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Meeting abstracts

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### ORAL PRESENTATIONS

#### O1

##### Incidence of penetrating trauma in Copenhagen from 2000 to 2007

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**Introduction:** Interpersonal violence with sharp objects and arms is relatively rare in Denmark, but has been the focus of attention from the media and general population.

This study describes the incidence of penetrating trauma treated by the Medical Emergency Care Unit in Copenhagen (MECU) from 2000 to 2007.

**Methods:** The study is a historical cohort study with a 30-day follow-up. Patients with a primary diagnosis of penetrating trauma were included. In addition, patients with penetrating trauma as a secondary diagnosis were also included, if the primary diagnosis was multi-trauma, cardiac arrest, or the patient was found dead.

Only patients from the former H:S area were included. The physician manning the MECU prospectively registered data in an access database. Mortality after 30 days was later assessed via the Danish Civil Registry System.

The incidences were assessed by Poisson regression and we used logistic regression to analyse the risk of mortality in relation to the number of penetrating traumas.  $P < 0.05$  was considered significant.

**Results:** 764 patients were eligible for inclusion. We were unable to identify three patients without a Civil Registration System number. Of the remaining 761 patients, 86% were male with a median (interquartile range) age of 32 years (24–42). 12 foreigners could only be followed to hospital discharge.

The annual incidence of penetrating trauma remained unchanged at a median (interquartile range) 93 (88–105) ( $p = 0.39$ ). The percentages of trauma caused by violence, as well as 30-day mortality (median 6 per year), revealed no significant change ( $p = 0.71$  and  $p = 0.65$  respectively).

**Conclusion:** The incidence of penetrating trauma remained constant in Copenhagen during the years 2000–2007. Violence as well as 30-day mortality in relation to penetrating trauma was equally consistent.

#### O2

##### Microfinance in emergency medicine research or how much research can you get for 500 Dkr?

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**Introduction:** Research is essential for improving emergency care but it is often difficult to obtain funding. Microfinance (small grants for minor projects) could be a method of initiating research in overlooked areas [1] but may be difficult to carry out [2].

We describe how a microgrant (500, -Danish Kroner (Dkr)) facilitated a research project in emergency medicine.

**Methods:** A grant of 500 Dkr was provided by the Danish Society for Emergency Medicine towards a research project on acute admissions.

Hospital departments in Denmark with acute admissions (internal medicine) were contacted. The doctor on call was asked to fill out a questionnaire on the internet. Costs of distribution, collection and registration of questionnaires were virtually zero.

The grant was used to buy a gift certificate that doctors completing the questionnaire could win. Monetary incentives combined with mail and telephone is known to increase response rates of questionnaires [3].

**Results:** Responserate was 94.4%. The study has so far resulted in three manuscripts accepted for publication and one abstract.

• Doctors on interhospital transfers. Training and level of experience. Abstract at EuSEM 2009.

- Supervision og arbejdsfordeling ved modtagelse, og videre behandling, af akutte medicinske patienter.\*
- Level of training and experience in physicians performing interhospital transfers of adult internal medicine patients.\*\*
- Visitation og triage af akut indlagte medicinske patienter.\*

\*Ugeskrift for Læger, \*\*Emergency Medicine Journal.  
**Conclusion:** The microgrant was vital for the conduction of the study. The study has resulted in three articles and an abstract. Microfinance can be used to initiate research.

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3. Beebe TJ, Davern ME, McAlpine DD, Call KT and Rockwood TH: **Increasing response rates in a survey of Medicaid enrollees: the effect of a prepaid monetary incentive and mixed modes (mail and telephone).** *Med Care* 2005, **43**(4):411–414.

### O3

#### Early identification of patients at risk of deterioration in a surgical ward

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**Introduction:** Publications have identified deficiencies in the quality of medical care and the problems and risks of ward care. Staff awareness of deteriorating patients as well as management and timely intervention are frequently found to be inadequate, and earlier identification has the potential to improve outcome for these patients.

**Methods:** Focus is on acutely admitted patients with abdominal pain in a surgical department. In order to improve our practice, we thought it important to undertake a needs assessment of the management of acutely and potentially critically ill patients. The study design was interprofessional and consisted of a retrospective audit, focus group interviews with medical and nursing staff and full scale simulation in the ward.

**Results:** From the audit we identified the following problematic areas:

- Late recognition of patient deterioration
- Lack of systematic observation with specific intervals
- Lack of seeking advice early
- Discrepancies between medical and nursing reports
- Poor documentation

The focus group interviews revealed which common needs were identified as matters of concern:

- Early identification of patients at risk
- Lack of systematic observations and interdisciplinary guidelines
- Need for efficient communication and teamwork in acute settings
- Training and education of staff

Reviewing our test simulation we were confirmed of the results from the audit and the interviews and in CRM-terms in addition lack of re-evaluation and presence of fixation errors.

**Conclusion:** The data obtained from our survey were subsequently used to develop objectives for a curriculum to address the identified needs. We conclude that this form of needs assessment provides a useful means of identifying issues for structuring a relevant multiprofessional educational and training programme and for organizational changes.

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3. Fuhrmann, et al: **Incidence, staff awareness and mortality of patients at risk on general wards.** *Resuscitation* 2008, **77**(3):325–330.

### POSTER PRESENTATIONS

#### P1

#### End-tidal CO<sub>2</sub> in mechanical versus conventional CPR

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**Introduction:** Out-of-hospital cardiac arrest (OHCA) generally has a poor prognosis. The development and use of a mechanical chest compression device has been suggested as a measure to achieve sufficient and continuous cardiopulmonary resuscitation (CPR). The mechanical chest compression device (Autopulse<sup>®</sup>) consists of a battery-driven board with a band attached that applies a 20% anterior-posterior compression of the patient's thorax at a frequency of 80 per minute. The aim of this study was to compare patients treated with the mechanical chest compression device (Autopulse<sup>®</sup>) with patients treated with conventional CPR. End-tidal CO<sub>2</sub> (ETCO<sub>2</sub>) was used as a qualitative measure of circulation. We hypothesized that patients treated with Autopulse<sup>®</sup> had a higher ETCO<sub>2</sub>.

**Methods:** The study was conducted as a retrospective study. The patients included had OHCA and were treated by the mobile emergency care unit in Copenhagen in 2007. Only intubated patients with at least one registered ETCO<sub>2</sub> value were included. The treating physician prospectively recorded data in a database. If patients had more than one CO<sub>2</sub> value registered we analyzed both their median and maximum CO<sub>2</sub> values. The two groups were compared using the mean values (standard deviation) of either the median or max CO<sub>2</sub>. Mann-Whitney rank sum test was used for statistical analysis.

**Results:** In total, 491 patients had cardiac arrest, of those 158 where intubated and had at least one CO<sub>2</sub>-value. 91 (67,6%) patients with a mean age of 63 (15,3) were treated with Autopulse<sup>®</sup>, and 67 (42,4%) aged 64.7 (17,4) with conventional CPR. The mean values of both the median and the max CO<sub>2</sub> did

not differ between the two groups: 4,4 (2,0) kPa vs. 4,8 (2,0) kPa ( $p = 0.63$ ) and max CO<sub>2</sub> 4,9 (2,2) kPa vs. 5,3 (2,4) kPa ( $p = 0.89$ ), respectively.

**Conclusion:** We were not able to detect a significant difference between Autopulse® and conventional CPR in the amount of CO<sub>2</sub> expired. However, the study has multiple weaknesses and further investigations are proposed. Whether or not Autopulse® should be preferred in daily use depends on survival and neurological outcome in future studies.

## P2

### Cutting costs – the impact of price-lists on the cost development in the emergency department

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**Introduction:** In a recent study it was shown that physicians working at the Swedish emergency department (ED) often are unaware of the real costs for analyses and investigations performed. In this study, the possible impact of price-lists as visual instruments on the overall laboratory and radiology costs at the emergency department of Linköpings university hospital (LUH) was evaluated.

**Methods:** Price lists including the 91 most common laboratory analyses and the 39 most common radiological investigations performed at the emergency department of LUH were created by using the information provided by the radiology department and the clinical chemistry department of the hospital. Different modalities (capillary vs. venous blood samples) were listed separately. The lists were distributed to all physicians on-call in internal medicine by the internal email-provider in april 2008. Further lists were exposed above the working stations at the ED continually. The mean costs for laboratory and radiologic investigations for all medical and orthopaedic patients during the months of June and July 2007 and 2008 were calculated. Neither clinical nor admission procedures were changed during the period investigated. The physicians were blinded towards the study. Statistical analysis was performed using the Student's T-test.

**Results:** A total of 1442 orthopaedic and 1585 medical patients were attended to during June and July 2007. In June and July 2008, 1467 orthopaedic and 1637 medical patients required emergency service (a total increase of 1,7% of orthopaedic and 3,3% of medical patients). The mean costs per patient were 980,27 SKR for orthopaedic and 1081,36 SKR for medical patients in 2007, and in 2008 999,41 SKR (+1,95%) and 877,3 SKR (-18,8%) respectively. In orthopaedic patients, laboratory costs decreased by 9% whilst the costs for radiological examination increased by 5,4%. In medical patients, the costs for laboratory analysis decreased by 21,4% and for radiological examination by 20,59%.

**Conclusion:** The distribution and promotion of price lists as a tool to increase cost awareness at the emergency department resulted in a significant decrease in the investigation costs in the line investigated. It can be concluded that generally available price lists might be an effective tool to cut costs in public health care.

## P3

### The acute effect of a physiological bolus of growth hormone (GH) on insulin signalling pathways in striated muscle in healthy volunteers

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**Introduction:** Critical illness impacts GH secretion in a biphasic pattern. The initial stress response consists of activated growth hormone (GH) release, GH secretion is reduced in the chronic phase of critical illness. High levels of GH causes severe insulin resistance and proinflammation, which may contribute to the morbidity and mortality of acute critical illness. The molecular mechanisms subserving these insulin antagonistic effects are unknown, but in vitro studies suggest that insulin and GH share postreceptor signalling pathways. This study was preformed to investigate if there is a crosslink between the two signalling pathways in human striated muscle in vivo.

**Methods:** 8 healthy young men (age: 24, 56 year ± 1, 84) participated in a three-armed single-blinded randomised cross-over study. Prior to each study day the participants fasted 12 hours. In the morning the participants were randomised to receive either 1) an intravenous GH bolus (0.5 mg). 2) Intravenous GH bolus and oral glucose (75 g). 3) Intravenous saline and oral glucose (75 g). 4 muscle biopsies were taken each study day at time 0 min, 30 min, 60 min, 120 min. Blood samples were collected regularly throughout each study day.

**Results:** GH induced an increase in AUC<sub>glucose</sub> (area under glucose curve)  $p = 0.05$ , without any significant changes in insulin levels. GH induced phosphorylation of STAT5 at 30 and 60 min. independently of oral glucose intake. Conversely, oral glucose intake induces phosphorylation of the insulin signalling proteins Akt and AS160 independently of GH exposure.

**Conclusion:** • GH induces acutely insulin resistance, also during a conventional OGTT (oral glucose tolerance test).  
• GH activates STAT5 acutely in striated muscle independently of insulin while oral glucose intake activates insulin signalling pathways in striated muscle independently of GH.  
• GH-induced insulin resistance does not seem to be mediated by downregulation of insulin signalling pathways in human models.

## P4

### GCS in the prehospital setting is an adequate predictor of outcome in comatose patients

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**Introduction:** Glasgow Coma Scale score (GCS) obtained in the hospital has been shown to predict mortality well [1].

However, the performance of GCS in the prehospital setting has not been previously studied. We hypothesized that GCS would be an adequate method for triage and for outcome prediction also when obtained prehospitally. It is crucial to identify lifethreatening emergencies in the very early phase in order to shorten the time for initial assessment and further in-hospital visitation, as the time spent in the Emergency Department (ED) is related to mortality [2].

**Methods:** Using amPHI<sup>®</sup>, the regional prehospital record-keeping system, we identified patients with an initial prehospital GCS < 9 over a 3-month period. Further information on these patients was collected from the Patient Administrative System and through review of the paper charts. Only patients admitted to the ED at Aalborg Hospital were included. Patients under 16 years were excluded.

**Results:** 60 patients were identified of which 23 (38%) were women. The overall mortality was 35%. The survivors were younger ( $p < 0.001$ ) and had a higher prehospital GCS ( $p = 0.003$ ) than non-survivors. Patients staying in-hospital had a significantly lower prehospital GCS ( $p = 0.015$ ) compared to patients dismissed from the ED. Poisoning represented the most common aetiology. A subgroup analysis showed that alcohol was involved in 30% of all cases and in 82% of the poisonings.

**Conclusion:** Patients with the lowest prehospital GCS-score had the highest mortality. There were no differences between the admissions to the intensive care unit and to the general ward in this material. We believe GCS to be a well-established score to help triage and communication between a prehospital setting and receiving emergency department.

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#### P5

##### Outcome and non-chemotherapeutic treatment in pleural empyema

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*Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 2009, **17(Suppl 2)**:P5

**Introduction:** The aim with this study was to describe correlations between hypothesised factors (surgery, local thrombolytic, nosocomial infection, late pleural drainage) and unfavourable outcome in pleural empyema.

**Methods:** Patients with positive culture in pleural fluids were identified in the laboratory database of a department of clinical microbiology in the period 1996–2004. Relevance was evaluated retrospectively by audit of the medical records. Additional patients were identified in the patient administrative system by ICD-10 code D186.0 or D186.9. Uni- and multivariate statistical analyses were used.

**Results:** 113 patients were diagnosed with pleural empyema in the period. Overall, 30% died, 30% had an insufficient recovery and 40% recovered. 25% ( $n = 28$ ) of the patients had surgery. 60% ( $n = 68$ ) of the cases were community acquired, 28% ( $n = 32$ ) nosocomial and 12% unknown. Unfavourable outcome was higher among the patients who did not have surgery (67% vs. 39%,  $p = 0.009$ ). Unfavourable outcome was higher among the patients with nosocomial infection (78% vs. 47%,  $p = 0.003$ ). Outcome did not correlate to local thrombolytic treatment (57% vs. 62%,  $p = 0.64$ ) or early pleura drainage (<8 days from admission), 56% vs. 61%,  $p = 0.60$ .

In multivariate analysis, we found a significantly increased rate of unfavourable outcome in patients treated without surgery (OR 3.4, CI: 1.20–9.8,  $p = 0.02$ ), but no correlation to local thrombolysis (OR 1.264, CI: 0.59–2.7,  $p = 0.55$ ) or pleura drainage >8 days after admission (OR 0.86, CI: 0.32–2.3,  $p = 0.76$ ), and a non-significant correlation to nosocomial infection (OR 0.37, CI: 0.13–1.12,  $p = 0.08$ ).

**Conclusion:** In univariate analysis, we found that patients with nosocomial infection or treated without surgery had a higher rate of unfavourable outcome. In multivariate analysis, unfavourable outcome was correlated to not being treated with surgery, but non-significantly ( $p = 0.08$ ) to having nosocomial infection.

#### P6

##### Cerebral net exchange of Brain-Derived Neurotrophic Factor (BDNF) during experimental systemic inflammation and hypoxaemia in humans

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Sepsis is notably associated with neuronal damage, an effect that may be exacerbated by hypoxaemia. The present study was designed to investigate if this interrelationship involves an effect on brain-derived neurotrophic factor (BDNF), an intrinsic neuroprotective agent which is released from the brain under normophysiological conditions [1]. We hypothesised that experimental systemic inflammation and hypoxaemia would abolish this release.

36 healthy male volunteers aged 25 (SD, 4) years were randomised to:

1. normoxia for 12 hours and a four-hour intravenous infusion of lipopolysaccharide (LPS) from 4–8 h (total dose 0.3 ng/kg),  $N = 12$

2. hypoxia for 12 hours (12.9% O<sub>2</sub>) and a four-hour intravenous infusion of saline from 4–8 h,  $N = 11$

3. hypoxia for 12 hours (12.9% O<sub>2</sub>) and a four-hour intravenous infusion of LPS from 4–8 h (total dose of 0.3 ng/kg), N = 13 Cerebral blood flow (CBF) was measured by the Kety-Schmidt technique, and arterio-jugular venous concentrations of BDNF were determined at baseline and 9 h. The cerebral net exchange was calculated by multiplying CBF with the arterio-jugular concentration differences of BDNF.

A cerebral release of BDNF was present at baseline (P < 0.005). This was attenuated in all three groups, but with no difference in the cerebral net exchange values from baseline or between interventions (NS, MANOVA). There was no effect of any of the interventions on the arterial levels of BDNF (NS, MANOVA). In conclusion, systemic inflammation and hypoxaemia may abolish the net cerebral release of BDNF in healthy humans.

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#### P7

##### **Pulse steroid therapy in acute airway obstruction in relapsing polychondritis**

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Relapsing polychondritis (RP) is a rare disease characterized by recurrent inflammation and destruction of cartilaginous structures and connective tissue. Extensive organ involvement can be seen. It is a generally progressive disease commonly involving the respiratory tract (>50%) and airway involvement is a major cause of death in RP.

We report a case of a 58-year old man diagnosed with RP in accordance with the modified diagnostic criteria of Damiani and Levine, whose clinical features included a severe respiratory tract chondritis. He was initially treated with NSAID and intramuscular methylprednisolone. Four weeks later a lack of response to the treatment and progressive respiratory involvement resulted in shifting him to oral prednisone (40–60 mg/daily) and gradual weekly reduction was planned, until a tapering dose could be reached. The patient however continued to have severe intermittent exacerbations of respiratory distress and was shortly hereafter hospitalized. Conventional therapy had little effect. Methotrexate was instituted and intravenous methylprednisolone pulse therapy (500 mg/daily) was given over a period of 3 days. The patients respiratory symptoms ameliorated remarkably rapidly and the patient continued the lower dose prednisone and methotrexate. No short term adverse reactions due to the pulse therapy were observed. Referral was made for an elective placement of a tracheo-bronchial stent due to the extensive airway involvement.

Pulse steroid therapy is a concept with a high daily dose of intravenous steroids over a short span of time (usually 1–5 days) and several regimens have been described. Doses of each pulse are not standardized but are usually 5–20 mg/kg for methylprednisolone (250–1000 mg). In most indications it is usually accompanied by continuous administration of lower dose steroids and immunosuppressive agents.

Pulse steroid therapy has been reported successful in treating patients with severe manifestations, where rapid immunosuppression and anti-inflammatory effect is desired. In RP it may especially be

helpful in acute airway obstruction and may allow stent placement (or tracheotomy) to be performed electively. Although it is considered cumulatively less toxic than sustained low dose steroid therapy significant adverse reactions may still occur. It should therefore be used in selected cases under careful monitoring.

#### P8

##### **Does cardio-pulmonary resuscitation influence perception of time?**

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**Introduction:** Time is an important factor in several phases of cardio-pulmonary resuscitation, e.g. external chest compressions, medicine-administration and defibrillation.

When performing CPR it is difficult to maintain a good perception of time and this may have negative consequences for patient survival. The purpose of this study was to determine whether the staff's perception of time was intact during CPR.

**Methods:** The study took place over a two day period, in connection with a scenario-based advanced cardio-pulmonary resuscitation training session at a regional hospital, using current advanced CPR guidelines. Ten cardiac arrest scenarios were performed on a computerized patient simulator. The participants were asked during CPR how much time was elapsed until the question was asked. After termination of scenarios participants were asked independently how long time the treatment lasted when terminated. An observer recorded the actual time.

**Results:** The study included 24 participants (eight resident physicians, eight intern physicians and eight nurses). The mean error was –19.6 seconds (SD +/- 84.3) in time elapsed since diagnosing the cardiac arrest until the first question regarding elapsed time was asked, ergo underestimation of time. Regarding elapsed time until termination of treatment, the mean error was 32.4 seconds (SD +/- 202.7), ergo overestimation of time. Both physicians and nurses underestimate and overestimate time.

**Conclusion:** Perception of time during and immediately after CPR is affected.

We found both overestimation and underestimation of time. This shows the importance of having one person on the cardiac arrest team responsible for keeping track of time.

#### P9

##### **Is this admission really relevant?**

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*Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 2009, **17(Suppl 2)**:P9

**Introduction:** Acutely admitted medical patients often present with a complex medical history. Patients admitted through an

acute medical admission unit (AMAU) has had symptoms for an unknown period of time before contacting a general practitioner or the emergency room. The history will vary from acute onset to more chronic illness with acute worsening or lack of response to a given treatment. In AMAUs with limited beds and a large number of acute admissions daily we often witness disagreement between general practitioners, doctors and nurses whether or not the patient at hand has to be acutely admitted or even admitted at all. We therefore conducted a questionnaire study including doctors and nurses at an AMAU to investigate how often the two groups disagree on the necessity of an acute admission.

**Methods:** During the period of 22<sup>nd</sup> of July and the 8<sup>th</sup> of August we asked nurses and doctors, admitting patients through an AMAU, whether or not they found the acute admissions relevant. The data was analysed using the Fleiss Kappa Coefficient Analysis and are presented descriptively.

**Results:** We received 138 answers from doctors and 213 from nurses, and have questionnaires regarding 67 patients where both the doctors and nurses had answered. Out of the 67 cases both groups found 17 of the admissions to be irrelevant. Using the Fleiss Kappa Analysis we find a  $\kappa$  value of 0.369. In 51 cases the nurses and doctors agreed whether or not the patient should or should not be admitted acutely, leaving the doctors and nurses in disagreement in 16 (23.9%) cases.

**Conclusion:** The doctors and nurses in our study often agree on whether or not a patient should or should not be admitted acutely. The Fleiss kappa analysis gave a fair agreement, when compared with Landis and Koch interoperation scale. In almost one in four cases the nurses and doctors have different opinions on whether or not the patient should be admitted acutely. The consequences of this, for the patients, would be purely theoretic in this presentation, seeing that we have not investigated any patient outcome regarding morbidity or mortality.

### P10 Prehospital evaluation of patients with chronic obstructive pulmonary disease

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**Introduction:** The mobile emergency care unit (MECU) in Copenhagen visits emergency patients in an urban setting and is manned by an experienced anesthesiologist and a specially trained fireman. The function of the MECU is to perform emergency treatment and evaluate the need for further treatment in a hospital. The aim of this study was to assess predictive measures of subsequent hospital admission in primarily completed patients with acute exacerbation of chronic obstructive pulmonary disease (COPD).

**Methods:** Through the MECU database we identified patients treated in the year 2002 with the primary diagnosis COPD. Depending on the MECU physician charts these patients were subdivided into a primary admitted group and a primary completed group. The MECU charts of the completed patients

were then scrutinized for following parameters: age, sex, stethoscopic findings (normal or abnormal), saturation by pulse oxymetry (pre and post treatment), systolic blood pressure, treatment (inhaled beta-agonist and/or corticosteroid), and denial of hospital admission (yes or no). In addition, the completed patients were crosschecked with the Danish Central Personal Register for admissions within 72 hours of the MECU visit. Statistical analysis was performed comparing the primary treated patient with and without subsequent admission within 72 hours.

**Results:** In the year 2002 the MECU treated a total of 338 patients with COPD as primary diagnosis. Following initial treatment a large part, comprising 274 (81%) of the COPD patients, were directly admitted to a hospital. 64 (19%) of COPD patients were considered sufficiently treated by the emergency physician to stay in their own home. Of these patients left at home, 12 (19%) were subsequently admitted in a hospital within 72 h. The subsequent admitted patients were on average 7,5 years older than those who were not admitted ( $p < 0.01$ ). Regarding the other parameters there were no statistically significant differences between the two groups.

**Conclusion:** The evaluation of COPD patients with acute exacerbation is a considerable clinical challenge. The present study was not able to identify easy accessible clinical predictors, besides age, that in an acute setting allows discrimination between COPD patients, who needs admission within 72 hours and those who do not.

### P11 Therapeutic hypothermia after cardiac arrest—a survey of the use in Denmark

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**Introduction:** Anoxia causes brain injury. Various studies suggest that mild therapeutic hypothermia (TH) improves neurologic outcome after successfully resuscitated cardiac arrest. Previous studies have indicated that the uptake of TH by intensive care units (ICU) around the world is poor although recommendations supporting the use of TH have been published. We designed an internet-based survey in order to reveal the routine at ICU's in Denmark.

**Methods:** An introduction to the study and an individual link to the survey were emailed to department heads of Danish ICU's. Questions were asked on the demography of the hospital and ICU, the use of TH, methods employed, reasons why they had not incorporated TH and whether the center had composed a standard operation procedure (SOP).

ICU's who did not respond to our enquiry received reminders, three at the most.

**Results:** Of 32 ICU's, 19 completed the survey (59%), one was excluded as the hospital did not receive emergency admissions. The hospitals had a mean of 374 beds and the ICU's had a mean of 9.4 beds. Three hospitals had an invasive cardiology department.

Seventeen departments (94%) had introduced TH; the first department introduced it in 2002. The number of patients treated with TH ranged between "a few" and 250. Five (29%) departments began TH in the pre-hospital phase, seven in the emergency department (41%) and five in the ICU (29%).

Three departments (18%) offered TH only to patients with VF/VT as the initial rhythm. Thirteen departments (76%) offered TH regardless of presenting rhythm and one (6%) was unanswered. Sixteen had a SOP for TH (94%).

None of the departments has a structured follow-up procedure for these patients and only one department (6%) participated in a multicenter database on the use of TH.

**Conclusion:** At 17 ICU's in Denmark, mild therapeutic hypothermia after cardiac arrest is implemented as a standard treatment. Thirteen ICU's chose not to participate in this study, therefore we do not have complete data of the use of TH at ICU's in Denmark.

## P12

### Junior doctors can cooperate in the Acute Admission Department

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**Introduction:** Kolding Hospital was one of the first hospitals in Denmark to set up an Acute Admission Department (called AMA) receiving acute patients for all specialties. Traditionally the junior doctors have their internship in one specialized department and they are only seeing patients referred to that speciality. Often one doctor can be very busy and the patients waiting, while other doctors are being inactive. We introduced the junior doctors to the most common conditions in internal medicine, surgery and orthopaedic surgery and then allowed them receive, treat and admit patients regardless of the speciality they were referred to. A principle was made: "A doctor does not sleep if a patient is waiting".

**Methods:** The new cooperation was evaluated through a questionnaire with 14 qualitative questions to the junior doctors. The answers were written in each doctor's own language and the answers were analyzed together by the investigators. The participants were also asked to grade the idea behind new cooperation and the way it was implemented (from 1–10, where 1 is the lowest).

**Results:** 20 questionnaires were distributed, 14 were returned. Generally the junior doctors were positive about the new way of working, but a few found it difficult to grasp the wide span between the specialties. The possibility for helping each other was considered valuable both regarding the work load and the social interaction. One group found that the cooperation didn't do much for their own development as doctors, but on the contrary another group thought that they had learned much more than they would have done in the old system. Many saw the cooperation as beneficial for the patients. Most were not satisfied with the actual implementation because rules for the cooperation were changed many times during the process. The average grade for the idea was "9" and for the implementation "5".

**Conclusion:** Letting junior doctors cooperate between specialties can be a success, both medically and socially. However it takes careful planning and well organized implementation to avoid frustrations among the doctors.

## P13

### Clinical signs of bacterial meningitis at admission

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**Introduction:** To identify clinical signs of high sensitivity in adult community acquired bacterial meningitis on the time of admission to a hospital.

**Methods:** All adult cases of culture positive cerebrospinal fluids in East Denmark from 2002 to 2004 were included. Medical records were collected retrospectively with 98.4% case completeness.

**Results:** 132 cases were included. Only 40% had the "typical triad of symptoms" (altered consciousness, fever and nuchal rigidity). 89% had clinically altered consciousness, 77% had fever, 73% had nuchal rigidity, 70% reported headache, 16% reported convulsions prior to admission, 14% had petechiae.

75% had 3 or more of the 6 clinical signs mentioned above.

Petechiae were registered only among meningococcal (n = 11; 61% of cases) or pneumococcal (n = 6; 8% of cases) aetiology.

**Conclusion:** "3 out of 6 clinical cardinal symptoms" was more sensitive in detecting community acquired bacterial meningitis than the "typical triad of symptoms".

## P14

### Admission diagnosis and timing of lumbar puncture in bacterial meningitis

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**Introduction:** To evaluate the possible influence of admission diagnosis and clinical signs on delay in time to lumbar puncture in adult community acquired bacterial meningitis.

**Methods:** All adult cases of culture positive cerebrospinal fluids in East Denmark from 2002 to 2004 were included. Medical records were collected retrospectively with 98.4% case completeness. "Cardinal symptoms" were defined as: altered consciousness, fever, nuchal rigidity, subjective headache, convulsions prior to admission and petechiae.

**Results:** 132 cases were included. Diagnosis at admission included meningitis (39%, n = 50), pneumonia/sepsis (9%, n = 12), acute cerebral vascular disease (10%, n = 13), febrilia (11%, n = 14), confusion/unconsciousness (15%, n = 19), other (16%, n = 21); with median time from admission to lumbar puncture 0.95 hr, 4.5 hr, 3.5 hr, 1.9 hr, 2.3 hr, and 4.15 hr (p < 0.0001 Kruskal-Wallis), respectively. When a minimum "3 out of 6 clinical cardinal symptoms" indicated meningitis, median time to lumbar puncture was shorter (1.0 hr vs 1.9 hr, p < 0.001).

**Conclusion:** Delay in time to lumbar puncture correlated to admission diagnosis and to initial clinical signs.

**P15****Strategies for implementation of public access defibrillation in residential areas: a community based study**

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**Introduction:** Public access defibrillation (PAD) programmes have focused on out-of-hospital cardiac arrests (OHCA) in public though the majority of arrests occur in residential areas. However, knowledge concerning strategic placement of automated external defibrillators (AEDs) in residential areas is lacking.

**Methods:** The Copenhagen Mobile Emergency Care Unit identified all OHCA in Copenhagen from 1994–2005, and data for each cardiac arrest including presumed cause and time of arrest, initial heart rhythm, and location of arrest (private vs. public) were obtained. Demographic characteristics of grid cells (100 × 100 meter areas) were analyzed according to the occurrence of residential OHCA. Each grid cell was assigned to quartiles of population density, household income, average age, and proportion of short education.

**Results:** Of 4828 registered OHCA, 3554 (74%) occurred in residential areas. Compared with OHCA in public, individuals with OHCA in private locations were older (70 vs. 62 years,  $p < 0.0001$ ), more frequently male (76.8% vs. 56.5%,  $p < 0.0001$ ), more often had arrest during night time (21.2% vs. 11.2%,  $p < 0.0001$ ), had higher comorbidity rates, experienced longer response time (6.0 vs. 5.0 min,  $p < 0.0001$ ), were less likely in a ventricular fibrillation (12.8% vs. 38.1%,  $p < 0.0001$ ), and had a lower survival rate (3.2% vs. 13.9%,  $p < 0.0001$ ). Demographic characteristics of grid cells predicted OHCA frequency in residential areas. The rate ratios of cardiac arrest in the lowest compared to the highest quartile was: for population density 8.61 (95% confidence interval (CI) 7.25–10.22), for average age 1.80 (95% CI 1.65–1.95), for household income 0.68 (95% CI 0.57–0.81), and for the proportion of short education 1.94 (95% CI 1.68–2.25).

**Conclusion:** In this community-based study we found important differences in individual OHCA characteristics according to location of OHCA that could explain the poor outcome of OHCA found in private locations. In addition, we found differences of OHCA occurrence according to demographic

characteristics in residential areas. These findings suggest that for the placement of AEDs as part of a residential PAD programme, the population density, average age, as well as the neighbourhood socioeconomic status should be taken into consideration.

**P16****Optimizing treatment of acute patients in a Danish Emergency Department**

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**Introduction:** The aim of this study was to observe and characterize the organization and quality of the treatment from a patient's point of view in a Danish Emergency Department.

**Methods:** The study is based on observations and data was conducted November 2008. Fifteen patients were included whereas five were stratified as medical patients, five were orthopedic and five were general surgical patients. There were nine male and six female patients with an age range of twenty-seven to ninety-one years. A neutral observer followed the patients with a semi structured observational method from arrival at the Emergency Department to the point of discharge aiming to clarify the process.

**Results:** The study identified that the different trade groups worked separately and the coordination of the patient treatment took place outside the trauma room thus resulting in an inadequate delivery of information between staff-members. In addition decisions made by one part of staff often got overruled by another, as the case is for visitation, and the trade groups has separate documentation forms. The doctor was often interrupted during one process having to relate to another before being able to proceed. Inexperienced doctors are in lack of guidance and the doctors in general have difficulties getting assistance from nurses. The patient is averagedly seen fifteen minutes after arrival by one from the nursing staff and within an average of forty-two minutes by a doctor. The doctors specializing in internal medicine saw the patient faster than the surgeons. Fourteen out of fifteen patients were sent home or to another medical profession within four hours. The patients expressed general satisfaction, no waiting time and where content with the information level.

**Conclusion:** If the key for development of an effective Emergency Department is taking care of the whole patient, it seems crucial to establish cross-functional teams with full utilization of the doctors' and nurses' respective competences as well as a tool compiling all the documentation gathered around one patient. If possible the decisions about treatment and further care should be made with the patient and nursing staff present to achieve the highest possible understanding of the patient's situation.