Retrospective review of patients presenting between 01/08 and 09/08, to an urban tertiary care emergency department (50,000 patients/year). Patients with a presumed diagnosis of septic shock requiring vasopressors were divided, based on initial lactate, to low (0-2.4), intermediate (2.5-3.9) and high (4.0 and higher) lactate groups. We used descriptive statistics to report the data and chi-squared or t-test as appropriate to compare groups.

**Results:** A total of 138 patients with vasopressor-dependent shock were enrolled. Of these, 64/138 (46%) were non-lactate expressors (low lactate levels), and 54% of the population were lactate expressors, with 33/138 (24%) in the intermediate elevation group and 41/138 (30%) in the high lactate group. The 28-day mortality increased significantly with increasing lactate levels, and 54% of the population were lactate expressors, with 33/138 (24%) in the intermediate elevation group and 41/138 (30%) in the high lactate group. The 28-day mortality increased significantly with increasing lactate with 19%, 30%, and 44% mortality within the low, intermediate, and high lactate group respectively (p = 0.021). Acute liver failure statistically correlated with higher lactate levels with 4% (5/143), 16% (41/253) and 34% (15/41) prevalence as the lactate group increased from low, intermediate to high (p < 0.001). Similarly, liver disease and liver enzymes trended in the same direction. Bacteremia increased significantly between lactate groups with 9% (6/64) in the normal lactate, 15% (5/33) in the intermediate lactate and 34% (14/4) in the high lactate group having positive blood cultures (p = 0.005).

**Conclusions:** Patients in septic shock often do not have an elevated lactate, and still face significant mortality. Although elevated lactate levels are associated with increased mortality in sepsis, not all patients with septic shock express lactic acidosis. The objective of this study was to determine the proportion of patients in vasopressor-dependent septic shock who presented with and without lactic acidosis. Secondarily, we sought to determine patient characteristics that differentiated lactate expressors and non-lactate expressors.

**Hypothesis:** Patients in septic shock often do not have an elevated lactate, and still face significant mortality.

**Methods:** Retrospective review of patients presenting between 01/08 and 09/08, to an urban tertiary care emergency department (50,000 patients/year). Patients with a presumed diagnosis of septic shock requiring vasopressors were divided, based on initial lactate, to low (0-2.4), intermediate (2.5-3.9) and high (4.0 and higher) lactate groups. We used descriptive statistics to report the data and chi-squared or t-test as appropriate to compare groups.

**Results:** A total of 138 patients with vasopressor-dependent shock were enrolled. Of these, 64/138 (46%) were non-lactate expressors (low lactate levels), and 54% of the population were lactate expressors, with 33/138 (24%) in the intermediate elevation group and 41/138 (30%) in the high lactate group. The 28-day mortality increased significantly with increasing lactate with 19%, 30%, and 44% mortality within the low, intermediate, and high lactate group respectively (p = 0.021). Acute liver failure statistically correlated with higher lactate levels with 4% (5/143), 16% (41/253) and 34% (15/41) prevalence as the lactate group increased from low, intermediate to high (p < 0.001). Similarly, liver disease and liver enzymes trended in the same direction. Bacteremia increased significantly between lactate groups with 9% (6/64) in the normal lactate, 15% (5/33) in the intermediate lactate and 34% (14/41) in the high lactate group having positive blood cultures (p = 0.005).

**Conclusions:** Patients in septic shock often do not have an elevated lactate, and still face significant mortality. Although elevated lactate levels are associated with increased mortality in sepsis, not all patients with septic shock express lactic acidosis. The objective of this study was to determine the proportion of patients in vasopressor-dependent septic shock who presented with and without lactic acidosis. Secondarily, we sought to determine patient characteristics that differentiated lactate expressors and non-lactate expressors.
Background: Acute chronic obstructive pulmonary disease (COPD) exacerbation is a serious condition with a mortality of 10%, and the condition often requires treatment with antibiotics. The aims of the study were 1) to evaluate which antibiotics, the physicians prescribe in first line treatment to patients with acute COPD exacerbation, and 2) to compare the given treatments with national guidelines.

Methods: The study included 100 randomly selected patient charts; 25 from each of the 4 emergency wards in Region Sjælland (Køge, Slagelse, Nyköbing Falster and Holbæk). Data were collected retrospectively from electronic charts in the period August-December 2009.

Inclusion criteria were COPD patients older than 18 years with acute exacerbation of COPD, need for antibiotics, no concurrent treatment with chemotherapy or immunosuppressive drugs admitted to the emergency wards. The national guidelines included guidelines from the Danish Society of Respiratory Medicine, Medicin.dk, Institute for Rational Pharmacotherapy and the Danish College of General Practitioners.

Results: The study showed that cefuroxime, benzylpenicillin and amoxicillin in combination with clavulanic acid were the most frequently used antibiotics for the treatment of acute COPD exacerbation. In total, 82% of the patients received intravenous antibiotic treatment exclusively. Of these patients, 73% were treated with cefuroxime and 27% with benzylpenicillin. Oral antibiotics were used in 17% of the patients. Of these, 88% were treated with amoxicillin in combination with clavulanic acid and 12% with phenoxymethylpenicillin. One patient was treated with cefuroxime in combination with oral azithromycin.

The national guidelines recommend cefuroxime as first choice drug in hospital treatment of acute COPD exacerbation. Conclusion: Cefuroxime was the most commonly used antibiotic in the treatment of acute COPD exacerbation. According to national guidelines, benzylpenicillin is not recommended for the treatment of acute COPD exacerbations. However, this antibiotic was used in 27% of the patients. Consequently, the results indicate a need for a regional guideline composed in cooperation with specialists in Infectious Disease, Clinical microbiology and Pulmonary disease. This will help the physicians choosing the right treatment, and contribute to standardized treatment of patients with acute COPD exacerbation in Region Sjælland.
this communicative tool can improve diagnostics and referral in the emergency department.

**P3**

**Are watches in the ambulances and the Emergency Department synchronized?**

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**Background:** Prognostication in patients with cardiac arrest (CA) is (amongst other things) dependent on the duration of the CA. However in patients with out-of-hospital CA, the patient is often handed over from the ambulance crew to hospital staff. During the hand-over ambulance crews often present a printed summary of events during the resuscitation attempt from the defibrillator.

As treatment for the CA is started in the prehospital phase, the hospital staff needs reliable information on the duration of the CA in order to prognosticate the patient properly. It is therefore important that the ambulance crew and the hospital staff use watches that are synchronized. Unsynchronized watches can lead to both over and underestimation of the duration of the CA.

The aim of our study was to examine if the watches in defibrillators in ambulances were synchronized with the wall mounted clocks at Emergency Departments (ED).

**Methods:** Using a laptop computer with a wireless connection to the internet, we synchronized the watch with an atomic clock (http://time.gov). We then compared the reading of this clock with the wall mounted clocks in the rooms most often used for resuscitation at the Emergency Departments at Sydvestybsk Sygehus Esbjerg and Kolding Sygehus. We also compared the watches in the defibrillators of a convenience sample of ambulances in both Esbjerg and Kolding with the atomic clock.

Deviation from the atomic clock was calculated in seconds and is presented as median (IQR).

**Results:** There were two watches in the resuscitation rooms in the ED in Kolding, both were exactly on time. We examined the defibrillator in seven ambulances in Kolding and found a median deviation of 45 seconds (1-102). In Esbjerg the watches in the resuscitation rooms in the ED were a median 150 (120-180) seconds ahead of the atomic clock. In the ambulances in Esbjerg the defibrillators were a median 252 (97-315.5) seconds ahead.

**Conclusion:** We found a maximum deviation between the watches in defibrillators in ambulances and wall mounted clocks in the ED’s of approx. 7.5 minutes. However most deviations were minor and would probably have no significant impact on prognostication of the individual patient.

**P4**

**Can unannounced simulated cardiac arrest reduce pauses in chest compressions and time to defibrillation?**

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**Background:** The quality of resuscitation during cardiac arrest in hospital is often suboptimal and there is need for continuous improvement of education. Standardized simulation-based training is proposed as a mean to ensure a consistent and high level of competence among hospital staff, but it is costly and requires frequent recertification. Successful resuscitation is dependent on teamwork and it is a challenging task to train cardiac arrest teams (CAT) as a unit because they consists of varying people.

The purpose of this pilot study is to investigate whether unannounced simulated cardiac arrests in hospital departments can reduce pauses in chest compressions and time to defibrillation.

**Methods:** This is a prospective intervention study with historical controls. Data on cardiac arrest treatment have been collected prospectively from defibrillators before the intervention was started and will be used as controls for comparison with data collected after the intervention. Data collection will stop when the ILCOR 2010 guidelines are published. Code Stat 8.0 (Medtronic, Physio Control) is used to collect data from LifePak 12/20 defibrillators (Medtronic®). A Resusci Anne Simulator (Laerdal Medical®) is used to perform the simulations and to record data concerning chest compression and defibrillation. After preparing the equipment, the ward staff is informed that there is a critical ill patient on the ward and instructed to act as in a real clinical situation.

The scenario develops into cardiac arrest and the unaware CAT is called. When they reach the room the team is instructed to start treatment as usual (ILCOR 2010 guidelines).

After the simulation, a short debriefing of all participants is conducted with focus on pauses in chest compressions and time to defibrillation.

**Results:** Data from before intervention, during simulations and post simulation will be presented. Data on pauses in chest compressions and time to defibrillation in the pre-analysis and post-analysis group will be compared statistically. Furthermore data from the simulations will be analysed separately.

**Conclusion:** Data collection has begun. We think that unannounced simulated cardiac arrest can reduce pauses in chest compressions during cardiac massage, and reduce time to defibrillation and thereby improve the quality of resuscitation.

**P5**

**Communication between doctors and nurses in the emergency department**

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**Background:** It is experienced in emergency department waiting time to a course of treatment becomes longer due to lack of communication and patient planning. By optimizing the communication between doctors and nurses the waiting time for patients can maybe be reduced.

The emergency department triage patients in category 1 to 5. Category 1 is most emergent. We selected two patient groups, category 3 and 4.

**Methods:** Phase 1: Processing time for category 3 and 4 patients will be determined and form the basis for the project and will then be used as the effect of the project. To get an insight into the current workflow there is made observations and interviews with doctors and nurses on the ward.

Phase 2: More concrete observation and interview points are made to focus on the most important elements to improve the workflow. The implementation is a communication guide is used by all nurses and doctors in treatment in the emergency department. The implementation phase with the intervention takes place in one month and then data acquisition for 7 days.

**Results:** Out of the 220 patients, 126 patients were not triaged. The average processing time for Category 3 and 4 patients was respectively, 109,5 minutes (n = 54, 95% conf.limit 104,3-139,8) and 99,0 minutes (n = 40, 95% conf.limit 89,2-132,6). These two groups do not differ significantly.

We observed lack of initial dialogue between doctors and nurses about the patient and lack of planning for patient treatment. Practical chores as i.v. access, ordering venous and arterial blood samples and urine samples were deferred to the end of treatment resulting in prolonged treatment time. From the interviews there was a desire for better and more detailed oral report on the patient to form the best basis for treatment.

Furthermore, there was a desire for optimized teamwork around the patient for better sharing of common tasks.

**Conclusion:** The project is still ongoing and after phase 1, we note that areas such as communication between doctors and nurses initially in the
Coping with syncope in the emergency department

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Background: Syncope is frequently seen in the Emergency Department (ED) and is a cause for numerous hospitalizations. Focusing primarily on syncope, the aim of this study was to determine the frequency and the underlying causes of transient loss of consciousness in patients seen in the ED. Furthermore, the aim was to identify the indications for admittance and discharge of patients with syncope after the primary evaluation was performed in an ED that does not have syncope guidelines.

Methods: This study was performed during a two week period, where data was registered on patients presenting themselves with transient loss of consciousness in the ED, Holbæk Hospital.

Results: Following the primary evaluation in the ED, 21 patients were seen in the ED with transient loss of consciousness. One patient was excluded due to reoccurring non-transient loss of consciousness. Half of the study population was hospitalized, and the other 50% were discharged with the most frequent presumptive diagnosis being vasovagal syncope. Diagnostic outcome in the study population showed that 15 patients had benign causes of syncope, 2 patients had suffered cardiac syncope, 4 patients had near-syncope, and 1 patient had a TCI. None of discharged patients were readmitted within a 3 week follow-up period and no adverse events were observed. Median age amongst inpatients was 76.5 years (range 25-89) and 59.5 years for outpatients (range 10-89). Inquiry about cardiac symptoms prior to syncope was performed amongst 70% of the inpatients and 50% of the outpatients respectively. There were abnormal ECG findings in 40% of the admitted patients and none amongst the outpatients. No significant difference concerning prodromes and co-morbidities was found in inpatients versus the outpatients. The average admittance time was 2 days (range: 1-23).

Conclusion: This prospective study confirmed that syncope is a common cause for transient loss of consciousness generating many costly admissions and investigations. Indications for admission were undetermined syncope and suspicion of cardiac syncope. It is plausible that syncope evaluation in the ED may be facilitated and admissions may be reduced by using syncope guidelines and risk stratification models.

Current use of intraosseous infusion in Danish emergency departments

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Background: We have evaluated the current use of intraosseous infusion (IOI) in Danish emergency departments. The use of IOI is recommended when intravenous access cannot be readily established in both paediatric and adult resuscitation.

Methods: A questionnaire was distributed to 20 emergency departments. The response was made by the physician in charge of the IOI-material. We received 18 replies and status. Vital signs were written on a piece of paper, changing as the scenario progressed. The teams were instructed to act as they would in a real clinical situation, e.g. talk to the patient and the team and to carry out relevant procedures. After finishing the scenario five minutes were used for debriefing of the team.

Results: 12 nurses and 12 junior physicians had basic team training in a simulated clinical situation, while a similar number of staff observed. All active participants found the training highly valuable. The training also revealed that some essential utensils and medications for resuscitation were too far away from the regular ED room. Hence, part of the ED was reorganized on the basis of these observations.

Conclusion: Basic medical team training can be carried out without advanced equipment and with no cost if fitted into the daily programme. It is also a valuable way to test the equipment and physical set-up of the ED.

Free medical team training

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Background: Medical simulation and team training is widely used and the effect on learning is generally accepted. However, full scale simulation is expensive and time consuming. Mornings in the Emergency Department (ED) are often quiet leaving time for other activities. The trauma teams are well organized, and they participate in team training regularly. In contrast, even though medical and surgical patients are often at least as complex as trauma patients, they are managed only by a few nurses and a junior physician, and the team work is rarely trained.

We wanted to test the feasibility of a simple and costfree setup, aimed at increasing the teamwork abilities of our staff.

Methods: The training was organized by two junior physicians, both ALS provider trained, and a nurse specialist, ATCN educated. It took place in a regular ED room with a simple CPR manakin torso.

On three separate days, two teams consisting of 2 nurses and 2 junior physicians from the ED were selected. The two teams went through a scenario from 8.30 to 9.00 am, and from 9.00 to 9.30 am, respectively. The organizing physician explained the scenario and gave information about the manakin’s reply and status. Vital signs were written on a piece of paper, changing as the scenario progressed. The teams were instructed to act as they would in a real clinical situation, e.g. talk to the patient and the team and to carry out relevant procedures. After finishing the scenario five minutes were used for debriefing of the team.

Results: 12 nurses and 12 junior physicians had basic team training in a simulated clinical situation, while a similar number of staff observed. All active participants found the training highly valuable. The training also revealed that some essential utensils and medications for resuscitation were too far away from the regular ED room. Hence, part of the ED was reorganized on the basis of these observations.

Conclusion: Basic medical team training can be carried out without advanced equipment and with no cost if fitted into the daily programme. It is also a valuable way to test the equipment and physical set-up of the ED.

Do acutely admitted medical patients comply with the Appropriateness Evaluation Protocol?

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Background: The majority of medical patients are admitted unplanned and increasingly more patients are admitted to medical departments. But are these admissions all relevant? The Appropriateness Evaluation Protocol (AEP) is an international renowned scoring system that can be used as a marker for the relevancy of unplanned admissions.
Our aim was to clarify how large a proportion of the acutely admitted medical patients at our hospital that comply with the AEP criteria.

**Methods:** All patients admitted from October 2nd 2008 to February 19th 2009 were prospectively included. Only patients immediately transferred to a hospital with a higher level of care were excluded. Upon arrival a nurse registered vital signs and a doctor completed a form on the AEP criteria. Blood tests and information regarding treatment were extracted from the hospital computer systems.

In case of missing information we performed a review of the admission notes and the nurse’s notes. In spite of this, we have missing information on EKG in 1,180 patients and fever for more than five days in 166 patients.

Data are presented as median (IQR) or proportion. Differences in groups are analyzed using Chi-squared or Wilcoxon Rank-Sum test.

**Results:** A total of 3,050 patients were included. 1,463 female (48.0%), median age 66 years (IQR: 50-77). Median length of stay 28 hours (IQR: 12-121), 84 patients died (2.8%).

1,889 complied with the AEP criteria (62.2%), 51.1% in cardiology and 67.7% in internal medicine (p < 0.001). There were no difference on the proportion on different days (p = 0.22), but a small variation on time of day (p < 0.05). Among patients admitted for more than 48 hours, 75.5% complied with the AEP criteria, but among patients discharged before 48 hours, 52.0% complied (p < 0.001).

Patients complying with the AEP criteria had a significantly higher in-hospital mortality, longer admission, increased risk of re-admission within 30 days after discharge and increased risk of mortality within 30 days after discharge.

**Conclusion:** Our data show that acutely admitted medical patients complying with the AEP criteria had a higher mortality, were admitted longer and were readmitted more frequently than patients not complying.

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**P11 Efficient guidelines support professionalism**

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**Background:** Within the last years departments of emergency medicine have been implemented in Denmark. This process has changed focus on the discipline of acute medicine. Due to the composition of the national postgraduate educational system, our department has a high turnover of young doctors. To avoid oscillations in professional performance of our department, we have to improve, test and implement clinical aids. Efficient guidelines supporting the initial receiving process of patients is one of our intervention strategies. Usually clinical guidelines are based on diagnoses and are focused primarily on an academic description. This study introduces guidelines which are based on immediate symptoms and comprise initial evaluation and treatment along with communication, logistics and flow in order to support the initial clinical performance at the bedside.

**Methods:** In context of evidence based evaluation, treatment and communication concerning the emergency patient, and with the clinical symptoms as index, the guidelines are structured using four essential time intervals: The pre-arrival period, the first 5 minutes, the first 15 minutes and the first hour. For each time interval clinical goals are outlined. Ten scenario simulations are carried out for testing the usability of the specific guideline using young doctors and permanent staff members. Scenarios are rated before and after introduction of the specific guideline using standardized marks for academic, communicative, and logistic skills.

**Results:** The clinical performance is improved in all scenarios after implementation of the specific guideline. In the academic level there is an obvious tendency for more than 50% improvement. Communication within the team members and the logistic flow are also improved in more than 80% of the cases. Furthermore the participants’ rating of their own performance increases in average from 4 to 8 on visual analogue scales.

**Conclusion:** Despite being a small pilot study that can be biased from several factors, it strongly indicates that redesigning clinical guidelines can improve the bedside performance considerably. These results have increased our incentive to continue the creation of symptom specific guidelines. We found a great benefit of testing guidelines in scenario simulations before implementation, and so this will be our future strategy.
The introduction of EM departments in Denmark is part of a national strategic decision to focus on the hand over from primary to secondary health care sectors. This shift has raised a lot of skepticism according the quality of service. We feel that data to elucidate the pros and cons of the EM strategy is needed. We present the current results from the EMD in Nykøbing Falster, Denmark.

Methods: The design is an intervention study with a historical control group. All patients admitted to our institution under the diagnosis of stroke during 2008 and 2009 were included. The intervention group consisted of the patients admitted during 2009. The controls where the patients from 2008. Inclusion criteria and data collection according to the NIP standard.

The intervention started April 1st 2009 when the EMD was opened i.e.: Implementation of the NIP standard as part of the EM department systematic approach. The control group was treated with reference to the same standard under a Internal medicine approach.

Results: The rate of patients who had all process indicators positive according to the standard went from 5% (2-9) to 32% (21-43) (highest regional score) (rate, 95% cofidense interval) and we achived the best regional outcome for stroke patients as indicated by odds ratio for survival within three months.

Conclusion: The Emergency Medicine paradigm has the time factor imbedded in a way that is beneficial for the provision of medical services according to standards where time is high priority. As EM departments are established, nationwide, a quality improvements should be expected - at least for stroke management according to NIP.

P13

Emergency physicians are more accurate in detecting pulmonary embolism at the emergency department than internal medicine physicians

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Background: Detecting pulmonary embolism (PE) is a major problem at the ED. Final diagnosis often is made by CT-scan. Due to specialisation in emergency medicine emergency physicians might perform better than internal medicine physicians in detecting PE. To confirm this hypothesis, a single center retrospective cohort-study was performed.

Methods: During the three-month periods (march till may) 2007 and 2008 the findings in all patients undergoing pulmonary CT at our emergency department were reviewed. The investigations were attributed to emergency physician (EP) or internal medicine physician (IP). Negative and positive investigations were evaluated, and the number of patients treated by the respective group were calculated. Statistical analysis was performed by the Students-T-test, and probability levels of 5% were accepted as significant.

Results: In 2007, a total of 2847 patients attended for medical problems. 576 were treated by EP (20.23%). In 2008, 2408 patients searched for medical problems and 625 (25.95%) were attended by EP. EP ordered a total of 34 pulmonary CT 2007 and 35 in 2008. 17.64% (2007)/22.86% (2008) of these resulted in the diagnosis of PE. IP ordered a 77 (2007) and 64 (2008) pulmonary CT, with positive findings in 12.98% (2007)/ 10.93% (2008). EP ordered pulmonary CT for 5.9% (2007)/5.6% (2008) of their patients, whilst IP performed CT-scans in 3.39% (2007)/3.59% (2008) (p = 0.0108). This means that EP have a higher index of suspicion for the diagnosis of PE at the emergency department (1.74 (2007)/1.56 (2008). (p = 0.0108). This means that EP have a higher index of suspicion for the diagnosis of PE at the emergency department (1.74 (2007)/1.56 (2008). CT-scans were positive in 1.04% (2007)/1.28% (2008) for the EP, and in 0.43% (2007)/0.39% (2008) for the IP (p < 0.01). EP are more accurate in detecting PE at the emergency department (OR 2.43(2007)/3.26(2008).

At the hospital including the emergency department were 14.29% (2007)/14.15% (2008) of CT-scans positive. No significant difference could be found between the positive findings for all the hospital compared to the EP (p = 0.38) or IP (p = 0.27).

Conclusion: Emergency physicians seem to have a higher index of suspicion for PE than internal medicine physicians and are more accurate in detecting PE at the emergency department. Compared with the total of our university hospital, emergency physicians are at least comparable in diagnosing PE.

P14

Horseback riding accidents in Iceland 2000-2008

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Background: Horseback riding is a popular hobby in Iceland as it is in the other Nordic countries but has a relatively high frequency of injuries. The estimated mortality related to horseback riding injuries is 1/10,000 riders per year. We set out to evaluate the mortality and morbidity of horseback riding injuries presenting to the emergency department in Landspitali university hospital, Reykjavik, Iceland.

Methods: We looked at the demographic characteristics of all patients presenting to our department for horseback riding related injuries during the years 2000-2008. We evaluated injury pattern and severity using AIS and ISS scores. We further registered number of surgical procedures, length of stay, stay in ICU for all patients presenting 2003-2008 and mortality for the period 2000-2007.

Results: During the study period 1849 patients presented to the emergency department in Landspitali university hospital, Reykjavik, Iceland for horseback riding related injuries. 1085 were women (58.7%) and 764 men (41.3%). The most frequent age-group for women was 15-19 years compared with 40-44 years for men. A total of 191 (10.3%) patients were admitted for their injuries. The average ISS score for those admitted was 7.7. Most patients presented during the weekends and in the months of march, april and may. The most common body areas injured were lower extremity including pelvis 40%, head 16% and upper extremity 14%. The average lenght of stay for those admitted was 3.0 days, 8% were admitted to the ICU and about half of the patients needed one or more surgical procedures. The accident related mortality was around 0.5% in our study.

Conclusion: Horseback riding accidents are about three times more common than motorcycle accidents per hour ridden according to our study. The accidents are serious with a high ISS score and mortality rate compared to other non-motorsport related injuries. It appears that increased emphasis need to be put on preventive measures to decrease the mortality and morbidity of this popular hobby.

P15

Improved mortality after STEMI over two decades

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Background: Over the past two decades the treatment of ST-elevation myocardial infarction (STEMI) has changed significantly. We set out to investigate the effect of these changes on one-year mortality from STEMI.

Methods: Data was collected on all hospital admissions for STEMI in Reykjavik, Iceland during the calendar years of 1986, 1996 and 2006. Patients were followed for one year regarding all cause death and hospital readmission for cardiac causes. The outcome was related to changes in the use of reperfusion strategies and medication at hospital discharge.

Results: A total of 335 patients in 1986, 351 in 1996 and 178 patients in 2006 comprise the total study population of 864 STEMI patients. In addition 25 (6.9%) patients died within the first 24 hours of hospital admission in 1986, 33 (15.6%) in 1996 and 5 (2.7%) in 2006. One-year mortality decreased from 26.3% in 1986 and 19.7% in 1996 to 12.9% in 2006 (p = 0.001). Cox proportional hazard analysis showed aspirin (HR 0.29), the use of reperfusion therapy (HR 0.51) and beta blockers at
Background: The reduction in 1-year mortality after myocardial infarction during the last two decades is explained by improved medical management with aspirin, beta blockers and aggressive reperfusion therapy. Diuretic therapy, reflecting congestive heart failure, and increased age have negative effects on survival.

**Conclusion:** The reduction in 1-year mortality after myocardial infarction was explained by improved medical management with aspirin, beta blockers and aggressive reperfusion therapy. Diuretic therapy, reflecting congestive heart failure, and increased age have negative effects on survival.

Methods: The study was a retrospective evaluation of patients treated for myocardial infarction at the hospital in the period 2010-2012. The variables were age, gender, presence of diabetes, previous myocardial infarction, PCI, IV, and mortality. The study was approved by the local ethics committee.

Results: A total of 100 cases (20 consecutive cases triaged by each nurse) were included. The hospital discharge (HR 0.53) to be the strongest factors to explain the mortality reduction while the use of diuretics (HR 1.42) and age (HR 1.06) were related to increased one year mortality.

**Conclusion:** The reduction in 1-year mortality after myocardial infarction was explained by improved medical management with aspirin, beta blockers and aggressive reperfusion therapy. Diuretic therapy, reflecting congestive heart failure, and increased age have negative effects on survival.

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**P16**

**Inter-observer variation in the triage-process**

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**Background:** Triage algorithms for sorting patients according to their severity of illness have recently been implemented at several emergency departments in Denmark. Clinical effectiveness and safety depend on standardization of the triage process. We implemented a 5-level triage algorithm for which triage nurses underwent an initial training. The aim of this study was to evaluate the degree of standardization in implementation of triage by measuring the level of agreement among retrospective reviewers of the triage scores.

**Methods:** Six months after implementation, we studied the inter-observer variation among our 5 triage nurses. Cases triaged by each nurse underwent two separate retrospective evaluations by all 5 triage nurses based on documentation of a) pre-arrival information, and b) pre-arrival information plus triage vital signs and clinical information gathered on arrival. Kappa-statistic was used to evaluate pair-wise agreement among the retrospective reviewers for each of the two retrospective evaluations, and also between the original triage score and second retrospective review.

**Results:** A total of 100 cases (20 consecutive cases triaged by each nurse) were evaluated. The distribution of initial triage scores was 1 red (highest acuity), 27 orange, 48 yellow, 24 green, zero blue (lowest acuity). Weighted kappa-score for pair-wise agreement among triage nurses for the two retrospective reviews were 0.40 (range: 0.24-0.56), and 0.41 (range: 0.38-0.46). Weighted kappa-score for pair-wise agreement between original triage score and each retrospective reviewer (pre-arrival information + triage vital signs and clinical information) was 0.45 (range: 0.34-0.58).

**Conclusion:** These results show, for the first time in Denmark, that moderate agreement can be achieved within a short period of time following implementation of an emergency department triage program with a brief initial training. A limitation of this study is that we did not systematically evaluate the completeness of the clinical documentation upon which the retrospective triage evaluations were made. Variability in the completeness of the clinical documentation may contribute to variability in the scoring. Quality assurance feedback and continuing triage nurse education are indicated to improve the standardization of triage scoring.

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**P17**

**Intervention to improve screening and treatment of sepsis**

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**Background:** Audits have elucidated that sepsis is a frequent cause of death in the hospitals of Region of Zealand. International studies have shown that the survival of sepsis can be increased by introducing a "standard-package" containing 6 elements, for screening and treatment. Therefore, it was decided that all departments in the region have to implement a regional guideline for sepsis. Acute Division in Nykøbing F. has studied whether a systematic way to implement this guideline, will increase the number of patients, who receive a proper screening and treatment.

**Methods:** The project demonstrated that a systematic process with several simultaneous actions has an increase in the awareness of sepsis although not to full extent. In addition, screening and treatment of sepsis were improved. A subsequent follow-up will show whether mortality (HSMR) has declined with the introduction of the regional guideline on sepsis.

**Conclusion:** The project demonstrated that a systematic process with several simultaneous actions has an increase in the awareness of sepsis although not to full extent. In addition, screening and treatment of sepsis were improved. A subsequent follow-up will show whether mortality (HSMR) has declined with the introduction of the regional guideline on sepsis.

**Results:** Of the staff, 78% received formal education. Six months after implementation, we studied the inter-observer variation among our 5 triage nurses. Cases triaged by each nurse underwent two separate retrospective evaluations by all 5 triage nurses based on documentation of a) pre-arrival information, and b) pre-arrival information plus triage vital signs and clinical information gathered on arrival. Kappa-statistic was used to evaluate pair-wise agreement among the retrospective reviewers for each of the two retrospective evaluations, and also between the original triage score and second retrospective review.

**Results:** A total of 100 cases (20 consecutive cases triaged by each nurse) were evaluated. The distribution of initial triage scores was 1 red (highest acuity), 27 orange, 48 yellow, 24 green, zero blue (lowest acuity). Weighted kappa-score for pair-wise agreement among triage nurses for the two retrospective reviews were 0.40 (range: 0.24-0.56), and 0.41 (range: 0.38-0.46). Weighted kappa-score for pair-wise agreement between original triage score and each retrospective reviewer (pre-arrival information + triage vital signs and clinical information) was 0.45 (range: 0.34-0.58).

**Conclusion:** These results show, for the first time in Denmark, that moderate agreement can be achieved within a short period of time following implementation of an emergency department triage program with a brief initial training. A limitation of this study is that we did not systematically evaluate the completeness of the clinical documentation upon which the retrospective triage evaluations were made. Variability in the completeness of the clinical documentation may contribute to variability in the scoring. Quality assurance feedback and continuing triage nurse education are indicated to improve the standardization of triage scoring.

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**P18**

**Journal Club for Nurses**

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**Background:** The vision of the Emergency Department of Nykøbing is to create a department with a high professional standard, and to be known for their prioritization of research and development. To support the Emergency Department’s vision, it has been decided to establish a Journal Club for Nurses.

**Methods:** The nurse’s competencies and knowledge about using literature based on research, was examined through an anonymous questionnaire. The purpose was to identify the nurse’s competencies and knowledge about evidence-based medicine and evidence-based nursing. A steering committee with representatives from the department’s leadership and the clinical specialist has been collected. They choose the topics from clinical practice and arrange the meetings.

**Clinical guidelines has been developed for The Journal Club with descriptions of purpose, structure and the frames for the organization of the Journal Club. Also there has been collected relevant literature on critical article-reading and research-designs.**

A repetition of the questionnaire to study the effect of Journal Club has been scheduled after one year.

**Results:** The questionnaire showed that 89% of the nurses were reading professional literature about nursing. Thereof did 83% primarily read in the Danish nursing-magazine “Sygeplejersken”. The questionnaire showed that 22,5% have knowledge of, or use searching on databases such as Pubmed, Cochrane, Cinahl. 61% of the nurses have knowledge of quantitative research. Thereof, 22,5% of the nurses knows about one or more research methods within the quantitative research tradition.

58,7% has knowledge about qualitative research. Thereof, 22,8% has knowledge of one or more research methods. There has been held two Journal Clubs for Nurses, and there has been a great support and interest in participating. The evaluation has shown that all participants think that especially the professional discussion after the presentation is valuable. 83% of the participants think that their participation in The Journal Club has an affect to their clinical practice.

**Conclusion:** Journal Club for Nurses is a success, because the nurses believe they’re increasing their competence through participation. At
present don’t have data to document a change of culture or an increased competence of the nurses, but we have created a valuable space for nurses’ professionalism in emergency department.

P19

Laboratory sampling according to triage - how much does it cost?

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Background: METTS has been shown to be a triage-system reducing mortality at the emergency department. It was stated that point-of-care-analysis of standardized laboratory samples in triage systems could reduce the costs for single patients. In this single centre study, we controlled if the costs for single patients at the emergency department could be reduced by standardized sampling according to METTS without point-of-care analysis.

Methods: METTS was introduced as the triage system at our university hospital. The triage followed a standardized system following a user’s guide, and standardized laboratory sample packages were created and taken accordingly. In contrast to the original concept using point-of-care-analysis, the samples were sent to the hospitals central laboratory. The total costs for laboratory analysis during a three months period after the introduction of METTS at our emergency department were compared to their historical controls. The number of patients attended and the total costs for laboratory analysis were calculated according to the hospitals computerized attendance and accounting systems. Statistical analysis was performed using the unpaired two-tailed Student’s T-test.

Results: A total of 9000 patients were attended from December 2008 to februari 2009 (period 1) and 8553 patients from December 2009 to februari 2010 (period 2, p = 0.39). Total costs for laboratory analysis was 439.3 ± 53 TSKR in period 1 and 670 ± 21.6 TSKR in period 2 (p = 0.0019). Mean laboratory costs per patient were 145.67 ± 7 TSKR in period 1 and 235.33 ± 5 TSKR (p < 0.0001) in period 2, i.e. +61.55%.

Conclusion: The introduction of standardized laboratory analysis using the hospitals central laboratory instead of point-of-care-systems results in significant increase of costs. Economically, the use of standardized sampling coupled to primary triage without point-of-care-analysis should be discouraged.

P20

Level of undertriage in a well established Trauma Registry in Denmark

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Background: It is universally accepted that patients suffering major trauma, may need a high level of immediate care on arrival at hospital to secure the best outcome. Triage is the allocation of injured patients to a suitable treatment level, and is also at our hospital based on a set of criteria which is based on pre-hospital values and findings. The trauma registry at Odense University Hospital (OUH), which registers the hospitals’ admitted trauma patients, was established in 1996. Previously no studies have been done for this registry. Our aim was to assess the amount and character of undertriage and estimate the level of overtriage.

Methods: Retrospective analysis of data collected from OUHs list of patients admitted with ICD S- and T diagnoses in 2007. Inclusion criteria were ISS > 15, treated in intensive care unit > 2 days, dead within 30 days, or proximal penetrating injury. Overtriage was identified from the trauma registry of patients received by the trauma team, where the severely injured patient was defined as having ISS > 15.

Results: Potential undertriage if all inclusion criteria were followed was 22%. Undertriage if only ISS-score is used is 10%. Women had a higher risk of undertriage than men, and undertriage patients were significantly older than correctly triaged patients. We discovered a high frequency of falls from low heights in undertriage patients. 628 patients were admitted by the trauma team, with an overtriage of 86% assessed by ISS-score.

Conclusion: We found an undertriage proportion comparable to similar studies. Elderly patients and women had a higher risk of undertriage, which also has been found in other studies. We suggest that research should be concentrated on the reasons for this. We also found that if all inclusion criteria are used uncritically, it might overestimate undertriage. However, we suggest further research into whether the elderly and comorbid could reap benefit from medical participation early in the treatment process of even minor trauma.

P21

Mortality following acute medical hospitalization in Denmark - a population-based cohort study

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Background: The age of the general population is increasing: It is estimated that the population aged above 65 years will increase by 400,000 over the next 30 years. A third of this increment is comprised by persons older than 80 years. 45% of the general population and 68% of the population aged above 65 years have at least one chronic disease. Thus, aging of the population is expected to cause an increase in morbidity and an increase in number of hospitalizations. The increasing number of hospitalizations will therefore involve an increasing number of patients with more than one chronic disease. The aim was to examine 1-, 3- and 6-month mortality after acute medical hospitalization according to sex, age, and comorbidity.

Methods: Using data from the Danish National Registry of Patients, we conducted a population-based cohort study including all patients with an admission in 2008 to the Medical Admission Unit (MAU) at Aarhus University Hospital-Nærbrogade. Only first-time admissions were included. The patients were followed until death, emigration, or 6 months after date of admission using data from the Civil Registration System. Using discharge diagnoses registered before 2008, we ascertained comorbidity and defined three levels of comorbidity index-score (low, medium, high). We examined mortality according to sex, age and comorbidity.

Results: We identified 4,494 patients with a first-time admission in 2008 to MAU, 3,768 (84%) were classified as acute, 252 (6%) as non-acute, and 474 (11%) were unclassified. Among the patients with acute admissions, 54% were women and 45% men. The median age was 63 years for women and 60 for men. 45% of the patients had a low comorbidity index-score, 33% had a medium index-score and 22% had a high index-score. Overall mortality was 5.5% after 30 days, 9.3% after 90 days, and 12.6% after 6 months. Mortality of patients older than 80 years was 13%, 33%, and 29.5%, respectively. Patients with the high comorbidity index-score had a mortality of 11.9%, 20.4%, and 26.9%, respectively.

Conclusion: Mortality after admission with an acute medical disease was strongly associated with age and comorbidity, but did not vary by sex.

P22

Multi-detector CT-angiography is useful in predicting haematoma expansion in patients with acute primary intracerebral hemorrhage

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Background: Primary ICH expands in up to 50% of cases and in these treatment with haemostatic compounds can be potentially beneficial.
Spot detection on multi-detector CT-angiography (MDCTA) studies may identify ongoing bleeding and thus predict haematoma expansion. Aim was to assess the frequency, the prognostic impact and haematoma volume increase in patients with positive spot sign in comparison to no spot sign. 

Methods: A non-contrast CT scan (NCCT) and MDCTA was performed in patients with ICH within 3 hours. A NCCT was performed next day. Radiologists reviewed MDCTAs for spot sign and estimated the haematoma volume. 

Results: In 41.4% spot sign was observed. There was a strong trend that positive spot sign predicted short term mortality 35.9 (CI 0.657;1503.2) (p = 0.041) for age and acute haematoma volume. Mean acute volume was 49.0 ml in patients with spot sign vs. 19.2 ml (p = 0.001). The mean volume increase in patients with spot sign was 12.0 ml corresponding to a 24.5% increase with spot sign vs. 10.4% in other patients (p = 0.009). 

Conclusion: Spot sign identifies patients with later haematoma expansion, and may be useful in identifying patients for proof of principle trials in acute ICH, e.g. testing haemostatic compounds or blood pressure reduction.

P23 
Nurse-led telephone referral to paediatric emergency and assessment units 
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Background: An increasing number of acute referrals have led to unsatisfactory working conditions and a degradation of the service to the families and their children attending paediatric emergency and assessment units (PEAU). The usual way of referring for the general practitioner (GP) was by telephone to the resident. This study investigated if a nurse-led telephone referral system would optimize conditions for patients and staff. 

Methods: The project period was from October to December 2009. A team of five paediatric nurses were in charge of the nurse-led referral system with backup from the attending physician. Prior to the project the nurses were introduced to a flowchart on documentation of the referrals and a guideline to obtain essential information about the child’s condition. The guideline also included a model to ensure efficient and accurate reception and transmission of information - the ISBAR communication model. The project was evaluated using an electronic questionnaire and focus group interviews. 

Aim: * To create optimal continuity of care 
* Optimise service to GPs and other collaborators 
* Improve quality of care to the families 
* To improve working conditions in the PEAU 

Results: Nurse-led telephone referral ensured: 
* Optimal continuity of care as the nurses in charge of referral had a better overview 
* Improved working procedures as information about the children were already documented prior to arrival to the PEAU 
* Better working environment as staff was able to examine the children and talk to the families without interruptions 
* An improved quality of the referral system according to the GPs. 

Conclusion: A nurse-led referral system to the PEAU has proven successful and staff reported improved working conditions. Furthermore did the project shed a light on the importance of a validated triage tool to prioritize acutely admitted children. As a result of this has the PEAU commenced a project in order to develop a paediatric triage tool.

P24 
Patient satisfaction at the Medical Emergency department at Holbæk Hospital 
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Background: The purpose of the study was to examine patient satisfaction at the Medical Emergency department at Holbæk Hospital, and to investigate patient satisfaction for subject groups such as nurses and doctors in medical reception and waiting in reception. 

Methods: The group of persons to be included in the study were patients in medical reception and they were all medical patients, apart from patients who were very acute influenced and therefore could not participate. Patients received a questionnaire. In the questionnaire the patient considered the waiting time in medical reception and the nurses and doctors treatment of the individual patient. The patient could express himself through two options, by indicating satisfactory or unsatisfactory. After the patients had answered and returned the questionnaire, they were grouped together and the responses got analyzed in percentage. 

Results: A total of 20 patients replied. 5% of patients were not satisfied with waiting time in reception and 95% were satisfied. 10% of the patients were not satisfied with the waiting time before the first doctor visit and 90% were satisfied. 100% of patients were satisfied with the first doctor visit. 5% of the patients were not satisfied regarding nursing and 95% were satisfied. Regarding communication between patient and nurse 10% patient were not satisfied and 90% were satisfied. 10% were not satisfied about information and 90% were satisfied. 100% were satisfied regarding patient satisfaction medical treatment. 5% were not satisfied with communication on their health progress. In addition, 5% are unsatisfied with the communication between doctor and patient and the information received on how to proceed in treatment. There must however be subject to bias in this study, since almost all questionnaires were given by the same doctor who treated the patients. Another factor is that the survey was conducted in a small number with only 20 returned questionnaires. This is not a representative amount of respondents.

P25 
Placement and fixation of the endotracheal tube in trauma patients 
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Background: To investigate the incidence of bronchial intubation in trauma patients intubated prehospital or in-hospital, in connection with receiving and treating of trauma patients at the Trauma Center at Aarhus University Hospital. 

To investigate whether the materials currently used for fixation of the tracheal tube ensures secure fixation of the tracheal tube. 

To investigate whether the method of fixation influences the likelihood of bronchial intubation. 

Methods: Prospective registration of the incidence of bronchial intubation in 100 endotracheal intubated trauma patients admitted to the Trauma Center at Aarhus University Hospital from January 2008 to January 2009. Additionally, the method of controlling tube placement, the fixation method used and condition of the patient’s face were recorded. 

Results: No oesophageal intubations were documented during the project period (100 patients)!! 

A total of 17 bronchial intubations occurred in 13 patients (some patients were bronchial intubated twice or more). 

Bronchial intubations were diagnosed using chest x-ray in 10 patients, by lung stethoscopy in 5 patients and by CT scan in 2 patients. 

86 satisfactory fixed tubes were recorded. 

14 tubes were recorded as unsatisfactorily fixed: 9 fixations were reinforced and 5 fixation materials had to be replaced. 

Nine of these patients had facial trauma including blood and facial hair which may have influenced the quality of the fixation.
3 of the bronchially placed tubes were recorded as not satisfactory fixated. **Conclusion:** The number of bronchial intubations should be minimised, and a misplaced endotracheal tube must be diagnosed as early as possible.

This study shows a prevalence of bronchial tube placement at 17%, therefore it would be appropriate to focus attention on the control of tube placement as quickly as possible after the patient’s arrival or intubation in hospital. A chest X-ray should be taken as early as possible.

The number of insufficient tube fixations has locally led to use of the Thomas(TM) endotracheal tube holder, which has been tested and now is the standard fixation material in our Trauma Center.

**P26** Preferred anatomic site for intraosseous infusion in Danish emergency departments
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**Background:** Intraosseous infusion (IOI) is recommended when intravenous access cannot be readily established in resuscitation. There has been debate as to whether which anatomic site should be preferred for IOI. Although success and flow rates in e.g. proximal tuba compared with proximal humerus are not significant different some stress that the tibia should be first choice for IOI because of easily identifiable landmarks. We have as part of a project on IOI use in Danish emergency departments (EDs) assessed the preferred anatomic site for IOI. We hope to promote a debate concerning first choice insertion site for IOI.

**Methods:** Links to an online questionnaire were e-mailed to the Chief of Staff of the twenty emergency departments currently established in Denmark; non-responders were contacted by telephone. The questionnaire focused on the use of IOI in the emergency department including training, equipment, and attitudes. Results concerning preferred anatomic site are presented her.

**Results:** Overall response rate was 95%. Seventy four per cent of Danish emergency department have intraosseous devices. The preferred injection sites were the tibia (84%, n = 16), humerus (10%, n = 2) the medial malleolus (10%, n = 2) and 5% (n = 1) had no preference.

**Conclusion:** The tibia is the preferred anatomic site for IOI in Danish EDs. We believe that the preference for tibia as first choice for IOI may reflect experiences with children were tibia this is the typical insertion site.

**P27** Process driven patient tracks in FAM
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**Background:** The Danish hospital reform requires that in future all acute patients be admitted to one common emergency ward (FAM) at hospitals specially designated for receiving them. At these hospitals they will undergo instant treatment irrespective of time of admittance 24/7/365.

The challenges the designated acute hospitals face is how to plan the FAM in respect to both medical and physical resources, so that instant initial treatment 24/7/365 can be effected, and subsequently determine all the consequences for the rest of the wards.

**Methods:** The method we have used in solving this problem is through use of process driven patient tracks and simulation. In consultation with the specialist wards, we have obtained consensus on six process driven patient tracks that are expected to cover all types of acute patients. For each track we start by determine the medical processes the patient has to go through. Next the necessary types of medical staff and physical resources for each of the medical processes are determined, together with the estimated process time. It is during the initial common process, the visitation/triage, that it is determined which of the six tracks the acute patient falls under.

**Results:** Using the simulation program Flexsim(TM) we are able to quantify the interactions between patients, medical staff and physical facilities hourly during 0-24, given the forecasted future number of acute patients, distributed according to the six patient tracks and their expected hourly 0-24 admittance. Using simulation we can detect and eliminate bottlenecks in an iterative way, and we are consequently able to dimension FAM in regard to both staff and physical requirements. In doing this we have taken into consideration the average time we will allow an acute patient to remain in FAM, including waiting time. This time limit has a major impact on the actual choice of processes and the overall dimensioning of FAM, as well as on the number of the various types of medical and auxiliary staff required to be present hourly 0-24.

**Conclusion:** Introducing process driven patient tracks and using simulation will prove to be important tools for efficient planning and functioning of FAM.
P29
Simulation based teaching of paramedics in endotracheal intubation: a mannequin study
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Background: Previous studies have shown a steep learning curve in endotracheal intubation using the Airtraq® for non skilled personnel. We examined 16 Danish paramedics’ ability to intubate by using the Airtraq®. The paramedics went through a 1-day course at CeMS (Centre for Medical Simulation, the department of Anaesthesia, Aalborg, Denmark) with skill training and simulation based teaching with the Airtraq®. The objective of the course was that the paramedics should be able to intubate in less than 30 seconds.
Methods: A mannequin study with skill training. The skill training was divided into a basic part of practice on a Laerdal® Airway Management Trainer and an advanced part of practice on two different mannequins (Metti HPS(R) and AIRSIM multi(R)) with five attempts to intubate on each mannequin. We observed and registered two time measuring points (A+B): A indicating the time spend from opening the Airtraq® to endotracheal intubation registered by thorax movements, B indicating in seconds the time spend from the Airtraq® passing the mannequin tooth row to secure placement of the endotracheal tube.
Results: The median time for intubation on Laerdal® (Airway Management Trainer was as follows (time B): 1st attempt: 49.00 sec., 2nd attempt: 35.50 sec., 3rd attempt: 34.00 sec., 4th attempt: 25.00 sec., 5th attempt: 22.50 sec. The median time in advanced practice was less than 30 seconds, except the first attempt on METI HPS, which was 45.50 sec. The 5th attempt of intubation on METI HPS and AIRSIM multi was respectively 19.00 and 17.50 sec. There were no failed attempts of intubation. All attempts resulted in successfully endotracheal intubation.
Conclusion: This mannequin study has shown that Danish paramedics are able to learn how to intubate using the Airtraq® on three recognized mannequins designed for skill training in intubation. The objective of the course was them being able to intubate using the Airtraq® in less than 30 seconds, which they fulfill. The median intubation time declines throughout the attempts of intubation, indicating a steep learning curve as previous studies have shown for non skilled personnel using the Airtraq. Also this study has shown that skill training in general increases the individual performance.

P30
Stroke in the ER - a prospective cohort study of patients suspected of stroke / TIA
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Background: Patients suspected of having a stroke or transitory ischemic attack (TIA) require accurate and accurate assessment in the ER in order to initiate immediate and preventive treatment. The clinical diagnosis is complicated by stroke mimics and poor reliability when based solely on history and physical examination.
Methods: The objective was to investigate how many patients suspected of stroke/TIA on pre-hospital evaluation, received this as the final diagnosis following assessment in the ER and finally by neurologists and CTC. For four weeks, data was prospectively collected and reviewed.
Results: Forty patients were included (n = 45) and received the following diagnosis: ischemic stroke/TIA 55.6% (n = 25), hemorrhagic stroke 6.7% (n = 3), other 37.8% (n = 17). Ninety-one percent (n = 41) were admitted for further examination. Eighty percent (n = 20) of patients with validated stroke were aged 61-90 years. In 91% of cases with suspected stroke, the tentative diagnosis was sustained in the ER. Of the admitted patients (n = 41), 63.8% received stroke as a final diagnosis. All patients not deemed to have stroke (31.7%) were diagnosed with stroke mimics. Of all strokes (n = 28) 89.3% were ischemic and 10.7% were hemorrhagic. In the age group 85-89 years, 50% had suffered a prior stroke. Eighty percent of admitted patients younger than 50, were diagnosed with various stroke mimics.
Conclusion: Our results correlate well with previously reported distributions of ischemic versus hemorrhagic stroke. Further, they confirm prior stroke and age as important risk factors. Regarding “unnecessary” admissions (< 24 hrs), it has been debated whether elderly patients with serious sequels to prior strokes would benefit from admission/rehabilitation in relation to a new apoplexy. Our data shows that in the age group 85-89, 75% of patients with a prior stroke were admitted for several days and benefitted from rehabilitation. Thus, so called “unnecessary” admissions of elderly patients with prior stroke needs to be further studied. Overall, the evaluation of patients in the ER is satisfactory and the suspicion of stroke valid, as all patients not having a stroke represented known stroke mimics.

P31
Systematic medication review and health-related outcome in elderly patients acutely admitted to an orthopaedic ward: a randomised controlled study
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Background: Acute admission to hospitals, age and number of drugs are associated with an increased risk of adverse drug events due to morbidity, poly-pharmacy and inappropriate interactions. Thus, the objective of the present study was to investigate if systematic medication review and drug counseling on admission to hospitals would have a significant impact at clinically health-related outcomes in elderly patients admitted acutely to an orthopaedic ward.
Methods: A randomised controlled study comprising 108 patients aged 65 years or older admitted acutely to an orthopaedic ward in Denmark was conducted. Intervention: a clinical pharmacist collected information regarding the patient's medication and medical history in the medical record, the electronic drug order system, the registry of drug purchase and interview with the patient. Subsequently, this was discussed with a clinical pharmacologist and an advisory note with drug recommendations were handed directly to the ward physicians. Control: the usual medication routine in the ward. The primary outcome measure was time to first unscheduled contact to a physician post-discharge limited to emergency department visit, re-admission and general practitioner. Secondary outcomes were admission time, time to first re-admission, number of re-admissions, emergency department visits, ambulatory care visits, contact to general practitioner, physicians outside working hours, medical specialist and finally, quality of life at three-month follow up.
Results: In the intervention group time to first unscheduled contact to a physician post-discharge was 16.3 days (95%CI: 10.5-22.2) and in the control group 25.6 days (95%CI:17.8-33.4), which was not a statistically significant difference. No overall differences between study groups were seen in the secondary outcome measures. The physicians complied with 41 of 222 drug recommendations. Subgroup analysis indicated that physicians were more prone to accept recommendations in the very old treated with numerous of drugs.
Conclusion: The findings do not lead to the recommendation of an extra medication review in a general population of elderly admitted acutely to an orthopaedic ward. Considering the physicians marked hesitation to comply with drug recommendations future studies should explore the
Impact of a differentiated medication review in acute admitted patients based on the individual patient’s risk of adverse drug events.

**P32**
The acceptance of price lists at the emergency department: how do doctors think about it?
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**Background:** In a recent study, it was shown that cost-awareness among physicians working at the Swedish emergency department is very low. In another study, it could be shown that price lists can reduce the costs of laboratory and radiological investigations ordered.

However, cost-cutting projects can result in irritation among physicians feeling themselves to be forced to implement cost-cutting in their daily work and might be considered to be both annoying and unnecessary. To get understanding of physicians view towards price-lists in their daily work we performed a study among physicians involved in patients at the emergency department of a university hospital.

**Methods:** An anonymized questionnaire was distributed among the internal medicine physicians of our university hospital. The data asked for were the level of qualification of the physician (consultant, specialist, senior house officer/registrar (SHO), junior house officer (JHO)), if the physician regarded price lists as a usable tool in their daily work (positive/negative) and if they assumed that knowledge about the costs for investigations would have an impact on the total expenses for investigations performed. The questionnaires were recollected by the hospitals internal mail.

**Results:** A total of 27 questionnaires were recollected by our method. Four consultants, 3 specialists, 16 SHOs and 4 JHos chose to participate in the study.
4 of 4 consultants (100%), 2 of 3 specialists (66.67%), 12 of 16 SHO (75%) and 4 of 4 JHO (100%) considered price-lists to have an impact on the costs for clinical investigations (p < 0.01). 3 of 4 consultants (75%), 2 of 3 specialists (66.67%), 11 of 16 SHO (68.75%) and 4 of 4 JHO (100%) regarded price lists as a useful tool in their daily work (p = 0.051).

**Conclusion:** Medical doctors at our hospital involved in emergency patients regard price-lists as a possibly useful tool in their daily work, and do consider readily available price-lists to have a major impact on cost-cutting. Interestingly, no difference could be seen between the most junior and the most senior doctors participating in this study regarding their positive attitude towards such lists.

**P33**
The conception and implementation of an electronic charting program for use in emergency departments
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**Background:** With the establishment of Holbæk and Køge emergency departments in Region Zealand, Denmark, a novel electronic charting program was conceived and implemented to facilitate the charting process. The objective was to have a full primary medical chart readily available at the time of a patient’s transfer to another hospital ward.

**Methods:** A work group consisting of clinicians and IT professionals constructed a new module containing a chart template within "Opus Arbejdsplads", an existing electronic medical record software used in Region Zealand.

**Results:** The template comprised a combination of text and check boxes, which the doctor was to fill out in the examination room concomitantly with history taking and physical examination (H&P). In the beginning there were layout and stability problems in the software as well as a lack of a sufficient number of computers. Several revisions lead to the current template with a layout close to the traditional Danish medical chart. The electronic charting program has several advantages: It provides doctors and nurses from collaborating wards immediate access to a patient’s chart, thus promoting continuity in patient treatment; and the on-screen template facilitates overview of the contents of a medical chart to the often newly graduated and inexperienced doctor, serving as a reminder of all the important parts of the H&P. A disadvantage is an increased amount of the doctor’s time spent on writing the chart compared to common tape dictation. Furthermore, there is a risk of impaired doctor-patient communication as a result of the doctor writing on a computer while doing the H&P.

**Conclusion:** The implementation of the electronic charting program as a new charting tool in Køge and Holbæk emergency departments in Region Zealand has been successful, and there is great potential for further development of the program to the benefit of both doctors and patients alike.

**P34**
The distribution of triage categories and the impact of emergency symptoms and signs on the triage level
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**Background:** The Emergency Department (ED) at Hillerød Hospital uses a five-level triage system inspired by the Swedish ADAPT process Triage (ADAPT). The triage categories are red, orange, yellow, green and blue. Patients classified as red need immediate treatment whereas blue patients are non-urgent and not admitted to hospital. The patient is assigned a triage category based on both vital signs and on “emergency symptoms and signs” (ESS). The highest level of the two determines the overall triage category.

**Methods:** During a 6 months period, all patients admitted to the ED were registered consecutively and triaged according to the triage model. The patients were triaged at three different time points: 1) at the time of admission to the ED; 2) during reassessment; 3) before transfer to another department or discharge. The following data were registered at each time point: triage time, vital signs (respiratory rate, peripheral saturation by pulse oxymetry, blood pressure, pulse, Glasgow Coma Score and temperature), chief complaint and triage category. All data were entered into a data base specifically designed for the study.

**Results:** In the period 1st of September 2009 to 1st of March 2010 20.409 patients attended the ED of which 6.911 patients were admitted and registered in the database. At the time of ED admission patients were triaged in red, orange, yellow, green and blue. Patients classified as red need immediate treatment whereas blue patients are non-urgent and not admitted to hospital. The patient is assigned a triage category based on both vital signs and on “emergency symptoms and signs” (ESS). The highest level of the two determines the overall triage category.

**Conclusion:** Triage level yellow (needing urgent treatment) was the most common triage category in patients admitted to the ED at a larger Danish hospital. A minority of the patients needed immediate treatment (triaige level red). In more than one third of the patients the chief complaint resulted in an upgrade of the triage category. The distribution of triage categories are important in order to plan for the future organisation of the ED.
P35
The duration of cost-cutting effects of price-lists
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Background: In a recent study it was shown that price lists do have a positive impact on the cost-development at the emergency department. Earlier studies showed that the effect of price lists might decline during the following period, however, no clear schedule for this process could be shown. In this study, we evaluated the declining performance of price lists distributed at a single time point in the context of the emergency department to find the optimum schedule for recurrent intervention.

Methods: Price lists including the most common laboratory and orthopaedic procedures were created. The lists were distributed to all physicians on-call in internal medicine in April 2008. Further lists were exposed at the ED continually until September 2008.

Results: Mean costs for radiologic investigations for all medical and orthopaedic patients during the baseline months of June and July 2007 and from June 2008 till March 2009, the percentage of radiologic investigations for the respective line and the percentage of admission procedures were calculated. Neither clinical nor admission procedures were changed during the period investigated. The physicians were unaware of the study. Statistical analysis was performed on a bimonthly base using the Student’s T-test. Probability levels <0.01 were accepted as significant.

Results: A total of 1442 orthopaedic and 1585 medical patients were accounted during June and July 2007. Between June 2008 and March 2009, 7987 orthopaedic and 9302 medical patients were attended. The radiological costs for medical patients started to climb 8 months after the intervention (+16%) resulting in a significant increase at 10 months (+48%, p < 0.001), whilst the radiological costs for orthopaedic patients slightly increased at 8 months(+13%, p = 0.1) to stabilize afterwards. Admission rates for medical patients did not differ significantly, whilst a decrease in admission rates for orthopaedic patients could be observed (p < 0.01). No significant difference in the rate of radiological investigations could be found for each line.

Conclusion: Price lists are effective to reduce costs at the context of the emergency department. The effect of single interventions declined after 8 months. A repetition after a period of 6 to 8 months might be appropriate to conserve the cost-reducing effects.

P36
The validity of the triage system ADAPT
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Background: Adaptive process triage (ADAPT) is a triage system developed in Sweden in 2006. It is currently used by four University hospitals in the region of Stockholm and several other hospitals in Sweden. It is introduced in several hospitals in Denmark. ADAPT is based on a trace and trigger tool for vital signs according to the ABCD-principle and a short systematic questionnaire for each chief complaint. The main objective is detection of the seriously ill, guidance of healthcare personnel for patient streaming and to be a communication tool. The triage system is based on lean-principles and modern ideas for patient streaming to very urgent care, urgent care, admitting of the elderly and to ‘see and treat’. Following ADAPT each patient are triaged as either red (life-threatening), orange (seriously ill), yellow (ill), green (need of assessment) or blue (fast-track).

The aim of this study is to assess the validity of ADAPT as a triage system.

Methods: All patients visiting the ED at Södersjukhuset in July - December 2008 were eligible for inclusion. Only the first visit of each patient in that time period was recorded. All adult patients visiting (excluding gynaecology and obstetrics) were included. Need for admittance to a ward or ICU was used as outcome parameters. Pearson Chi-square test and Fischers’ exact test was used for statistical assessment of the distribution in the outcome parameters.

Results: N = 35054. Out of these 4.2% were triaged as red, 15.6% orange, 36.6% yellow, 28.7% and 14.8% blue. The red group was admitted to a general ward in 77.5%, orange in 55.6%, yellow in 36.3%, green in 14.9% and blue in 2.0%. There was statistical significance (p = .000).

The red group was admitted to ICU in 24.7% of the cases, orange in 4.6%, yellow in 1.1% yellow, green in 0.2% and blue in 0.0%. There was statistical significance (p = .000).

Conclusion: Our study show that ADAPT triage levels are good predictors of the need for admittance to a general ward as well as a good predictor of the need for intensive care.

P37
Traumatic wound repair: a 2-4 week follow up with focus on patient satisfaction
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Background: The objective of this study was to evaluate ongoing treatment of traumatic wounds, regardless of technique and personnel.

Methods: With the approval of the Danish Data Protection Agency, all incoming patients with traumatic lacerations, during one weeks time in January, were asked for informed consent for a follow-up study. An evaluation of both treatment and result was made by a telephone survey 2-4 weeks time after injury, using a structured questionnaire. Patients were asked to score their overall satisfaction on a numerical scale (0-100). A method used before for that same purpose.

Results: Informed consent was obtained from 15 patients out of 38 registered that week. Loss of follow-up was 1 patient. 15 wounds were included and patients were primary adults. The average time from injury to treatment was 3.2 h. 10 wounds were sutured, 4 received tissue adhesive strips (TAS) and one was glued. The wounds were mostly located on hands and heads, i.e. 7 and 5 wounds, respectively. The average length was 2.7 cm (1-5 cm) for the sutured wounds and under 2 cm for the rest.

The average number of sutures was 4.5. One sutur loosened and caused minor bleeding. With respect to TAS, problems in terms of bleeding, dehiscence and durability were reported. The glued wound had no complications.

Two patients received prophylactic antibiotics for one week. All patients were offered tetanus vaccination and had their wounds cleaned. No patient had been in doubt about self care and none had complications that demanded involvement of the health care system. Patient satisfaction was generally high: The average score for sutured wounds was 91.5 (range 85-100) and for TAS 86 (75-99). The glued wound scored 80.

Conclusion: Patients were pleased with ongoing wound treatment, except for some comments on waiting time. Especially sutured wounds were of good quality and received high scoring. Selection bias and/or a Hawthorne effect are though possible. However, the study also illustrates a troublesome TAS treatment and inconsistency relating to antibiotic treatment.
P38

Two surgeons and the ECG: a double blind study?

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Background: Among medical doctors, an old saying is that two surgeons and an ECG form a double-blind-study. To our knowledge, this prejudice was never controlled scientifically. This is the first study to assess the capability of operating abdominal and orthopaedic surgeons to analyze a set of standardized ECG.

Methods: 30 operating abdominal and orthopaedic surgeons at our university hospital were directly approached to volunteer for this study. Each participant analyzed a set of five standardized ECG with an answering scheme for eight different items, giving a maximum score of 40. The answers were matched according to specialty and experience of the doctors of less than 5 years, between 5 and 10 years or more than 10 years. The reference standard was set by two independent consultants in cardiology. All answers recollected within three months were included in the study.

Only correctly assessed items were accepted, unanswered items were regarded as incorrect. Statistical analysis was performed by the Student’s T-test and confidence intervals were calculated at 95%. Probability (p) levels of < 0.05 were accepted as significant.

Results: Twenty answers could be included, 12 from orthopaedic and 8 from abdominal surgeons. The mean overall score was 25.25 (63.13% ± 4.78%) varying between 38 (95%) and 20(50%). Abdominal surgeons performed a mean score of 27.625 (69.06% ± 9.53%), and orthopaedic surgeons 23.67 points (59.17% ± 3.69%). The difference between the performance of abdominal and orthopaedic surgeons was not significant (p = 0.09). Experienced surgeons seemed to perform slightly better than junior colleagues but no significant difference could be found among the subgroups. 20/20 surgeons identified ST-elevation myocardial infarction (STEMI) and no surgeon accepted the ECG showing acute STEMI as normal.

Conclusion: Abdominal and orthopaedic surgeons provided an answering scheme are able to interpret the ECG and identify both the normal and the ECG showing life-threatening pathology. The hypothesis that surgeons were unable to interpret the ECG must be rejected.

P39

Use of antibiotics at the emergency department

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Background: The question about rational use of antibiotics is always topical. The aim of the present research was to analyse the use of antibiotics in an emergency department (ED):

Which antibiotics are prescribed, how often and under which diagnoses?
Are they appropriate and are they changed in the stationary unit? (All admitted patients are transferred to other units after initial treatment in the ED).
Finally, which microbial cultures are performed before initiation of antibiotic treatment?

Methods: Retrospective analysis of 865 records on admitted patients and 1100 notes on ambulant patients from the ED at Køge Hospital, from October to December 2009. Doctors were not informed beforehand about the subsequent analysis.

To evaluate the choice of antibiotic we used the national recommendations (www.medicin.dk). If any doubt, we used the regional department of microbiology at Slagelse Hospital as reference.

Results: Antibiotics were prescribed to 9% of admitted patients. Main diagnoses were pneumonia (39%), septicema/sepsis (20%) and urinary tract infections (UTI’s) (14%). The most frequently used antibiotics were cefuroxim and benzylpenicillin intravenously (alone or in combination with other antibiotics).

3% of ambulant patients received antibiotics, mainly because of infected or potentially infected skin lesions (91%). Most received tablets of phenoxymethylpenicillin, and the doses varied considerably.

In 100% of skin infections, 90% of pneumonia cases, 75% of septicaemia/ sepsis cases and 36% of UTI’s the choice of antibiotics was in accordance with national recommendations.

Sputum culture was made in 7% of pneumonia cases, urine cultures in 60% of cases with UTI’s. Blood cultures were generally performed with a high frequency.

48 hour follow up showed that in 81% of cases, treatment was not substantially changed in the stationary unit.

Conclusion: Focus on appropriate microbial cultures and correct choice and doses of antibiotics needs to be increased. Treatment of UTI’s has to be reconsidered, as use of cefuroxim was high among these patients. Cefalosporins select ESBL-producing bacteria, and their use needs to be reduced to a minimum. Specific local guidelines for the management of infected patients are in progress, and after implementation of these we will perform a new analysis to assess the effect.

P40

VISZAPP - a tool for rapid patient urgency assessment, admission, and care monitoring and evaluation in emergency departments

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Background: In 2010 the Danish emergency departments will be fewer, but larger which leads to an increase of patients within the units. This induces logistic challenges and demands considerable resources. For instance the phenomenon of “over-crowding” in the emergency room may occur, where a large number of patients blur the clinician’s overview and increases the risk of overlooking patients requiring immediate attention.

In cooperation with the regional hospitals in Viborg, Silkeborg and Skive Logica has developed and implemented VISZAPP(Visitation Zap Application). VISZAPP is a tool for assessing the need for care and prioritizing patients even before actually arriving to the emergency departments.

Methods: A specialised integration engine for healthcare is used to retrieve data (Patient data, initial complaint, trauma data, physiological parameters and a triage score) in a web based application, integrate the data into the hospitals EHR and PAS system and present the data on both PC and 42 inch electronic boards on different locations in the emergency reception areas.

Results: All relevant data are saved electronically. There is no double-registration. No incoming patients are left “unknown”. Specialised paramedic teams are standing by when the patients enter the emergency departments. The administrative work is reduced by 80%. The clinical condition of all incoming patients is assessed according to an evidence based triage model (ADAPT). No cases of “over-crowding” in the emergency departments.

Conclusion: Viszapp was implemented 23rd March 2010. That is why it is not yet possible to conclude whether or not the capability of “knowing” the clinical condition of the patients before arrival to the emergency departments has given a significant difference to patient health outcomes. However, the system facilitates the initiation of further assessment, documentation of patients and is an effective tool for department organisation, monitoring and evaluation.
Background: The current resuscitation guidelines state that basic life support (BLS) should be conducted in two minute cycles. This regime dictates the frequencies of medicine administration and defibrillation during advanced life support in cardiac arrests. Earlier work has shown that participants in a cardiac arrest teams lose their time perception and both over- and underestimate elapsed time. We therefore investigated the best way to tell time during BLS.

Methods: We randomized how the participants should tell time during a BLS cycle. Two methods had an auditory alarm (a person telling the participant when two minutes had elapsed and an alarm-clock going off after two minutes). Six methods made the participant use silent ways to tell time, such as using a large digital watch displayed on the wall, the clock on defibrillator, counting out compression and ventilation cycles (5 alterations) or by counting the total number of compressions (200 compressions). We calculated the sample size to be 9 in each group (power 0.8, alfa 0.05, mean 120 seconds (SD 1.0) vs. 115 seconds (SD 5.0)). We will here present data comparing the median time spent on one cycle from the group that was given auditory alarm (AA-group) to the median time using all other methods (AOM-group). Seeing that the data were nonparametric, we used Wilcoxon signed-rank test.

Results: 16 physicians participated in the study (6 male, mean age 29 years, median number of participation in cardiac arrests 7.5 [range 0-150]). There were 10 BLS sessions in the AA group and 22 in the AOM group. When using an auditory alarm the median time spent on one cycle was 121.9 [range 120.4-123.1] seconds. When using all other methods to tell time the median time spent on one cycle was 110.5 [range 71.7-172.7] seconds, p = 0.005.

Conclusion: We conclude that in order to follow the guidelines of two minutes of BLS you need an auditory alarm to tell you when your two minutes are up, either by a person telling you or an alarm that sounds every two minutes.