ROUTINE CARDIOLOGY: AN 11 YEAR, 686 PATIENT AUSTRALIAN DATASET**

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**INTRODUCTION.** Intraaortic balloon counterpulsation (IABP) is an established treatment for the support of a failing heart. A reduction in complications and mortality rates over recent decades has seen an increased use of IABP with current studies increasingly examining the changing trends in its use. The aims of this study were: to describe indications for IABP use and identify the impact these have on outcomes at an Australian cardiothoracic tertiary referral hospital; and compare these Australian aspects of practice and outcomes with those in a large multinational IABP data registry to benchmark practice.

**METHODS.** The Prince Charles Hospital (TPCH) in Brisbane was the Australian cardiothoracic tertiary referral hospital where data was gathered for comparison against The Benchmark Counterpulsation Outcomes Registry. Data were collected between 1994 and 2000 and retrospectively reviewed. A multivariable analysis inclusive of APACHE II score, lactate clearance, initial heart rhythm, and downtime was performed for the primary endpoint of 24-hour mortality. High lactate clearance at 12 hours remained predictive of survival (p<0.05), whereas all other variables were no longer statistically significant.

**CONCLUSION.** Early, high lactate clearance is associated with early and overall in-hospital mortality in post-cardiac arrest patients. These findings suggest that post-arrest tissue hypoperfusion plays an important role in mortality.

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**0718**

**CIRCULATING THROMBOMODULIN IN ISCHEMIC HEART DISEASE**

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**INTRODUCTION.** Abnormal endothelial physiology has been implicated both in early atherosgeneisis & later, in the control of dynamic plaque behavior. Substances released by the endothelium include prostacyclin, NO, endothelin, VWF & thrombomodulin (TM) etc. TM is an integral membrane glycoprotein that can change the function of thrombin to an anticoagulant through activation of the protein C which, in the presence of protein S inactivates FIIa & FVIIIa & thereby inhibits further formation of thrombin. Soluble TM is thought to indicate endothelial-cell damage.

**METHODS.** To assess the diagnostic role of circulating TM as a marker of the extent & severity of coronary arterial atherosclerosis we studied. We studied 150 pts with ischemic heart disease (ISH, 118 M,32F with a mean age of 53.4 ± 8.3 ranging from 30yrs to 80 yrs), together with 20 non ischemic pts who were catheterized prior to valve replacement (13M,7F a mean age of58.4±4.5) serving as controls. Of the 150 ischemic pts,77 had anginal pain, and 7 had acute MI. Following clinical evaluation, 12 leads ECG & routine lab work, all pts were subjected to & coronary arteriography to assess the extent & severity of the stenotic lesions using Gensini scoring system. All pts had TM levels, measured in arterial samples withdrawn from coronary artery during catheter procedure using the enzyme immuno assay ELISA.

**RESULTS.** Compared to the control subjects, the ischemic pts exhibited significantly higher levels of serum TM (142±s, 54±s vs 2.8±s, 0.8, p<0.0000), with progressively higher levels of TM from AP Gp to AMI Gp (45.7±s vs 39.6±s, p= 0.00001). Serum TM correlated significantly with the severity of coronary artery pathology expressed as Gensini score with p<0.0000 for AP Gp & p<0.0000 for AMI group. Again, both groups exhibited significant correlation between plasma TM & the number of diseased vessels with p <0.0000 for both groups.

**CONCLUSION.** Thrombomodulin, an endothelial glycoprotein resulting from the damage to vascular endothelium by the atheromatous pro cess, showed significant correlation with the extent & severity of CAD (expressed by Gensini score system). The high er TM level in AMI Gp compared to AP Gp points to the more significant endothelial damage in the compared to the latter that stresses the importance of plasma TM as a molecular marker of endothelial dysfunction in acute isch eimic syndromes.
0721
VENTRICULAR ARRHYTHMIA DURING WEANING FROM MECHANICAL VENTILATION

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INTRODUCTION. Weaning from mechanical ventilation (MV) can be associated with cardiac arrhythmias. Few studies are comparing their occurrence during weaning with pressure support ventilation (PSV) and T-tube (TT) in patients with and without heart disease. The objective this study is to evaluate the occurrence of arrhythmias in these groups of patients during PSV and TT.

METHODS. Patients without (group 1) and with (group 2) heart disease, under mechanical ventilation for at least 48 hours, were observed during 30 minutes of PSV or TT, in a random order. Variables analyzed were: age, APM/CH, length of stay in ICU (LOS), cardiorespiratory variables including respiratory rate, rapid shallow breathing index (f/VT), maximum inspiratory (PImax) and expiratory (PEmax) pressure. Continuous ECG was recorded by Holter method. For statistical analyzes repeated measures ANOVA or ANOVA on ranks were used.

RESULTS. Twenty-two patients were studied, 13 in group 1 and 9 in group 2. Comparisons between groups 1 and 2 showed: no differences were found in APACHE (23 ± 4; 23 ± 8; NS), PImax (32 ± 19; 28 ± 12 cmH2O, NS) and PEmax (24 ± 10; 20 ± 7 cmH2O, NS); f/VT was greater in cardiac patients during TT (PSV: 28 ± 25 versus 41 ± 18; TT: 42 ± 18 versus 57 ± 20, ANOVA: p < 0.05), as well as respiratory rate (PSV 21 ± 6 versus 20 ± 5; TT: 22 ± 6 versus 25 ± 6, ANOVA: p < 0.05). The occurrence of ventricular arrhythmias (median and interquartile ranges), respectively in PSV and TT were in group 1: (0 - 13) versus (0 - 5.5) and in group 2: (3.0 - 8.5) versus (21 - 4 - 61), ANOVA: p < 0.05.

CONCLUSION. During weaning from MV cardiac patients showed higher respiratory rate and higher f/VT during TT when compared with PSV, as well as a greater occurrence of ventricular arrhythmias in both methods, but principally during TT, when compared with non-cardiac patients.

0722
HEMODYNAMIC EFFECTS OF LEVOSIMENDAN IN PATIENTS WITH CARDIAC SHOCK REFRACTORY TO CATECHOLAMINES

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INTRODUCTION. Levosimendan is a novel inotrope that has proved to be effective in treating advanced congestive heart failure. The aim of this study was to assess hemodynamic effects of Levisomendan in patients with cardiac shock refractory to catecholamines.

METHODS. Nine patients (53 ± 19 years, 5 male/4 female) with persisting cardiogenic shock following acute myocardial infarction (5), peripartum cardiomyopathy (2) or dilated cardiomyopathy (2) were candidates to levosimendan infusion. In all patients, high dose of isotropic treatment failed to improve hemodynamic parameters. Levosimendan was introduced at a loading dose of 12 μg/kg followed by a continuous infusion of 0.1 μg/kg/min for 24 hours. Hemodynamic measurements were performed using a Swan-Ganz thermomediator catheter at baseline and at 30, 90 minutes, 6, 12, 24 and 48 hours after the starting of levosimendan. Transoesophageal echocardiography was performed at baseline, 12, 24 hours after that and 15 days in survivors.

RESULTS. Levosimendan induced a significant decline of pulmonary capillary wedge pressure and systemic vascular resistances, followed by a significant increase in cardiac index (CI) and mixed venous oxygen saturation. Changes in heart rate and mean arterial blood pressure were not significant. Left ventricular ejection fraction was improved from 24% to 40% within 48 hours.

CONCLUSION. This study showed that the use of levosimendan in cardiogenic shock, improved hemodynamics and left ventricular performance. Additional clinical trials are needed to safely broaden its indications in cardiogenic shock.

0723
WEANING-INDUCED PULMONARY EDEMA IS DIAGNOSED BY INCREASED PLASMA PROTEIN CONCENTRATION

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INTRODUCTION. The clinical and radiological signs of cardiogenic pulmonary edema (PE) induced by weaning from the mechanical ventilation are not specific and its diagnosis is certainty is based on the measurement of PAOP. During weaning-induced PE, a low-protein concentrated fluid is transferred toward the alveolar/interstitial space, inducing a relative concentration of the plasma that could result in a significant increase of the plasma protein concentration. We investigated whether the increase in plasma protein concentration during a weaning test could detect reliably weaning-induced PE.

METHODS. In 29 patients who failed at two consecutive weaning tests on a T tube, a pulmonary artery catheter was inserted. A weaning PE was diagnosed if occurred during a subsequent test (1 tachypnea ≥35/min and/or tachycardia ≥120/min and/or a fall in arterial pulse oximetry <90% associated with (2) an increase in PAOP above 18mmHg). The plasma protein concentration was measured before and at the end of the weaning period.

RESULTS. A weaning PE was observed at the end of the weaning test in 23 patients (increase in PAOP from 13±3 to 29±6mmHg, p<0.05). In these patients, the protein concentration increased simultaneously by 9±5% from 58±8g/L. In the patients who did not exhibit PE, protein concentration did not change significantly during the weaning test (3±2% increase from 61±5g/L). More importantly, an increase in protein concentration above 5% during the weaning test predicted the occurrence of weaning PE with a sensitivity of 82% and a specificity of 100%.

CONCLUSION. Weaning-induced PE can be reliably detected by an increase in plasma protein concentration during a weaning trial.

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0724
SERUM CHOLINESTERASE ACTIVITY REFLECTS MORTALITY IN SURGICAL ICU PATIENTS EARLY

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INTRODUCTION. Serum cholinesterase activity (CHE) was found to be a sensitive indicator of morbidity and mortality in burn patients, where it was significantly lower in non-survivors 24 hours after admission (1). As there are no data available on the prognostic value of CHE activity in a large medical-surgical intensive care population, we investigated its prognostic usefulness in an according population.

METHODS. All consecutive adult patients who needed at least 4 days of ICU treatment admitted to two mixed surgical ICU’s during 2004/5 were enrolled. CHE was determined immediately after admission and thereafter daily until discharge or death. CHE of survivors and non-survivors at day one to four, first and minimum values were compared using ANOVA for repeated measurements.

RESULTS. 441 patients were eligible for the study. The first value of cholinesterase activity was already significantly lower in non-survivors. This difference remained significant on days one to four. The decrease in serum cholinesterase activity versus day 1 was significant in both groups. The minimum values reached during the ICU stay were lower in non-survivors (Table).

| CHE (kl/l) activity in survivors and non-survivors |
|--------------------------------------------------|
| First measurement | Day 1 | Day 2 | Day 3 | Day 4 | Lowest value |
| Survivors n=367 | 3.9±1.7 | 3.7±1.6 | 3.5±1.4 | 3.3±1.2 | 3.2±1.2* | 2.7±1.2 |
| Non-survivors n=74 | 3.2±1.8 | 3.2±1.7 | 3.0±1.5 | 2.9±1.3 | 2.9±1.4** | 1.8±1 |
| p-value | 0.0004 | 0.0001 | 0.026 | 0.003 | 0.046 | <0.0001 |

* p<0.0001 versus day 1; **p<0.05 versus day 1

CONCLUSION. CHE activity is lower in non-survivors compared to survivors from the first measurement on and is thereby a very early indicator of increased mortality.

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0726
CULTURAL DIVERGENCE IN PROGNOSTIC INSTRUMENTS: APACHE II AND SOFA SCORING SYSTEMS IN CRITICALLY ILL PATIENTS

INTRODUCTION. APACHE II (acute physiology and chronic health evaluation) and SOFA (sequential organ failure assessment) scores are used as predictors of length of stay (LOS) in various intensive care units (ICUs). We compared two surgical ICUs (general surgical vs cardio-surgical) to find out usefulness of these scoring systems for predicting LOS in surgical ICUs. We hypothesized that significance of scoring for predicting LOS is greater in specialized surgical ICUs than in general surgical ICUs.

METHODS. We scored patients in our general surgical ICU (n = 328) and cardio-surgical ICU (n = 158) consecutively on admission (APACHE II-1st day; SOFA-1st day) and on third day of stay (APACHE II-3rd day; SOFA-3rd day) in a 4 month period. There was no significant difference between the study groups according to gender (p=0.949), age (p=0.240), type of admission (elective/acute/grey surgery) (p=0.506), type of discharge (alive/dead) (p=0.847), LOS (p=0.998), APACHE II-1st day (p=0.957), SOFA-1st day (p=0.624), APACHE II-3rd day (p=1.000), SOFA-3rd day (p=0.942).

RESULTS. LOS and APACHE II / SOFA scores were significantly correlated both on admission and on third day of stay in general surgical ICU (APACHE II-1st day r = 0.299; SOFA-1st day r = 0.308; APACHE II-3rd day r = 0.278; SOFA-3rd day r = 0.258) and cardio-surgical ICU (APACHE II-1st day r = 0.092), while SOFA on admission and APACHE II and SOFA on third day were significantly correlated (SOFA-1st day r = 0.258; APACHE II-3rd day r = 0.176; SOFA-3rd day r = 0.179).

CONCLUSION. Usefulness of scoring for predicting LOS in ICU varies between different surgical ICUs. Contrary to our hypothesis, scoring has greater value for predicting LOS in general surgical ICU. APACHE II score on admission has no value for predicting LOS in cardiovascular ICU.

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0729

PERFORMANCE OF APACHE III IN INTENSIVE CARE UNIT PATIENTS AFTER MAJOR VASCULAR SURGERY

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INTRODUCTION. Only 3.6% of patients in the original Acute Physiology and Chronic Health Evaluation (APACHE) III cohort underwent surgery for repair of abdominopelvic aneurysm or aortic catastrophe. We examined the performance of APACHE III in a large major vascular surgery population.

METHODS. Retrospective review of 1416 patients admitted to our surgery intensive care unit (ICU) after major vascular surgery between October 1994 and March 2006. Major vascular surgery included elective and emergent abdominal and thoracoabdominal aneurysm repair, surgically managed aortic dissections and aorto-iliac and aorto-femoral bypass procedures. Patients requiring full cardiopulmonary bypass and those without research consent excluded. Only first ICU admission included for each patient. Demographics, ICU admission day acute physiology (APS) and APACHE III score, actual and predicted mortality and lengths of stay collected. Calibration of APACHE III assessed by Hosmer-Lemeshow statistic and discrimination by area under receiver operating characteristic curve (AUC).

RESULTS. There were 3548 ICU admissions during study period. Mean age was 70.5 ± (± standard deviation 9.6) years. Mean APS and APACHE III score on day of ICU admission were 31.0 (±17.5) and 45.1 (±18.8), respectively. Mean predicted ICU and hospital mortality rates were 3.2% (±7.8) and 5.0% (±9.5). Median (and interquartile range) predicted ICU and hospital lengths of stay were 4.3 (3.6-5.1) and 10.4 (9.1-16.8) days, respectively. Actual median lengths of ICU and hospital stay were 1.9 (1.1-3.6) and 9.0 (7.0-13.0) days. Observed ICU and hospital mortality rates were 2.4% (75 of 3148 patients) and 3.7% (116 of 3148 patients), respectively. Although 76.1% of patients were male, there were no significant differences in gender between survivors to hospital discharge and non-survivors. There were significant differences (p<0.0001 for all) in mean age, acute physiology score, APACHE III score and predicted ICU and hospital mortality rate between survivors and non-survivors. In predicting mortality, AUC of APACHE III prediction was 0.821 (95% CI 0.781-0.862) and Hosmer-Lemeshow statistic was 6.518 with p value of 0.589.

CONCLUSION. In patients admitted to ICU after major vascular surgery, APACHE III discriminates well between survivors and non-survivors. Calibration of the model in this group is good.

0730

DELTA SOFA AS A DISCRIMINATORY POWER IN PREDICTING OUTCOME IN CRITICALLY ILL PATIENTS

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INTRODUCTION. The sequential organ failure assessment (SOFA) score measures organ dysfunction and also has a strong correlation with patient outcome. Delta SOFA has been used as a tool to assess the degree of dysfunction/failure already present on ICU admission, the degree of dysfunction/failure that appears during the ICU stay and the cumulative insult suffered by the patient. The aim of the study was to evaluate the discriminatory power of delta SOFA on patient outcome after admission to the ICU.

METHODS. Prospective observational cohort study, conducted during a period of two years (2004-2006) in ICU at a university hospital. We studied all patients who stayed more than 5 days in ICU. Delta SOFA score on day 1 was defined as the difference between day 2 SOFA score and admission, delta SOFA score on day 2 was defined as the difference between day 3 SOFA score and admission, and so on. The discriminative power of delta SOFA score for the prediction probability of hospital mortality was tested by the area under the receiver operating characteristic (ROC) curve. The area under the ROC curve summarizes the relationship between 1 minus the sensitivity (number of true positives) and specificity (number of false positives) for all the possible values of the organ dysfunction scores and estimates the discriminatory power of the model to assign a higher risk of death to patients who die. P value < 0.05 was considered significant. Statistical analysis was performed using the SPSS 11.0 statistical package.

RESULTS. Among 305 patients admitted to the ICU (mean age 57.3 years) the severity scores at admission were mean SAPS II score 36.3 points and mean SOFA score 6.7 points. The mean length of stay in the ICU was 14.2 (±1.87) days, in the hospital 40 (±3-475) days. The overall mortality in the ICU was 30.8% with a hospital mortality of 41.3%. The outcome measure used was survival status at discharge from the hospital. Compared with the other delta SOFA, delta SOFA on day 5, presented the largest area under the ROC curve (95% CI 0.565-0.701, SE 0.035, p=0.0001), followed by delta SOFA 3 (95% CI 0.515-0.669, SE 0.037, p=0.002) and delta SOFA 2 (95% CI 0.515-0.652, SE 0.035, p=0.002).

CONCLUSION. Delta SOFA score 4 can identify better than the others delta SOFA score the critical point at which patients exhibits the highest degree of organ dysfunction during the ICU stay. This suggest that delta SOFA score 4 is effective in predicting hospital outcome.

0731

OSMOLALITY FOR OUTCOME PROGNOSIS

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INTRODUCTION. In the current study we validated the predictive value of osmolality, laboratory parameters as well as APACHE II score for hospital outcome. Furthermore, validation of non-linear and logistic regression models for hospital mortality derived from the training data was intended.

METHODS. Two retrospective observational clinical studies were conducted in a 15-bed mixed ICU in a university hospital each with a length of three years. The training data (TD) involved 931 consecutive patients with an ICU stay >24hrs, whereas the validation data (VD) included 1031 patients. Primary outcome parameter was hospital mortality. Receiver Operating Characteristic (ROC) analyses, logistic models as well as were calculated to assess the predictive value of parameters. To test prediction models from the TD goodness-of-fit (GOF) statistics and quality of discrimination were determined.

RESULTS. Hospital mortality was 25.0% (TD) and 22.9% (VD). APACHE II score predicted best in both data sets (AUC 0.784 and 0.749). Serum osmolality revealed best prognosis among clinical parameters (AUC 0.732 and 0.687). However, restricted to long-term patients with ICU stay >5 days, serum osmolality exceeds APACHE II in outcome prediction. Non-linear models with serum osmolality and APACHE II predicting hospital outcome in the training data calibrated well for the validation data (GOF, p=0.97 and p=0.89, respectively). A multivariate logistic model derived from the training data discriminated well in the validation data (AUC 0.697) with sensitivity of 61% and specificity of 62%.

CONCLUSION. Here, we report that osmolality is useful in outcome prediction. Though predictive value for osmolality was less than in the training data, the association between osmolality and hospital mortality could be confirmed. Moreover, prognostic regression models predicting hospital outcome derived from the training data could be validated.

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0732

COULD WE PREDICT POST-OPERATIVE HOSPITALISATION LENGTH IN CARDIAC SURGICAL PATIENTS?

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INTRODUCTION. Identifying factors that affect cardiac surgical patient hospitalization length (HL) could improve their healthcare management and costs.

METHODS. We retrospectively analysed data of all patients (pts) undergoing cardiac surgery between January 1998 and June 2005, and discharged from our ICU by 24 hours from surgery. We collected: (i) demographics and univariate and binary variables [cardiopulmonary by-pass (CPB) and aortic cross clamp (ACC) times] (ii) duration of mechanical ventilation, use and type of inotropes. One-Way ANOVA was used for continuous variables whereas, differences in proportions were compared using Chi-squared test. A binary Logistic Regression Model was used to estimate the effect of each considered risk factor on discharge from cardiac surgery to rehabilitative ward, considered as a dichotomous outcome (yes = early < or = 7 days / no = late > 7 days). Statistical analyses were performed using SPSS Software. P values less than 0.05 were considered significant.

RESULTS. A total of 1488 pts [median (IQR) age 65 (56-72) ys, 71% males] were discharged from ICU by 24 hours from surgery. Most 67% of them underwent coronary artery by-pass grafting (CABG), while, 28% valve procedures (VP), with a median (IQR) HL of 7 (7-8). The b-LRM was performed, considering discharging from surgical to rehabilitative ward as the categorical dichotomous dependent variable (see methods) and as independent dichotomous variables (i) age (>or< 65 yrs), gender, diabetes, hypertension, arteriopathy, renal failure, COPD (all yes/no), (ii) NYHA and CCS score (>or< 2), (iii) mechanical ventilation duration (>or< 480 min), (iv) aortic cross clamp (ACC) (>or< 60 min) and transfusion (plasma or red blood cells) (yes/no), (v) inotropic (yes/no) (vi) mechanical ventilation duration (>or< 48). NLRM showed predictors of longer postoperative hospitalization are (i) mechanical ventilation duration > 8 hrs (p =0.0000, O.R. = 0.615 95% CI 0.488-0.775) (ii) undergoing both a mitral (p = 0.046, O.R. = 0.671 95% CI 0.453-0.993) and an aortic (p = 0.038, O.R. = 0.624 95% CI 0.40-0.975).

CONCLUSION. The model established that an early weaning from mechanical ventilation is the strongest predictor of a shorter hospitalization after ICU care, together with experiencing a coronary artery disease without a valve pathology.
DETERMINANTS OF OUTCOME IN CRITICALLY ILL PATIENTS
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INTRODUCTION. While most studies focus on laboratory and clinical research, little is known on the causes of death and risk factors for death in critically ill patients. This study was performed to identify mortality rates, causes of death, and risk factors for death in a mixed critically ill patient population.

METHODS. During a seven years period, all critically ill patients admitted to an adult intensive care unit (ICU) were prospectively evaluated. Data documentation included demographic, clinical and laboratory parameters before ICU admission and during the ICU stay. After patient discharge from the ICU, need for re-admission, hospital and one year mortality, as well as causes of in-hospital and one year mortality were documented. The study endpoints were to evaluate mortality rates and causes of death in the ICU, the hospital, and one year after ICU admission, and define risk factors for death during these periods.

RESULTS. Of 405 critically ill patients, 3700 patients (age, 59.2±19.3 years; SAPS II, 37.6±16 pts; ICU-length of stay, 8±9.8 days) were eligible for study entry. ICU mortality was 9.5% (predicted according to SAPS II, 19.7%). Acute, refractory multiple organ dysfunction syndrome was the most frequent cause of death (47%), while central nervous system (RR 16.07, CI95%: 0.3-31.4, p<0.001) and cardiovascular failure (RR 11.83, CI95%: 5.2-27.1, p<0.001) were the two most important risk factors for death. ICU survivors had a significantly shorter ICU stay than nonsurvivors (7.6±9.5 vs. 11.7±11.5 days, p<0.001). In-hospital mortality after discharge from the ICU was 4.3% (overall, 13.5%). After discharge from the hospital, mortality within one year after ICU admission was 8.9% (overall, 21.2%). Malignant tumour disease was the most frequent cause of death in the hospital after ICU discharge and within one year after ICU admission. The number of ICU admissions was the most important risk factor for death one year (RR 11.84, CI95%: 4.3-32.5, p<0.001).

CONCLUSION. With current standards in critical care, ICU, in-hospital, and one year mortality of critically ill patients is lower than predicted by the SAPS II. Acute or chronic multiple organ dysfunction syndrome prevails over single organ failures or unexpected cardiac arrest as causes of death.

INTENSIVE CARE PATIENTS REQUIRE MORE THAN AGE TO INCREASE MORTALITY
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INTRODUCTION. A number of questions relating to age and intensive care mortality remain incompletely answered. Is there a threshold of age associated with a lower survival? Is 80 year an upper limit to be taken into account to admit patients on ITU? A number of investigators have recently examined the effect on the outcomes of older patient (2). Aim: To determine the effect of age as a factor that influence mortality on patients who are admitted to the mixed Intensive Therapy Unit.

METHODS. We did a prospective observational research study and one hundred and sixteen critical ill patients admitted to a ITU. Enrolment criteria. Any patient older than 12 y. Severity at admission was estimated using the APACHE III score. Age was split on 5 groups: older than 30 y, 40 y, 50 y, 60 y, and older than 80 y. Free on any other risk factor of mortality and non-other classification according to type of previous medical problem was taken into account. A descriptive analysis was performed, data are presented as mean ± SD, and student t–test were used to compare the difference of age and mortality among each group. For mortality prediction the ROC analysis tested the best threshold level of the age variable. The statistical analysis was carried out with the SPSS 10 package, and p<0.05 was considered statistically significant.

RESULTS. Death was the outcome variable that was studied. Of 516 patients, 39.3% were male and 60.7% were female. Their average age was 52.4±20.5 y. APACHE III score 12.8±7.3. The overall mortality rate was 9.6%. Mortality and significance are showed on table 1. ROC regarding mortality were plotted for all age groups. The highest AUC values were found for age area under 47 year (AUC 0.64, 95% CI 0.59-0.68), p=0.0013, sensitivity 82%, specificity 42.2%, +PV 17.7 and -PV 95.8.

TABLE 1. Age difference for each group. Age difference for each group.

| Age Group | Death Yes | Death No |
|-----------|-----------|----------|
| Older than 80 | 85.7±3.9 | 85.3±4.9 |
| 70 | 78.4±6.1 | 78.6±5.8 |
| 60 | 74.3±8.1 | 73.6±7.9 |
| 50 | 71.2±10 | 67.8±10.5 |
| 40 | 66.3±13 | 63.3±13.1 |
| 30 | 64.2±15 | 59.4±15.9 |

CONCLUSION. Results no demonstrated a significant dominance of age factor on the prognosis of patients admitted on our ITU, due to this, no significance was found for the group of patients older than 40 y. “To be young allow be well, but it does not mean that to be older will die easier”. As a result of this, we should expand the analysis of risk factors to mortality for admitted ITU patients based on past medical history (co-morbidities) and physician do not take precarious preliminary decision in front of older patients. Finally, not only age but also co-morbidities must be taken into account on the decision to expend effort to get any benefit.

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LOW PLASMA SELENIUM LEVELS ARE ASSOCIATED WITH POOR OUTCOME IN CRITICALLY ILL SURGICAL PATIENTS
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INTRODUCTION. Selenium plays an important role in body defense mechanisms against acute illness through its known antioxidant and immunologic effects. We investigated the possible relation between plasma selenium levels and outcome in critically ill surgical patients.

METHODS. Fifteen patients were included consecutively in each of four a-priori defined subgroups: ICU controls (no SIRS group); uncomplicated SIRS group, fulfilling SIRS criteria without any accompanying organ failure; and patients with a diagnosis of severe sepsis/septic shock. Plasma selenium was measured and laboratory indices of organ dysfunction/failure, markers of tissue inflammation and infection were measured daily during the ICU stay. Patients were followed up until death or ICU discharge.

RESULTS. A total of 60 patients were included, 47 (78%) of whom were admitted after a cardiac procedure. The median ICU length of stay (LOS) was 4 days (25-75% interquartile range (IQ): 2-8 days) and the overall ICU mortality was 15% (96). Minimum plasma selenium concentration was inversely correlated to the admission APACHE II score (r=−0.56) and SAPS II scores (r=0.54). Non-survivors had significantly lower initial (median: 36.5 (IQ: 33.2-43.9) vs. 48.3 (IQ: 38.9-63.2), µg/L, p=0.41) and minimum plasma selenium concentrations (median: 24.4 (IQ: 12.3-32.9) vs. 42.6 (IQ: 30.1-50.6), µg/L, p=0.01) than survivors. In a ROC analysis for the prediction of ICU mortality, SAPS II score (AUC=0.803, 95% CI: 0.789-0.817, p=0.001) and the minimum plasma selenium level (AUC=0.867, 95% CI: 0.753-0.981, p=0.003) were the strongest predictive factors. A cut-off point for a minimum plasma selenium of 36 µg/L had 89% sensitivity, 71% specificity, 35% positive predictive value and 95% negative predictive value.

CONCLUSION. In critically ill surgical patients, lower plasma selenium levels are associated with increased ICU mortality.

RISK FACTORS AND OUTCOME FOR VALVULAR REOPERATION
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INTRODUCTION. Compared to first heart valves operations, valvular surgery reoperation (redo) carries a higher mortality. This study reports a single center experience in redo valvular surgery, analyses risks factors of peri-operative death, computes a pre-operative score for mortality prediction and compares the performances of that score with Euroscore (1).

METHODS. The data of all consecutive patients who underwent redo valvular surgery in our institution between 1997 and 2005 were retrospectively analysed. Logistic regression was carried out to identify predictive risk factors of death. Multiple logistic regression was used to isolate independent risk factors and compute pre-operative score of mortality prediction. Predictive values of Euroscore were also computed using logistic regression and ROC analysis. Predictive values of our pre-operative score were compared to the performance of Euroscore.

RESULTS. A total of 227 patients were admitted for redo valvular operation. Hospital mortality was 7.4%. Variables linked to mortality (p<0.05 at the single logistic regression) are emergency, NYHA class, number of redo, pre-operative hemoglobin value, urea, creatinine, lactate dehydrogenase (LDH), duration of operation and extra-corporeal circulation, and transusions. Pre-operative independent predictive factors of mortality are NYHA class, LDL, and urea. Preoperative score = 1.37190 UREA + 0.01252 UREA + 0.000175 LDH (area under the ROC curve = 0.88). This score seems to perform better than the Euroscore (area under the ROC curve = 0.60) on our small and homogenous population.

CONCLUSION. In redo valvular operations hospital mortality are highly correlated to a more advanced stage of the cardiac dysfunction independent of the number of previous interventions. A simple pre-operative score of mortality prediction can be computed using NYHA class, preoperative LDH and urea values with good sensitivity and specificity.

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Both groups did not differ with respect to their demographic data except for the rate of admission pH, worst pH and average 24-hour pH were significantly higher in patients who died than in those who survived. We therefore designed a study to compare these three measures of pH and to correlate them with patient mortality.

METHODS. A retrospective audit was carried out on all patients admitted to the ICU between 5th January 2005 and 1st June 2005. Demographic information and outcome data was obtained from the ICNARC database. The ICU Arterial Blood gas analyzer (ABL 700 Series, Radiometer Copenhagen) was used to provide data from which admission pH, worst pH and a time-weighted average 24-hour pH were obtained.

RESULTS. Of the 199 patients in the study 159 survived to ICU discharge. The mean age of patients was 56.9 years, the mean APACHE II score on admission was 18.1. The admission pH, worst pH and average 24-hour pH were significantly greater in ICU survivors than non-survivors (p < 0.001). For admission pH, worst pH and average 24-hour pH odds ratios (OR) were calculated examining the risk of ICU mortality within the normal pH range (pH 7.35 – 7.45).

| pH | OR: Admission pH | OR: Worst pH | OR: Average 24-hour pH |
|----|-----------------|-------------|------------------------|
| pH < 7 | 97.5 | 154 | No survivors |
| pH 7.1 – 7.2 | 24.4 | 58.7 | No survivors |
| pH 7.3 – 7.4 | 8.9 | 6.4 | 43.7 |
| pH 7.4 | 6.4 | 6.8 | 10.4 |
| pH 7.5 | 2.8 | 0.6 | 3.7 |
| pH > 7.5 | 2.7 | 2.7 | 2.5 |

CONCLUSION. The admission pH, worst pH and average 24-hour pH were significantly higher in ICU survivors than non-survivors. For all three parameters the risk of mortality increased with decreasing pH. For a given pH range the odds ratio for risk of mortality is greatest in the average 24-hour pH group and lowest in the admission pH group, suggesting average 24-hour pH is a stronger prognostic indicator than worst pH or admission pH.
0741 CAN BNP LEVELS PREDICT THE HOSPITAL LENGTH OF STAY OF CARDIAC SURGERY PATIENTS?

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INTRODUCTION. BNP has been studied as a promising follow-up marker and risk predictor for cardiac surgery (CS) patients. However, its role in the postoperative (PO) period of CS is still controversial. The objective of this study is to correlate preoperative and PO BNP levels of CS pts with the intensive care unit and total hospital length of stay (ICULOS and THLOS, respectively).

METHODS. Prospective study with a cohort of 83 CS pts selected between August 2003 and September 2005. Their mean age was 67.0±8.55 years, 23 (27.3%) were females, and the mean Euroscore was 4.0±2.60. BNP was quantitatively measured in the preoperative period (BNPpre), and in the first (BNP1) and sixth (BNP6) PO hours by use of immunofluorescence (Biosite Triage BNP Test). Prolonged length of stay was defined as follows: ICULOS > 3 days and THLOS > 7 days. The pts were then divided into 2 groups: ICULOS > 3 days (<45pts) and THLOS > 7 days (>59 pts). The statistical analysis comprised: Kruskal-Wallis test, Spearman rank correlation, logistic regression (LR), and ROC curve.

RESULTS. The mean ICULOS was 4.6±8.1 days (MED=3) and the mean THLOS was 12.9±11.5 days (MED=9). BNPpre and BNP6 correlated with ICULOS > 3 days (p=0.01 and 0.02, respectively). Regarding THLOS > 7 days, a correlation was observed with BNPpre, BNP1 and BNP6 (0.04; 0.02; and 0.002, respectively). After LR of BNPpre with Euroscore for ICULOS > 3 days and THLOS > 7 days, only Euroscore reached significance (p=0.006, OR=1.36, and p=0.02, OR=1.51, respectively). The areas under the ROC curve with ICULOS > 3days and THLOS > 7 days were 0.65 and 0.70, respectively, for BNPpre, and 0.66 and 0.72, respectively, for Euroscore.

CONCLUSION. BNP plays an important role in the PO period of CS pts, because it expresses the pts’ severity and risk, and, therefore, may predict their ICU and hospital length of stay.

0742 PROLONGED HOSPITALIZATION AFTER OPEN HEART SURGERY

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INTRODUCTION. In the present clinical study we intend to investigate the incidence, the causes and the consequences of prolonged hospitalization after open heart surgery.

METHODS. The study population consists of 749 consecutive patients undergoing open heart surgery and develops principally in patients with low cardiac output syndrome postoperatively.

RESULTS. During a 6 months period, 428 patients underwent coronary artery bypass surgery (CABG), 200 patients valve replacement (VR), 110 patients CABG+VR and 11 patients are leading urgently to the operating room for the treatment of acute dissective aneurysm (ADA). Prolonged hospitalization is confirmed in 35 patients (4.67%), 24 men (68.57%) and 11 women (31.43%) who remain in ICU more than 5 days (22.2±7 days) and in hospital more than 8 days (33.12±14days). The main causes related to prolonged ICU and hospital stay are: dysfunction of at least 3 organs (34%), infections (20%), implantation of permanent pacemaker (12%), complications from central nervous system (12%), reexploration for bleeding (4%). Preoperative risk factors are increased mean age (68.36±5.2 years), diabetes mellitus (40%), NYHA III-IV (60%), left ventricular ejection fraction (LVEF)<35% (32%), pulmonary hypertension (32%). The duration of cardiopulmonary bypass is significantly increased (176.43+/-.23.3min.), the same as aortic cross clamp time (121.57+/-.12.2min). In the majority of the patients we certify the low cardiac output syndrome postoperatively (65.6±0.0min/12.56%) with IABP dependency (28%) and need for increased isotropic support (64%). Prolonged mechanical ventilation is also required with a mean duration of 76.61+/-33hours. Finally, we confirmed 7 deaths (20%, 0.93% of the study population), 2 re-admissions (5.71%) and 2 transportations to other hospitals for further treatment (5.71%).

CONCLUSION. Prolonged ICU and hospital stay is an enough frequent concern (incidence 4.67%) after open heart surgery, which demands to recognize early indicative factors for avoiding the negative consequences in morbidity and mortality rate. Disfunction of at least 3 organs (MODS) is not a rare cause of prolonged hospital stay after open heart surgery and develops principally in patients with low cardiac output syndrome postoperatively.

0743 OUTCOME PREDICTION IN CARDIAC SURGERY

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INTRODUCTION. Mortality prediction in patients undergoing cardiac surgery has largely been studied by focusing on preoperative factors. Yet there is no consensus with respect to what constitutes the ideal outcome predictive tool in this subset of ICU patients. Objectives: To (i) describe the ICU cardiac surgery patient profile, (ii) evaluate the Euroscore (standard and logistic) in coronary artery bypass graft (CABG) surgery and (iii) ascertain factors associated with mortality.

METHODS. Method: A retrospective study conducted over a 1 year period in the Cardiothoracic ICU, in Johannesburg Hospital, South Africa. Strata 8 software was utilised for statistical analysis.

RESULTS. Two hundred and forty-five patients were admitted during the study period following CABG (n=87), valve (n=127) and miscellaneous (n=31) surgery. The mean age was 49 years and the mean duration of ICU stay was 4.5 days. The overall mortality was 12.2%. The Euroscore (standard and logistic) did not predict outcome and was similar for CABG surgery survivors and nonsurvivors. Pre- operative insertion of an intraaortic balloon pump and preoperative cardiac failure were associated with a significant increase in mortality (p<0.05). The intraoperative bypass time was significantly longer in nonsurvivors compared to survivors (p<0.01). Postoperatively, major haemorrhage (>1 litre), nosocomial sepsis, extraction failure and organ failure were significantly higher in nonsurvivors compared to survivors (p<0.05). These observations pertain to the entire cohort.

CONCLUSION. The Euroscore is a poor predictor of outcome in our patients. The risk factors identified in this analysis need prospective validation.

0744 INITIAL EXPERIENCE IN CARDIAC SURGERY COMPARED TO THE EUROPEAN WORKGROUP EXPERIENCE

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INTRODUCTION. A tool to assess the potential need of improvements in quality of cardiac surgical (CS) care can be the review of databases. We analyse our database to assess the quality of our initial 3 years experience with postoperative CS care.

METHODS. Prospective study of 1049 patients undergoing CS admitted in the ICU during 3 years. The collected data and two outcome measures (time to extubation and ICU length of stay) were compared to the European results.

RESULTS. The average age was 64 years in both groups and there were more women in our group (g): 34% versus (vs) 29%. The main interventions in our g. compared to the European g. were: Coronary (C.) surgery (s.) with EC- 40% vs 57%; Valvular (V .) s.- 34% vs 19%; and combined C. and V . s.- 14% vs 9%.

| TABLE 1. | Comorbidities and procedure–related risk factors: Mean or % |
|-----------------|-----------------------------|
| Euro n=4400 | Son Dureta H. n=1049 |
| **COPD (%)** | 6 (1-12) | 12.1 |
| **Creat >171 umol/l (%)** | 4.4 (1-9) | 1.4 |
| **EF <30% (%)** | 4.2 (0-13) | 3.4 |
| **Minutes E.C. circulat.** | 101 (72-126) | 100 ± 47 |
| **Min. Ao crossclump.** | 64 (51-75) | 72 ± 39 |
| **Inotropes: High D. (%)** | 8 (1-21) | 8.9 |
| **IABp, balloon pump (%)** | 4 (1-14) | 1.2 |
| **Failed extubation (%)** | 2 (0-7) | 3 |
| **(range between centres)** |

| TABLE 2. | Outcomes and mortality: Median or % |
|-----------------|-----------------------------|
| Euro n=4400 | Son Dureta H. n=1049 |
| **Time to extubation** | 12 hours | 6 hours |
| **ICU length of stay** | 38 hours | 48 hours |
| **ICU mortality (%)** | 2.8 | 1.6 |

CONCLUSION. The good quality results in terms of ICU length of stay or time to extubation suggest an adequate postoperative CS care.

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0745
POSTOPERATIVE OF CARDIAC SURGERY IN THE OLDEST PATIENTS: MORTALITY AND COMPLICATIONS IN THE ICU

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INTRODUCTION. Our goal was to analyze the morbidity, mortality, and perioperative risk factors of patients 80 years old or older in the postoperative period after cardiac surgery.

METHODS. A retrospective identified 142 consecutive patients with age ≥ 80 year old underwent cardiac surgery between January 2002 and December 2005. The surgery consisted in coronary revascularization, valvular mixed and others. We recorded demographics data, pre-surgery comorbidity, type of surgery and technique (pump-off pump), postoperative complications, ICU length of stay and mortality. Univariate analysis was performed using c 2 test and t Student and for the multivariate it was used logistic regression.

RESULTS. The mortality rate of study group was 14.1% (coronary surgery 13.3%, valvular 12.1% and mixed 28.6%). The mortality of the whole group of patients was 6.2%. After multivariate analysis only perioperative infarction (OR 7.6 IC 95% 1.14-50.8, p<0.036), shock (OR 13.2 IC 95% 3.08-56.9, p=0.001), neurological (OR 10.3 IC 95% 1.32-59.8, p=0.033) and digestive complications remained as independent factors that predicted mortality. The length of stay in ICU were 4.7. In the entire group the stay was of 3.2 days.

0746
LONG TERM PHYSICAL EFFECTS IN SURVIVORS OF PEDIATRIC INTENSIVE CARE

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INTRODUCTION. The development of pediatric intensive care (IC) has contributed to improved survival in critically ill children. Little is known about long term physical sequelae in pediatric IC survivors, but they might resemble the findings in adult IC survivors. Awareness of sequelae due to the original illness and its treatment may result in changes in management in the acute phase. The purpose of this study was to evaluate physical sequelae of survivors of Pediatric Intensive Care Units (PICU).

METHODS. From December 2002 trough October 2005 all acute admissions to our PICU, were examined in the out-patient follow-up clinic, three months after discharge. Almost 50% of patients have a chronic illness and almost 20% of patients have neurological problems. Further research is warranted to determine risk factors and methods to prevent sequelae due to intensive care treatment.

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0747
LONG-TERM FOLLOW-UP OF HIGH RISK SURGICAL ICU PATIENTS: SURVIVAL, READMISSION, FUNCTIONAL OUTCOME

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INTRODUCTION. To document the long-term (4 years) outcome (survival, hospital readmission, dependency on medical care) of adult, high risk, surgical ICU patients.

METHODS. In this follow-up analysis of a large, randomized controlled trial (1), we assessed long-term outcome in 1548 patients admitted after high risk or complicated surgery. Long-term outcome was quantified as (a) 4 years survival, (b) incidence of hospital re-admission, and (c) level of activity and medical care requirements at 4 years assessed by the Karnofsky Score.

RESULTS. Four years after ICU admission, mortality at hospital discharge [5.5% in the high-risk cardiac surgery subgroup (N=970) with a Euroscore predicted hospital mortality of 9.9% and 15% for the other patients admitted for complications after other types of high risk surgery (N=578)] had increased to 14.8% and 43.9% respectively. Intensive insulin therapy, previously reported to reduce ICU and hospital mortality (1), was also associated with lower 4-years mortality, which was significant in the cardiac surgery subgroup (2). Among hospital survivors, during the 4 years follow-up, hospital re-admission was needed in 28% of cardiac surgery patients [for a median duration of 10 (IQR 5-30) days] and in 39% of the other patients (20 [9-41] days) (p=0.001). Insulin therapy did not affect re-admission rate. At 4 years follow-up, survivors revealed a Karnofsky score of 80 (70-90)% in the cardiac surgery patients and 80 (60-100)% in the others, with no effect of insulin therapy.

CONCLUSION. Four years after ICU admission, cumulative mortality was almost 3-fold higher than the hospital mortality. Hospital readmission had been required quite often. After 4 years, however, survivors revealed an acceptable level of activity and medical care requirements, with > 80% of them leading an independent life.

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0748
STATIC VS DYNAMIC PARAMETERS OF FLUID RESPONSIVENESS IN VENTILATED PATIENTS AFTER MAJOR SURGERY

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INTRODUCTION. In the weaning period from anesthesia after major surgery, borderline hypovolemia is frequent. Cardiac output monitoring is not always justified and volume replacement is guided by Central Venous Pressure (CVP) even if its effectiveness is questionable. Analysis of changes of arterial blood pressure has been suggested to be more reliable. Aim of this study was to compare the prediction of volume responsiveness using these two approaches, considering ScvO2 and the response to a volume challenge as independent variables.

METHODS. CVP, Pulse Pressure Variation (PPV), Systolic Pressure Variation (SPV) and its compo- nent (PDown) were measured in 23 mechanically ventilated patients in VC mode at Recovery Room admission (T0), then after 500 mL of hydroxyethyl starch 6%/T1. Patients were divided up at T0 in fluid responders (R) and non responders (NR), depending on the responsiveness cut-off of each parameter. We explored, in each group, the lead-effect (T0 vs T1) for the ordinating parameter and for ScvO2. We worked out the percentages of concordant classifications (R + NR/total no patients x 100) for each pair of indicators.

RESULTS. Concordance in responsiveness classification (T0, T1) between CVP and each of the dy- namic parameter was poor (range 43.5% - 60.9%), while for each couple of dynamic parameters was high (range 73.9% - 95.7%).

CONCLUSION. Dynamic indexes fit better with ScvO2 than CVP. They should be used preferentially to CVP to predict fluid responsiveness after major surgery when invasive hemodynamic monitoring is not available.
VASCULAR SURGERY IN OCTOGENARIANS: SHOULD AGE LIMIT SELECTION OF PATIENTS?

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INTRODUCTION. With the mean age increase of Brazilian population, more and more elderly patients are submitted to complex cardiovascular surgical procedures. Octogenarians represent a very special demographic group. Decision to submit them to complex procedures is very difficult because there is a high incidence of comorbidities in this population.

METHODS. Observational retrospective study with immediate post-operative patients admitted at the intensive care unit (ICU) of a private hospital in Rio de Janeiro from May 2004 thru June 2005. Demographics, clinical and laboratory data were collected. We divided patients in two groups, according with age at surgery’s day. Group I (GI): age > 80 years, Group II (GII): age < 80 years. Data were compared using SPSS for version 10. For categorical data we used ANOVA, and for numerical data Student T Test.

RESULTS. 32 patients formed GI with 40.67% (n=13) of women. 136 patients formed GII with 26.47% (n=36) of women. Age of GI varied from 80 to 92 years old, with mean age of 84.28 ± 2.98 years old and from 19 to 79 years old, with mean age of 64.76 ± 14.39 years old in GII. In surgical procedures were: 43.75% of Carotid Endarterectomy (CE) (n=14), 25% of Inferior Limbs By-Pass Revascularization (ILR) (n=8), 9.38% of Inferior Limbs Arterial Angioplasty (ILA) (n=3), 6.25% of Carotid Arterioplasty (CA) (n=2) and 15.63% of other procedures. In GI, distribution were: 25.74% of CE (n=5), 16.18% of ILR (n=2), 15.44% of IIA (n=2), 3.68% of CA (n=3) and 39.97% of other procedures. We did not observe significant differences in systemic hypertension, chronic renal disease and cerebrovascular disease between GI and GII. Heart Failure (HF) and Chronic Pulmonary Obstructive Disease (CPOD) were more prevalent in GI (HF=20.59% X 6.25%, p<0.05, CPOD=10.29% X 0%, p<0.05). Body Mass Index (BMI) = 25.17 ± 4 GI X 25.32 ± 3.51 (GII), APACHE II = 16.94 ± 4.17 (GII) X 14.96 ± 6.32 (GII), and Length of Stay at ICU = 2.13 ± 3.57 days X 3.27 ± 15.81 days) were equal in both groups. Mortality was very similar (13.3%, GI X 5.88%, GII).

CONCLUSION. The GI didn’t show evidence of higher morbidity or mortality when compared with GII.

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HYPERTOPHERUSION IS ASSOCIATED WITH INCREASED MORTALITY IN HEMODYNAMICALLY STABLE SURGICAL PATIENTS

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INTRODUCTION. Taking into consideration that elevated blood lactate level is a basic biochemical expression of hypoperfusion, we evaluated this increase as a prognostic factor in hemodynamically stable surgical patients who were admitted to our ICU.

METHODS. We studied 24 high risk surgical patients (aged 3±17 yrs), who were admitted to the ICU postoperatively and who remained hemodynamically stable during their first day of stay. Heart surgery patients or patients who had been treated with inotropic agents during surgery were excluded. During the first day of ICU stay, the patients were on mechanical ventilation and blood lactate levels were evaluated on repeated measurements. Mean arterial pressure, minimum and maximum heart rate, PaO2/ FO2 ratio and urine output were monitored.

RESULTS. Survivors (Group A, n=20) had statistically significant lower minimum blood lactate levels (1.8±1.2 vs. 3.5±2.8mmol/l, p<0.05) and statistically significant lower maximum blood lactate levels (2.7±1.6 vs. 5.6±4.5mmol/l, p<0.05) compared with non-survivors (Group B, n=4). Apart from higher lactate levels, non-survivors had significantly higher APACHE II score on admission (20.6±3. vs. 14±4.5, p<0.01) and longer duration of mechanical ventilation (3.6±4. vs 10±6.9days, p<0.05) compared with survivors. There was no statistically significant difference in mean arterial pressure, heart rate, urine output or PaO2/ FO2 ratio between the two groups.

CONCLUSION. Increased blood lactate levels are associated with increased mortality in hemodynamically stable surgical patients. In this group of patients, outcome is also affected by severity on admission (as measured by APACHE II score) and length of stay in the ICU.

Poster Sessions
Perioperative intensive care and short-term outcome 0752-0765

0752
THE NEW WAY FOR THE MANAGEMENT OF PATIENTS WITH ASYMPTOMATIC CAROTID ARTERY STENOSIS UNDERGOING CABG

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INTRODUCTION. Management of patients with concomitant coronary artery disease (CAD) and asymptomatic carotid artery stenosis (ACAS) remains controversial. This study investigates the relationship between the preoperative evaluation of cerebrovascular reactivity (CVR) to assuaged with with transcranial doppler (TCD) and cerebrovascular events in patients with ACAS undergoing coronary artery bypass grafting (CABG).

METHODS. Prospective pilot cohort study. Patients with unilateral or bilateral ACAS > 70% were preoperatively evaluated with transcranial doppler to detect CVR to hypercapnia in middle cerebral artery (MCA). Prophylactic carotid endarterectomy was not performed prior to CABG in patients with preserved CVR (Breath Holding Index < 0.69) in the territory of middle cerebral artery. Cerebral perfusion was monitored with TCD during CABG. Patients were followed up for the 30 day incidence of type 1 neurological injury. Prospective pilot cohort study. Patients with unilateral or bilateral ACAS more than 70% were preoperatively evaluated with transcranial doppler to detect perfusion characteristics in main cerebral arteries and CVR to hypercapnia in MCA. Prophylactic carotid endarterectomy was not performed prior to CABG in patients with normal symmetric flow velocity in MCA and preserved cerebrovascular reactivity (Breath Holding Index > 0.69) in the territory of MCA. Cerebral perfusion was monitored with TCD during CABG. Patients were followed up for the 30 day incidence of type 1 neurological injury.

RESULTS. 22 consecutive patients with ACAS > 70% were preoperatively evaluated. 3 of these patients had impaired cerebrovascular reactivity (Breath Index C 0.69) in the territory of the middle cerebral artery and underwent carotid endarterectomy prior to CABG. Remaining 19 patients had preserved CVR (Breath Holding Index > 0.69) in the territory of the MCA. In these patients carotid endarterectomy was not performed. All patient were carefully monitored using TCD in all crucial hemodynamic phases of the operation. No type 1 neurological injury occurred within 30 days postoperatively in these 22 patients.

CONCLUSION. This pilot study suggests possible management of patients with concomitant CABG and ACAS.

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**0753**

**CONTROL OF SERUM ALBUMIN LEVELS AFTER MAJOR GASTROINTESTINAL SURGERY**

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**INTRODUCTION.** Hypoalbuminaemia increases mortality, length of hospital stay and resource utilisation. We found hypoalbuminaemia detrimentally affected patient outcome.

**METHODS.** A retrospective study of 34 patients who underwent major surgery was performed. Data collected included peri-operative serum albumin levels, complications, administration of human albumin solution (HAS) and post-operative hospital stay.

**RESULTS.** All patients were hypoalbuminaemic post-operatively. Serum albumin fell 43.6% within 24 hours of operation. Mean length of hospital stay increased as post-operative albumin levels fell. Complications rates were 20% and 100% for patients with albumin levels above or below 20 g/l respectively. 23.5% of patients received HAS.

**CONCLUSION.** Hypoalbuminaemia increased length of stay and complication rates. Administration of HAS may help counter this. A prompt start to enteral/parenteral nutrition is desirable.

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**0754**

**LACTATE CLEARANCE AND OUTCOME IN POSTOPERATIVE PATIENTS**

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**INTRODUCTION.** We conducted this study to assess the impact of prolonged lactate clearance (LacCl) in surgical patients without any confounding factors such as renal or liver failure, severe sepsis or vasoactive drugs.

**METHODS.** A prospective observational study in a medical-surgical ICU, was conducted in the Hospital Español de Mendoza, between November 2004 and December 2005. All patients in the immediate postoperative period admitted to the unit who did not show any of the following exclusion criteria were included. Patients with intra-cardiac shunts, valvular cardiac disease or emergency operations were excluded. When asleep, a 5-F thermistor-tipped catheter (PV2015L20A, Pulsiocath², Pulsion Medical systems, Munich, Germany), inserted into the femoral artery, was connected to the FloTrac⁵ monitor. Arterial pressure (AP), heart rate, central venous pressure (CVP), and SVV were recorded before and after volume load with 10 ml kg⁻¹ hetastarch 6%. Patients were ventilated in the supine position with a total load of 8 ml kg⁻¹ during open (t1, t2) and closed chest (t3, t4) conditions. Pearson’s correlation coefficient (r²) was used to describe the relation between baseline SVV and CI before and after the volume load. P<0.05 was considered significant.

**RESULTS.** In 17 males and 3 females no vasoactive medication was used. TPCO and MAP increased in response to volume load (p<0.05). No positive correlation between CVP and changes in CI was found. The correlation between SVV-PiCCO and SVV-Vigileo was -0.21 and 0.02 during open thorax conditions, while these correlations were 0.75 and 0.51 during closed thorax conditions.

**CONCLUSION.** The present study suggests that SVV is superior to CVP in predicting fluid responsiveness during closed chest conditions, but failed to predict fluid responsiveness during open chest conditions, as was published before (2). SVV-PiCCO was more reliable than SVV-Vigileo.

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**0755**

**ASSESSMENT OF FLUID RESPONSIVENESS DURING OPEN AND CLOSED CHEST CONDITIONS IN CABG PATIENTS**

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**INTRODUCTION.** The validity and reliability of stroke volume variation (SVV), a sensitive indicator of fluid responsiveness in various patients (1), remains questionable before and after volume replacement in CABG patients with open and closed thorax. The aim of this study was to re-evaluate SVV in predicting fluid responsiveness by pulse contour analysis.

**METHODS.** After ethical approval and written informed consent, CABG-patients with an EF>35% were included. Patients with intra-cardiac shunts, valvular cardiac disease or emergency operations were excluded. When asleep, a 5-F thermistor-tipped catheter (PV2015L20A, Pulsiocath², Pulsion Medical systems, Munich, Germany), inserted into the femoral artery, was connected to the FloTrac⁵ monitor. Arterial pressure (AP), heart rate, central venous pressure (CVP), and SVV were recorded before and after volume load with 10 ml kg⁻¹ hetastarch 6%. Patients were ventilated in the supine position with a total load of 8 ml kg⁻¹ during open (t1, t2) and closed chest (t3, t4) conditions. Pearson’s correlation coefficient (r²) was used to describe the relation between baseline SVV and CI before and after the volume load. P<0.05 was considered significant.

**RESULTS.** In 17 males and 3 females no vasoactive medication was used. TPCO and MAP increased in response to volume load (p<0.05). No positive correlation between CVP and changes in CI was found. The correlation between SVV-PiCCO and SVV-Vigileo was -0.21 and 0.02 during open thorax conditions, while these correlations were 0.75 and 0.51 during closed thorax conditions.

**CONCLUSION.** The present study suggests that SVV is superior to CVP in predicting fluid responsiveness during closed chest conditions, but failed to predict fluid responsiveness during open chest conditions, as was published before (2). SVV-PiCCO was more reliable than SVV-Vigileo.

**REFERENCE(S).** 1) Rex S et al. BJA 2004; 93: 782-8. 2. Reuter D A et al. BJA 2005; 94: 316-23.

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**0756**

**VALIDATION OF CONTINUOUS CARDIAC OUTPUT MEASUREMENT USING THE ARTERIAL PULSE WAVE IN CARDIAC SURGERY**

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**INTRODUCTION.** Intermittent bolus thermocatheter CO (ICOC) and continuous CO (CCO) measurements using pulmonary artery catheters (PAC) are the most preferred methods of CO determination. However the insertion of PAC has been questioned. Less invasive methods are gaining clinical acceptance. The aim of this study was to validate a new arterial pressure-based CO device (FloTrac, Edwards Lifesciences) which requires access to an artery and does not require calibration.

**METHODS.** In 20 cardiac surgical pts CO was monitored for 24 hours after surgery. An arterial pressure based algorithm calculated CO from arterial pressure (APCO) and a PAC routinely used to measure CCO and ICO. Average age was 65.2±11.5 years. Bland-Altman analysis, based on 52 comparison points, was used to determine bias and precision in the comparison of the CO techniques.

**RESULTS.** Analysis between CCO and APCO yielded mean bias and precision of 0.3 and 0.72 respectively. The bias between APCO and ICO was -0.81. The bias between CCO and ICO was -0.51.

**CONCLUSION.** Data show that the APCO method provides a reliable, minimally invasive method for measuring CO, correlates well with both traditional ICO and CCO and does not require calibration to initiate monitoring or re-calibration after changes in vascular conditions.

**REFERENCE(S).** 1) J Cardiothoracic Vasc Anesth 18:185-189, 2004.
0757
PROGNOSTIC VALUE OF SERUM LACTATE IN 1284 PATIENTS IN INTENSIVE CARE

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INTRODUCTION. Lactic acidosis is a significant clinical problem indicating poor prognosis. How-
ever, few studies investigating prognostic value of blood lactate have been reported in critically ill patients, in addition patients population was small in these studies. This study was carried out to elucidate the critical level of serum lactate on admission in large number of intensive care patients.

METHODS. Serum lactate level and APACHE-II score were recorded on admission in 1284 patients who were admitted in general ICU. Lactate level for survival was analyzed using x2 test and Receiver Operating Curve (ROC). Patients were divided into high lactate group (group H) and low lactate group (group L) by the level of inflection on ROC. Cumulative survival rate was analyzed by Kaplan-Meiers method and significant differences between two groups were determined using log-rank analysis.

RESULTS. x2 test and ROC revealed that most predictive value for survival was 10 mmol/L. Kaplan-
Meiers analysis showed that 28-day survival rate was 0.45 in group H (x2=10 mmol/L), compared with 0.95 for group L (<10 mmol/L). Significant correlation was seen between serum lactate level and APACHE-II score in patients with cardiovascular disease (r=0.47), but not in septic patients.

CONCLUSION. Serum lactate level on admission was a predictor of mortality except that in septic patients. Critical serum level for survival was 10 mmol/L.

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2. Peretz D I, Scott H M, Duff J, Dossetor J B, Mac Lean L D, McGregor M: The significance of lactic acidemia in the shock syndrome. Ann N Y Acad Sci 1965;31;1133-41.

0758
SEVOFLURANE ADMINISTRATION BY ANACONDA® DEVICE VS PROPFOF + REMIFENTANIL FOR ANALGO-SEDATION IN ICU

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INTRODUCTION. we evaluated feasibility, awakening time, and influence on vital signs of analgo-
sedation obtained with Sevoflurane delivered through AnaConDa® (Anesthetic Conserving Device) in mechanically ventilated ICU patients. AnaConDa is a filter able to vaporetize and trap up to 90% of sevoflurane administered through an infusion pump. The small amount of Sevoflurane escaping in respiratory limb is drained by the standard anaesthetic gas scavenging system.

METHODS. 12 consecutive patients requiring sedation and ventilated for no more than 48 hrs. were enrolled in the study (age 68±15) Exclusion criteria were: CNS abnormalities, hemodynamic insta-
bility, pregnancy, liver and renal failure. Sedation level was evaluated with Ramsay and RASS score (awake = Ramsay 0, sedated = Ramsay 4 and RASS≤5) During Sevoflurane administration (SevAn) concentration (%/%) was monitored with standard anesthetic agent analyzer (Drager Scilo) Study protocol included 2 hours treatment with standard Propofol/remifentanil ProRe (1) followed by 2 hours of SevAn and a final step of 2 hours with ProRe (2). Between each step drug administration was interrupted in order to evaluate awakening time. Patients were monitored with Bi Spectral Index.

RESULTS. In all patients SevAn sedation was feasible. The equipment dosage (defined according to the sedation scores) were: ProRe (1) Propofol 3.1±1.7 mg/kg/h, Re 0.2±0.06 (gammax/ min), SevAn (Finsp ±1.4%), ProRe (2) (Pro 2.5±1.7 mg/kg/h, Re 0.1±0.05 (gammax/ min). SevAn sedation was not associated to significant modification of blood gas, urine output and liver function as indicated by iOGlucose (LitiMon, Pulson). Despite similar sedation level, BIS score resulted lower with SevAn in comparison with ProRe. Awakening time, SxO2, heart rate (HR), Minute Ventilation (MV) and respiratory rate (RR) were significantly higher during SevAn. Environmental contamination was below safety cut off values.

CONCLUSION. SevAn sedation in ICU is feasible, effective and tolerable. SevAn resulted in lower inhibition of respiratory drive and HR in comparison to ProRe even in the presence of similar sedation levels. Additional studies are needed to evaluate these findings.

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0759
DOES MORPHIN, SUFENTANYL, FENTANYL AND REMIFENTANYL INDUCE HYPER-
ALGESIA IN THE INTENSIVE CARE

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INTRODUCTION. Common narcotics may induce hyperalgesia by directly or indirectly modulating N-Methyl-D-Aspartate receptors as well as impairing response to pain (1). The aim of this study was to investigate the effects of morphin, sufentanil, fentanyl and remifentanil in critically ill non - surgical and pain-free patients needing transient sedation for greater than 1 day.

METHODS. Ethics Committee as well as familial consent were obtained in all study patients. We defined four groups (G) of 25 randomized patients who were sedated using a blinded narcotic infusion of: 1) G1: morphine (0.001-0.8 mg/kg/h); 2) G2: sufentanil (0.1-0.5 μg/kg/min); 3) G3: fentanyl (1-5 μg/kg/min); 4) G4: remifentanil (0.04-0.25 μg/kg/min) and midazolam (0.1-3 μg/kg/min) to achieve optimal sedation as defined by a Sedation Agitation Scale (SAS) between 3 to 4 and a Dolor Comportement Scale (DAS) between 3 to 4. At day 8, evaluation of induced pain was estimated byVAS and treated by Paracetamol (1g/hb) and Tramadol (100mg/6h) to keep VAS<4. For statistical analysis a Shapiro-Wilk test, Wilcox and a Student T-test were used.

RESULTS. The different groups were comparable in terms of age (48±19 years), gender (35% female), Simplified Acute Physiology Score (SAPS 28±11) and mean ventilation time (36±18 hours).

CONCLUSION. Morphine, sufentanil, fentanyl and remifentanil induced hyperalgesia in non-surgical pain-free patients in an Intensive Care Unit setting when these drugs were infused over at least one day. Morphine is the most potent agent and induces the longest hyperalgesic periods. Remifentanyl and fentanyl facilitate a more rapid evolution.

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(2) A M Kelly, Emerg. Med. J. 2001;18:205-207

0760
TECHNIQUE FOR INDUCTION OF ANAESTHESIA IN THE CRITICALLY ILL: A SUR-
VEY OF UK ANAESTHETISTS

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INTRODUCTION. Critically ill patients may be cared for temporarily by physicians not regularly working in critical care. The effects of drugs used for induction of anaesthesia has been debated (1).

METHODS. Postal survey of 250 UK anaesthetists examining drug preferences for rapid sequence induction in 4 scenarios: Emergency laparotomy, a critically ill patient, severe traumatic brain injury, and a patient with severe cardiac disease presenting for anaesthesia.

RESULTS. 134 Surveys were returned. Induction agent preferences are shown in table 1. Adjuvant drug preferences are shown in table 2. Suxamethonium was preferred by 92.5% for laparotomy, 77.5% for the critically ill, 89.5% for head injury, and 78.5% in the cardiac disease scenario. The main alter-
native agent preferred was rocuronium.

TABLE 1. Induction Agent Choice

|            | Thiopentone | Propofol | Etomidate | Ketamine | Other |
|------------|-------------|----------|-----------|----------|-------|
| %          | %           | %        | %         | %        | %     |
| Laparotomy | 64.2        | 23.1     | 11.9      | 0.7      | 0     |
| Critically Ill | 29.6     | 22.5     | 37.5      | 4.8      | 5.6   |
| Brain Injury | 77.4     | 16.9     | 5.6       | 0        | 0     |
| Cardiac Disease | 24.4    | 19.8     | 48.4      | 1.6      | 4.8   |

TABLE 2. Adjuvant Drug Choices

|            | Alfentanil | Fentanyl | Remifentanil | Morphine | None |
|------------|-----------|----------|--------------|----------|------|
| %          | %         | %        | %            | %        | %    |
| Laparotomy | 8.2       | 32.1     | 3.7          | 0        | 56.0 |
| Critically Ill | 10.0     | 23.3     | 0.8          | 1.6      | 64.2 |
| Brain Injury | 25.8     | 28.2     | 0.0          | 0        | 46.0 |
| Cardiac Disease | 12.9    | 55.6     | 0.0          | 0        | 25.8 |

CONCLUSION. Preference for etomidate is common, despite debate regarding its effects on adrenal dysfunction in the critically ill (1). If adjuvant opioids are desired fentanyl is preferred by most respon-
dents.

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0762  
IDENTIFICATION OF THE HIGH-RISK SURGICAL POPULATION IN TWO UK HOSPITALS

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INTRODUCTION. Little is known about the population of general surgical patients at high risk of complications and death. Recent research has suggested this population may be much larger than previously thought.

METHODS. Data was extracted on in-patient general surgical procedures and critical care admissions in two NHS hospitals between April 2002 and March 2005. High-risk surgical procedures were defined prospectively as those for which the mortality rate was 5% or greater.

RESULTS. There were 26,221 surgical procedures (median age 56 years [38-72]). 16,399 were elective (64 deaths [0.20%]) and 9,822 were emergencies (327 deaths [3.3%]). A high-risk population of 2,431 patients was identified which accounted for 79.5% of deaths but only 9.2% of procedures. This population had a prolonged hospital stay. There were 1,180 critical care admissions with 151 deaths [12.8%]. Critical care stays were short (median 1.6 days [IQR 0.9 - 3.7]) but hospital admissions for those admitted to critical care were prolonged (median 22 days [IQR 13 - 48]). Data on cause of death was collected for all patients.

TABLE 1. Comparison of high-risk and standard populations of surgical patients

|                  | Standard-risk population | High-risk population |
|------------------|--------------------------|----------------------|
| n                | 23,790                   | 2,431                |
| Age              | 58 (56-72)               | 64 (48-76)           |
| Emergency procedures (%) | 7.767 (32.6%)          | 1.965 (80.8%)        |
| Mortality (%)    | 80 (0.34%)               | 311 (12.8%)          |

CONCLUSION. A large high-risk surgical population accounts for less than 10% of surgical procedures but 80% of deaths. Fewer than half these patients are admitted to critical care. These figures are consistent with similar estimates for the UK as a whole.

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0763  
BARIATRIC SURGERY POSTOPERATORIUM: COMPLICATIONS IN OPEN VERSUS LAPAROSCOPIC GASTROPLASTY

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INTRODUCTION. Morbid obesity is one of the most important public health problems in our days and the bariatric surgery became an option to patients with 55 or higher body mass index (BMI) and obesity related complications (hypertension, diabetes, etc.). The study objective was to follow-up gastroplasty postoperatoriurn patients in ICU and find relationship between medical and surgical complications and operation type (open vs laparoscopic procedures).

METHODS. We analised the early complications and it’s correlation with surgical procedure type in 278 gastroplasty postoperatoriurn patients admitted to the ICU in 10 months follow-up. The statistical analysis used Fisher test. We accepted p<0.05 as significance level.

RESULTS. We analised 278 patients. 139 (50%) were open and 139 (50%) laparoscopic surgery. In the open gastroplasty group, 43 patients (30.94%) were men and 96 (69.06%) women, with mean age of 37.02 ± 10.90 years old and mean BMI of 46.89 ± 7.76; in the laparoscopic gastroplasty group, 44 patients (31.65%) were men and 95 (68.35%) women, with mean age of 36.87 ± 10.85 years old and mean BMI of 46.88 ± 7.38. We observed only 1 case of atelectasia (laparoscopic surgery), 1 bleeding and 1 rhabdomyolysis (open surgery). There were 3 fistula (2.17%) in open surgery and 4 (2.88%) in laparoscopic group (p=0.28). The only one death occurred in one of the laparoscopic fistula patients.

CONCLUSION. There is no statistical difference in complications and death between open versus laparoscopic surgery for obesity.
CEREBRAL AND SYSTEMIC HEMODYNAMICS IN THE EARLY POSTOPERATIVE COURSE OF CARDIAC SURGERY

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INTRODUCTION. The aim of this study was to observe some systemic blood flow (SBF) and cerebral blood flow (CBF) relationships during the early postoperative (PO) period of cardiovascular surgery (CVS).

METHODS. Subjects: patients at admission to ICU after CVS (coronary artery bypass grafting, valvular replacements, aortic repair and bypass). Data were collected at 2h (t1) and 20h (t2) after CVS ending. Main variables: SBF estimated by cardiac output, and CBF by doppler ultrasonography (DUS)-mean flow velocity [from both middle cerebral arteries (MCA), and left internal carotid artery (ICA)]. Main techniques: cardiac output measured by thermodilution and transcranial DUS (Multidop DWL, Germany).

RESULTS. Twenty eight patients were put into 2 groups: 1) PO of CVS with cardiopulmonary bypass (CPB) (n = 18), and 2) PO of CVS without CPB (n = 10). CBF estimates were found to be initially decreased (at t1) in all patients though afterwards (at t2) returned to normal in both groups. These increases of MCA flow velocities were accompanied by stroke volume rising in the group without CPB, which did not occur in CPB group (Table). A significant association between mean velocity of MCA and stroke volume at t1 was found for the CPB group (rs = -0.57, p <0.05).

|                       | CVS with CPB t1 | t2 | CVS without CPB t1 | t2 |
|-----------------------|----------------|----|-------------------|----|
| Right MCA mean velocity, cm/s | 43.1 (12.8) | 52.9 (17.4)* | 36.4 (14.2) | 53.2 (19)* |
| Left MCA mean velocity, cm/s  | 44.7 (11.9) | 59.4 (19.4)* | 42.1 (16.3) | 61.1 (18.7)* |
| Left ICA mean velocity, cm/s   | 40.8 (13) | 42.5 (10.4) | 29.6 (9.3) | 35.9 (6.2) |
| Mean Arterial Pressure, mm Hg  | 73.6 (6.7) | 78.1 (11.7) | 78.9 (8.7) | 84.9 (13.9) |
| Cardiac Index, L/min/m²        | 2.59 (0.91) | 2.94 (1.25) | 2.38 (0.75) | 2.81 (0.43)* |
| Stroke Volume Index, mL/beat/m²| 30.8 (8.5) | 32.7 (9.5) | 32.4 (8) | 39.7 (8.9)* |
| Oxygen Delivery, mL/min/m²     | 708 (313) | 799 (387) | 674 (197) | 802 (182) |

*p<0.05, between t1 and t2

CONCLUSION. These CVS procedures appeared to be associated to a temporary CBF decline. A SBF and CBF coupling occurred after CVS early in the absence of CPB, which might indicate an altered autoregulation of CBF.

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