

MEETING ABSTRACTS

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MEETING ABSTRACTS

A1

Education of future paramedics - variation in level of experience when entering paramedic training. A quantitative pilot study

Rasmus Malmberg-Lyngby^{1*}, Martin Betzer²

¹Pre-hospital system, Region East, Denmark; ²Pre-hospital system, Region Copenhagen, Denmark

E-mail: rasmuslyngby@gmail.com

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Background: After three years of employment an ambulance technician (AT) can start paramedic education. The period of three years is dictated by law and does not include any benchmarking of individual skills or number of cases handled. The aim of this study is to investigate if there are major differences in levels of experience for ATs, focusing on numbers of patients handled, drug administrations, use of skills, and patient categories as variables.

Methods: We obtained data on the number of patients treated annually by the ambulance service from "Tender for Ambulance Service in the Copenhagen Region" (Region Hovedstaden). Highest and lowest patient flows were identified and compared. Data on drug administrations, skills, and patient categories were obtained from an AT questionnaire survey. Highest and lowest frequencies were identified and compared. All data obtained was categorized following the same geographical sub areas as in the "Tender for Ambulance Service in the Copenhagen Region".

Results: Patient flow data shows a significant difference between the 6 sub areas in the region. Areas with the lowest patient flow allow for the average AT to obtain 565 patient contacts per year, while ATs in a high flow area could obtain 1,200 patient contacts - a difference of 112%. Patient flow data is confirmed by the questionnaire survey that also reveals that the number of calls dispatched to units vary, which allows for a larger difference in patient flow if measured on the individual AT and not the average of an area. The questionnaire survey also reveals that administrations of drugs, use of skills, and patient categories for the individual AT have significant variations. Differences in drug administrations have shown to be in a ratio of up to 8:1, skills 49:1, and patient categories 18:1.

Conclusion: The study showed significant differences in patient contacts, drug administrations, and use of skills. The study revealed that a three-year-period as the only benchmark of experience is an unreliable method of measuring or determining the individual experience in student paramedics. Timeframe based benchmarks will not give a uniform level of experience and have shown to be an unreliable method to measure pre-hospital experience.

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A2

Pre-hospital transported patients - a resource for accessing prognostic risk factors

Camilla LN Bech^{1*}, Mikkel Brabrand^{1,2}, Annmarie Lassen¹

¹Department of Emergency Medicine, OUH Odense University Hospital, Odense, Denmark; ²Department of Emergency Medicine, Sydvestjysk Sygehus, Esbjerg, Denmark

E-mail: Camilla.noergaard.bech@rsyd.dk

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Background: The survival of patients transported by ambulance depends not only on the clinical condition but also on other patient-related factors and the organizational pre-hospital setup. Until now, information on patients in the pre-hospital system has been almost unexplored. However, these data could form a valuable resource for assessing potential risk factors associated with adverse outcomes. Our aim was to describe ambulance transports to the Emergency Department and identify prognostic factors accessible in the pre-hospital phase and associated with seven-day mortality.

Methods: We included all adult patients (> 18 years) transported by ambulance to the Emergency Department at Odense University Hospital in the period 1st of April 2012 to 30th of September 2013. Ambulance personnel recorded vital signs and other clinical findings on a structured form on paper during the ambulance transport. Each contact was linked to information from population based healthcare registers in order to identify comorbid conditions and information on mortality. Demographic factors and first registered vital sign were analyzed by univariate logistic regression analysis with seven-day mortality as the outcome.

Results: In total, 24,620 ambulance contacts were identified. The median age of the patients was 61.4 years (IQR: 46-79), 49.5% were female, and 34.4% had severe comorbidity (defined as a Charlson Comorbidity Index > = 2). Over-all, seven-day mortality was 3.9% (95% CI: 3.6-4.1%), with 450 deceased females (3.9%) and 499 deceased males (4.0%). Univariate analyses revealed age, above 70 years; OR 16.2 (95% CI: 8.61-30.3), Charlson score ≥2; OR 2.65 (95% CI 2.28-3.09), and vital parameters outside normal reference to be associated with seven-day mortality: Glasgow Coma Scale score < 14 OR 8.62 (95% CI: 7.52-9.89), peripheral oxygen saturation < 95% OR 2.75 (95% CI 2.41-3.15), respiratory rate >20/min OR 5.15 (95% CI: 4.5-5.91), systolic blood pressure <110mmHg OR 2.17 (95% CI:2.17-3.35) and pulse > 90 OR 2.47 (95% CI: 2.16-2.83), respectively.

Conclusions: We found that several pre-hospital-registered vital signs recorded by ambulance personnel at first contact with the patient were prognostic factors of seven-day mortality.

A3

Pre-hospital data as risk predictors of seriousness among traumatically injured patients

Alexander Franzén, Kim L Schultz, Jens O Laursen, Christian B Mogensen*
Emergency Department, Hospital of Southern Jutland, Aabenraa, Denmark
E-mail: Christian.backer.mogensen@rsyd.dk
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Background: Currently many hospitals activate a trauma team with a predefined large team of health care professionals as a response to a trauma call. For hospitals with limited resources, this is a demanding process, which weakens the overall hospital performance by allocating considerable resources to the trauma room. Most trauma calls are based on trauma schemes scores from a combination of physiologic- anatomic injury- and injury mechanism criteria. In the search for indicators which might be used for a more differentiated hospital response, the aim of this study was to investigate the relative importance of pre-hospital variables in identifying "high risk" patients.

Methods: The study was a historical prospective cohort study conducted at a level 2 trauma hospital in Southern Denmark. The inclusion criterion was traumatically injured patients above 14 years of age, requiring activation of the trauma team over a one-year period. The outcome was "high risk" patients, requiring one or more of the following: In-hospital stay more than 48 hours, orthopaedic or non-orthopaedic surgery performed, ICU stay, transfer to another hospital, or injury related death within 30 days. Logistic regression was used to evaluate the relationship between pre-hospital variables and high risk.

Results: Of the 393 injured patients included, 30.0% were high risk patients. Statistically significant independent variables associated with high risk included anatomic injury criteria (OR = 5.5; 95% CI: 2.13-14.23), age 35-55 years (OR = 2.7; 95% CI: 1.31-5.55), age above 55 years (OR = 4.8; 95% CI: 2.30-9.97), pre-hospital systolic blood pressure 90-110 mmHg (OR = 3.8; 95% CI 1.02-13.92), "pedestrian struck by motor vehicle" (OR = 4.3; 95% CI: 1.42-12.76), and oxygen saturation 90-94% (OR = 3.4; 95% CI: 1.30-8.64).

Conclusions: Our findings demonstrate that age, systolic blood pressure, oxygen saturation, and anatomic injury criteria are associated with high risk traumas and should be considered for inclusion in a trauma team activation protocol and further tested in such a model. Besides pedestrians struck by motor vehicle, the mechanism of injury has revealed poor predictive capabilities.

A4

Emergency dispatch, FirstAED global positioning of first responders with distinct roles - a solution to reduce the response times and ensuring early defibrillation in the rural area Langeland

Henrik Schakow¹, Mogens L Larsen², Finn L Henriksen¹
¹The AED Center, Department of Cardiology, OUH Odense University Hospital, Odense, Denmark; ²Department of Health Science and Technology, Aalborg University, Aalborg, Denmark
E-mail: finn.l.henriksen@rsyd.dk
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Purpose: FirstAED is meant as a supplement to the existing emergency response systems. The purpose is to shorten the first responder response times at emergency calls to below 5 minutes on the island of Langeland. The FirstAED project defines a new way to dispatch the nearby first responders and organize their roles in the hope of reducing response times and improving survival rates.

Methods: First aid and cardiopulmonary resuscitation is provided by 215 first responders who use their smartphone (iPhone 4S/5). The population purchased 95 AEDs which are available around the clock and placed less than two kilometres apart. FirstAED is an auxiliary to the public services and it enables the emergency dispatcher to send an organized team of first

responders with distinct roles to the scene. FirstAED global positioning system GPS-track the 9 nearby first responders. FirstAED chooses the 3 most optimally located first responders who have accepted the alarm. FirstAED organizes the three first responders in a team: no. 1 reaches the patient to give cardiopulmonary resuscitation; no. 2 brings the AED; and no. 3 is the onsite coordinator.

Results: During the first 21 months the FirstAED GPS system was used 588 times. Three first responders arrived in 89% of the cases, and they arrived before the ambulance in 95% of the cases. FirstAED entailed a significant reduction in median response time from more than 8 minutes before to 4 minutes and 9 seconds after. The first responder was on site in less than 5 minutes in more than 60% of the cases. The AED was on site within a median time of 5 minutes and 58 seconds. The first responders were on behalf of their short response time involved in many different cases: cardiac arrest, disease, accidents, traffic accidents, fire, subarachnoid haemorrhage, hanging, divers' decompression sickness, and sea rescue.

Conclusions: GPS-tracking reduces the response times, and the quality of the effort improves as all the first responders who accept the FirstAED alarm have distinct roles.

A5

Changes in severity of traffic related trauma aged 18+ admitted to a local level 2 trauma centre after the introduction of the Mobile Emergency Care Unit at Southern Funen. A pilot study

Stine Hebsgaard¹, Stine T Zwisler¹, Jens Lauritsen²
¹Department of Anaesthesiology & Intensive Care, OUH Odense University Hospital, Svendborg, Denmark; ²Accident Analysis Group, Department of Orthopaedics, OUH Odense University Hospital, Odense, Denmark
E-mail: Stine.hebsgaard@gmail.com
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Background: Centralizing and specializing in Danish health care is ongoing. Around the country Mobile Emergency Care Units (MECU) are introduced during the past years. Pre-hospital triage is important to evaluate at which trauma level the severely injured patients must be received. The aim of our study was to evaluate changes in the severity in 18+ traffic related trauma admitted to a level 2 centre at Odense University Hospital, Svendborg Hospital (OUH, SH) after the introduction of a local MECU.

Methods: The study was a retrospective study covering a ten-year period from 2002-2012. All admissions from traffic accidents to OUH, SH were extracted from the hospital inpatient registry for patients aged 18+. Based on clinical record reviews and radiology findings, we decided if the patient was multi trauma (MT) defined as received by trauma response team and/or CT trauma scanned. We evaluated the diagnoses and assigned whether maximum Abbreviated Injury Score (mAIS) was three or more (severe injury). A total of 363 traffic injury patients were identified. Five were undeterminable in MT status and 137 non-MT patients were excluded, giving 221 adult MT cases for analysis. From the years 2002-2006 (118 MT) - before and 2010-2012 (46 MT) - after implementing the MECU 24/7 in Svendborg September 1st 2009. The years 2007-2009 were extracted since the MECU was launched part time in 2007. The study was performed as a pilot study including patients born on the 1st to 6th of each month.

Results: Proportion of mAIS ≥ 3 in the years before implementing the MECU in Svendborg was 17.1% (CI: 10.2-24.0) versus 23.9% (CI: 11.1-36.7) in the years after the implementation ($p = 0.32$).

Conclusions: There was no significant change in the proportion of severely injured patients admitted to this level 2 trauma centre after implementation of the local MECU in this study.

A6

Initial treatment of febrile seizures by mobile emergency care units in a cohort of children in the Region of Southern Denmark

Morten O Holm^{1*}, Søren Mikkelsen^{1,2}, Søren B Jepsen^{1,2}
¹Department of Anaesthesiology and Intensive Care, Odense University Hospital, Odense, Denmark; ²Mobile Emergency Care Unit, Department of Anaesthesiology and Intensive Care, Odense University Hospital, Odense, Denmark
E-mail: Morten.olskjaer.holm@rsyd.dk
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Background: Witnessing one's child having febrile seizures is a shocking experience to parents who may fear that their child is going to die. Febrile seizures are thus perceived as a serious illness and, accordingly, a physician-manned Mobile Emergency Care Unit (MECU) is often dispatched to the scene together with an ordinary ambulance. The aim of the study was to quantify the occurrence of febrile seizures and to assess the extent of treatment administered by the MECU in the Region of Southern Denmark.

Methods: Retrospective observational study of the MECU database. The study is based on all 5,486 MECU runs in the Region of Southern Denmark involving children less than 15 years of age during the years 2010 - 2013. The included patients in the study were all assigned the diagnosis febrile seizures (R56.0) by the physician on site.

Results: A total of 1,219 patients (22.2%) were assigned the diagnosis febrile seizures by the physician on site. Mean age was 24.5 months (ranging from 0 to 151 months). None of the patients died nor needed CPR. Three patients (0.2%) were intubated on site, 74 patients (6.1%) received anticonvulsive therapy intravenously by the physician, 343 patients (28.1%) were admitted to the hospital with physician escort, and 4 treatments (0.3%) were considered lifesaving by the treating physician.

Conclusions: Febrile seizures were the largest diagnosis group in patients under 15 years of age in the cohort. Advanced medical treatment including tracheal intubation requiring a physician was rare. Further studies are warranted to determine the need for MECU physician treatment of febrile seizures.

A7

Infrequent use of Public Access Defibrillation in spite of great benefit

Marianne Agerskov^{1*}, Anne M Nielsen^{1,2}, Mads W Jørgensen^{3,2},
Freddy K Lippert², Lars S Rasmussen¹

¹Department of Anaesthesia, Centre of Head and Orthopaedics, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark;

²Emergency Medical Services, Copenhagen, Denmark; ³Department of Cardiology, University of Copenhagen, Gentofte, Denmark

E-mail: marianneagerskov@hotmail.com

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Background: Despite wide dissemination of Public Access Defibrillation (PAD) and attempts to raise public awareness, use of Out of Hospital Cardiac Arrest (OHCA) is still limited. We aimed to study the use of PAD in Copenhagen. We primarily sought to determine the proportion of OHCA victims with an Automated External Defibrillator (AED) deployed before arrival of the Emergency Medical Services (EMS). In addition, we compared characteristics of OHCA victims according to use of AED.

Methods: Between 2011 and 2013 we collected data on treated OHCA in Copenhagen from the EMS, the Danish Cardiac Arrest Registry, and ECG downloads from deployed AEDs. Data on characteristics are reported as median values with Inter Quartile Range (IQR).

Results: An AED was applied to an OHCA-victim prior to arrival of the EMS in 33 instances, corresponding to 3.7% of 903 AEDs registered in the voluntary network, www.hjertestarter.dk in Copenhagen. We identified 640 patients with treated OHCA in the EMS registry, of these 22 (3.4%, 95% CI [2.3-5.2]) had an AED applied, and 12 were defibrillated. Eleven of the 33 AED cases (33%) were not registered by the EMS. Six of these in fact had OHCA. Three had achieved Return Of Spontaneous Circulation (ROSC) upon arrival of the EMS and were not treated and 3 were declared dead. Four patients had no OHCA and one could not be identified. ROSC at hospital admission was significantly higher if an AED was applied (16/22 (73%) vs. 190/618 (31%), $p < 0.0001$). There was no significant difference in age ([61-77] vs. 68 [55-79] years, $p = 0.64$), response time (5 [4-7] vs. 5 [4-7] min, $p = 0.41$) or sex (male gender in 16 (73%) vs. 384 (62%), $p = 0.38$) according to AED deployment. An AED was applied in 4.0% of OHCA in daytime vs. 2.7% during evening and night-time ($p = 0.39$).

Conclusions: An AED was applied prior to EMS arrival in a minor proportion of OHCA and it could not be explained by differences in patient characteristics. However, a high survival rate to hospital admission of 73% in patients where an AED was used before EMS arrival indicates the potential and the need to overcome challenges in Public Access Defibrillation.

A8

How does the different pre-hospital healthcare workers dispatch ambulances in the pre-hospital environment in Denmark

Lasse P Bentsen^{1,2}

¹University of Southern Denmark, Odense, Denmark; ²Falck Danmark A/S, Odense, Denmark

E-mail: lasse.p.bentsen@gmail.com

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Background: In Denmark, all ambulance transports are dispatched through the Acute Medical Coordination Centre (AMK). Even though this unit is the only way to request an ambulance, it is experienced by many Emergency Technicians EMTs that the visitation based on patient illness and injury differs widely. The visitation is performed either by an AMK visitation officer (AMK-VO), or a doctor that takes contact to AMK to get the ambulance dispatched. Correct dispatching of emergency services can be a complex affair because AMK cannot see the patients themselves.

Methods: Three different cases were presented for EMTs, paramedics, and visitation officers at AMK. Each was asked to assign what kind of dispatch level (A, B, or C, where A is the most urgent) they would assign to the patients current need. They were also asked what kind of treatment they think the patient would need from the ambulance and the need for a medical emergency care unit (MECU).

Results: We had 116 responses (43 assistant EMTs, 36 treating EMTs, 27 paramedics, and 10 AMK-VO's). There was no statistical difference in any of the cases regarding if the respondents would dispatch differently, $p = 0.4$, 0.2 and 0.4 , respectively. AMK-VO's were more likely to anticipate the use of pharmacological intervention in case 2 ($p < 0.001$) and the use of isotonic NaCl infusion in cases 2 and 3 ($p < 0.001$) than other respondents.

Conclusion: Even though the results do not show statistically significant differences, a larger and more structured survey is needed, especially considering the relatively small number of respondents in the AMK-VO group. It should also be noted that the cases were presented in written form, and that visitation normally is performed via phone contact. This could make a difference in how people would dispatch ambulances in reality. The anticipated treatment differed between the groups, when considering isotonic NaCl infusion and pharmacological intervention.

A9

Does the age of medical emergency technicians influence the quality of chest compressions

Svend Vittinghus^{1,2*}, Jakob E Thomsen², Martin Harpsø², Bo Løfgren^{2,3,4}

¹Falck Danmark A/S, Copenhagen, Denmark; ²Research Center for Emergency Medicine, Aarhus University Hospital, Aarhus, Denmark; ³Department of Internal Medicine, Regional Hospital of Randers, Randers, Denmark; ⁴Institute of Clinical Medicine, Aarhus University, Aarhus, Denmark

E-mail: Svendvittinghus@me.com

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Background: International resuscitation guidelines emphasize performance of high quality chest compressions. In out-of-hospital cardiac arrest Emergency Medical Technicians (EMT) play an important role in delivering chest compressions. Delivery of chest compressions is physically demanding and the quality of chest compressions is related to the fitness of the rescuer. Physical fitness may decrease with age. It is currently unknown whether age of professional rescuers influences the quality of chest compressions. The aim of this study was to investigate if the age of EMTs influences quality of chest compressions.

Method: EMTs trained in the 2010 resuscitation guidelines delivered uninterrupted chest compressions for 6 min on a mannequin. Data were collected from the mannequin on a laptop and from video recordings. EMTs were divided into three groups: <36 (young), 36-50 (middle age) and >50 (oldest) years. Primary outcome measure: chest compression rate and depth measured for the first 2 (0-2) min of chest compressions. Secondary outcome measure: chest compression rate and depth measured for the last 2 (4-6) min.

Results: In total, 86 EMTs were included (young, n = 26; middle age, n = 37; oldest, n = 23). During the first 2 (0-2) min, chest compression depth tended (ANOVA, p = 0.08) to be lower among the oldest (mean \pm SD: oldest: 43 \pm 12 mm; middle age: 49 \pm 9 mm; young: 46 \pm 10 mm). Chest compression rate was significantly higher among the oldest (118 \pm 15 min⁻¹) when compared to the middle age (106 \pm 14 min⁻¹, p < 0.01) but not significant different from the young (112 \pm 13 min⁻¹). In the final 2 (4-6) min, chest compression depth was lower among the oldest (41 \pm 13 mm) compared to middle age (48 \pm 10 mm, p < 0.05) but not the young (43 \pm 9 mm). In contrast, chest compression rate was significantly higher among the oldest (118 \pm 16 min⁻¹) when compared to the middle age (104 \pm 17 min⁻¹, p < 0.05) but not significantly different from the young (114 \pm 17 min⁻¹).

Conclusion: Age influence chest compression quality parameters among EMTs. There is a tendency to a clinical significant reduction in chest compression depth among the oldest EMT. Mean chest compression depth was too low among all groups of EMTs underlining the importance of CPR training and regular retraining.

A10

Prescriptions of antidepressants and anxiolytics in survivors of out-of-hospital cardiac arrest - a nationwide register-based follow-up study

Kristian Bundgaard^{1,2*}, Kristian Kragholm¹, Rikke N Mortensen³, Steen M Hansen², Christian Torp-Pedersen², Bodil S Rasmussen¹
¹Department of Anaesthesiology and Intensive Care Medicine, Aalborg University Hospital, Aalborg, Denmark; ²Department of Health, Science and Technology, Aalborg University, Aalborg, Denmark; ³Department of Clinical Epidemiology, Aalborg University Hospital, Aalborg, Denmark
E-mail: Kristian.Bundgaard@RN.dk

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Background: The need for treatment with antidepressants and anxiolytics in survivors of out-of-hospital cardiac arrest (OHCA) is not known. Such use is an important part of evaluating neurological outcome in OHCA survivors and we have therefore performed a nationwide study.

Methods: Nationwide data on OHCA from the years 2001-2011 was available from the Danish Cardiac Arrest Registry. We linked data to the Danish National Prescription Registry and excluded patients with prior prescriptions of antidepressants and/or anxiolytics within half a year before OHCA. We calculated time to the first prescription of antidepressants and/or anxiolytics following OHCA. Multivariable analyses were carried out using cause-specific Cox regression methods, taking competing risk of death into consideration.

Results: From 2,469 30-day OHCA survivors, we included 2,018 cases (median age 62 (IQR 53-71), 79.7% men) in the study population, of which 242 (11.2%) were prescribed an antidepressant and 165 (8.2%) were prescribed an anxiolytic drug during the first year after OHCA. Stratified by years (2001-2005 vs. 2006-2011), 77 (12.5%) versus 165 survivors (11.8%) were prescribed an antidepressant (p = 0.92), and 62 (8.2%) versus 103 (7.4%) survivors were prescribed an anxiolytic drug (p = 0.78). Cardiac arrest witnessed by bystander (HR 0.63 (95% CI 0.43-0.93, p = 0.019) and bystander cardiopulmonary resuscitation (HR 0.73 (95% CI 0.53-0.99, p = 0.045), were in multivariable analyses associated with less prescriptions of antidepressants within follow-up period. Similar results were seen in prescriptions of anxiolytics: cardiac arrest witnessed by bystander (HR 0.57 (95% CI 0.36-0.90, p = 0.015), and bystander cardiopulmonary resuscitation (HR 0.57 (95% CI 0.39-0.83, p = 0.003). Age above 74 years, Charlson comorbidity index score above 0 and non-shockable initial heart rhythm were associated with death during the follow-up period.

Conclusions: Overall, 11.2% of the survivors were prescribed an antidepressant drug and 8.2% were prescribed an anxiolytic drug during the first year after OHCA. Cardiac arrests witnessed by bystander and bystander cardiopulmonary resuscitation were in our multivariable models associated with less prescriptions of antidepressants and anxiolytics, stressing the importance of early, prompt interventions in OHCA care on outcome.

A11

Defining hypotension in the emergency department and in the pre-hospital setting: A hospital-based cohort study

Anders KB Kristensen^{1*}, Jon G Holler¹, Søren Mikkelsen², Jesper Hallas³, Annmarie Lassen¹

¹Department of Emergency Medicine, OUH Odense University Hospital, Odense, Denmark; ²Department of Anaesthesiology and Intensive Care Medicine, OUH Odense University Hospital, Odense, Denmark; ³Clinical Pharmacology, Institute of Public Health, University of Southern Denmark, Odense, Denmark

E-mail: anders.bruun.kristensen@rsyd.dk

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Background: Systolic blood pressure is a key parameter when identifying patients in shock. However, the systolic blood pressure level below which a given patient should be considered hypotensive is subject to debate. Furthermore, recent studies have advocated higher systolic blood pressure thresholds than the traditionally recognized 90 mmHg. The aim of this study was to identify the best performing systolic blood pressure thresholds with regards to predicting 7-day mortality and to evaluate the applicability of these in the emergency department and in the pre-hospital setting.

Methods: A hospital-based cohort study from Odense University Hospital of all adult patients in the emergency department between 1995 and 2011, all patients transported to the emergency department in non-physician staffed ambulances in the period 2012-2013, and all patients serviced by the physician staffed ambulances in Odense between 2007 and 2013. Exposure was the first recorded systolic blood pressure and the main outcome was 7-day mortality. Best performing thresholds were identified with methods based on receiver operating characteristics and multivariate regression. Performance of systolic blood pressure thresholds was evaluated with standard summary statistics for diagnostic tests.

Results: 7-day mortality rates varied from 1.8% (95% CI [1.7, 1.9]) of 112,727 patients in the emergency department to 2.2% (95% CI [2.0, 2.5]) of 15,862 patients in the non-physician staffed ambulance and 5.7% (95% CI [5.3, 6.2]) of 12,270 patients in the physician staffed ambulance cohort. Best performing thresholds ranged from 95 to 119 mmHg in the emergency department, 103-120 mmHg in the non-physician staffed ambulance, and 101-115 mmHg in the physician staffed ambulance.

Conclusions: A systolic blood pressure threshold of 100-110 mmHg might be a clinically relevant trigger point in the emergency department and the pre-hospital setting.

A12

The relationship between body temperature, heart rate and respiratory rate in acute patients at admission to a medical care unit

Maria M Jensen^{1*}, Mikkel Brabrand²

¹Emergency Department, Skånes University Hospital, Lund, Sweden;

²Emergency Department, Sydvestjysk Sygehus, Esbjerg, Denmark

E-mail: mariamaj1@hotmail.com

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Background: An increase in body temperature (BT) is followed by an increase in heart rate (HR) and respiratory rate (RR). Only a few studies have explored the magnitude of this increase. These studies all included young healthy study subjects not taking any medicine that influenced the cardiovascular system. We wished to investigate this relationship in a study group more representative of the acute patients we meet in an emergency department.

Methods: Vital parameters from 4,493 acute patients obtained at admittance to the medical admission unit at Sydvestjysk Sygehus, Esbjerg, were retrospectively extracted from the hospital database. Linear and multiple variable regression analysis was used to calculate the change in HR (Δ HR/ $^{\circ}$ C) and RR (Δ RR/ $^{\circ}$ C) corresponding to variations in BT for the entire study group and after dividing the group in low (<36.4 $^{\circ}$ C), normal (36.4-37.2 $^{\circ}$ C) and high (>37.2 $^{\circ}$ C) BT.

Results: The study population consisted of 2,219 males and 2,274 females with a mean age of 62.2 \pm 19.2 years. The Δ HR/ $^{\circ}$ C and Δ RR/ $^{\circ}$ C for

the whole population was 7.2 ± 0.4 beats per minute (bpm) and 1.4 ± 0.1 breaths per minute (brpm). When adjusting for age, oxygen saturation and mean blood pressure, the results were 6.4 ± 0.4 bpm and 1.2 ± 0.1 brpm, respectively. In groups with low, normal and high BT the $\Delta HR/^\circ C$ for the three groups were 2.7 ± 1.9 , 6.9 ± 1.9 and 7.4 ± 0.9 bpm, respectively. With regard to $\Delta RR/^\circ C$ the values were -0.5 ± 0.5 , 1.5 ± 0.5 and 2.3 ± 0.3 brpm, respectively.

Conclusions: The previously most widely cited study on the association between BT and HR was performed in 1951 and reported a $\Delta HR/^\circ C$ of 14.7 bpm. Later studies have shown a mean $\Delta HR/^\circ C$ of 9.7 bpm. We have been unable to locate any references for the association between BT and RR. However, a $\Delta RR/^\circ C$ of 2.0-4.0 brpm seems to be mostly agreed upon in the literature. We found a somewhat lower $\Delta HR/^\circ C$ and $\Delta RR/^\circ C$ than previously reported, in our population of subjects, adjusting for age, oxygen saturation and mean blood pressure. The highest $\Delta HR/^\circ C$ and $\Delta RR/^\circ C$ were seen in the groups with the highest BT. We found no significant trends in the groups with low BT.

A13

Triage of acute medical patients - interobserver Reliability

Jacob B Brodersen^{1,2*}, Peter Hallas³, Mikkel Brabrand^{2,4}

¹Department of Medical Gastroenterology, Odense University Hospital, Odense C, Denmark; ²Department of Emergency Medicine, Sydvestjysk Sygehus, Esbjerg, Denmark; ³Copenhagen University Hospital, Department of Pediatric Anesthesia, Rigshospitalet, Copenhagen, Denmark; ⁴Department of Emergency Medicine, OUH Odense University Hospital, Odense, Denmark
E-mail: jbbrodersen@dadlnet.dk

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Background: In most emergency departments (ED) around the world, patients are initially assessed using a triage system or risk stratification tools. The result of the scores is an important factor in determining the course of treatment for critically ill patients. Several different systems are used, but most include blood pressure, respiratory rate, pulse, and level of consciousness and the individual systems then have a number of different parameters. Considering the vital role the results of these scores have on the course of treatment, the number of studies on inter-observer reliability is limited. The aim of this study was to measure the inter-observer variability when assessing patients using the Danish Emergency Process Triage (DEPT) (using only vital signs), the Modified Early Warning Score (MEWS), the HOTEL score, the Simple Clinical Score (SCS) and PARIS score.

Methods: This is a questionnaire study, based on video recordings made at the admission of acutely ill medical patients to the emergency department. The videos were recorded during the first 10-15 minutes after arrival of the patient to the department of emergency medicine at Sydvestjysk Sygehus Esbjerg. The video were edited and shown in an internet based questionnaire.

Inclusion of observers started with an initial open invitation to participate in a questionnaire study, and the responders was included in the actual study. Cases were assigned at random, and each nurse used all five systems to evaluate the same patient. The Intra Class Coefficient (ICC) was calculated for each system.

Results: Five cases were used and eight observers evaluated each case. All observers were trained nurses with a median experience of 14.65 (range 2-35) years. The individual ICC of DEPT was 0.64 (95% confidence interval (CI): 0.33-0.94), MEWS 0.00 (95% CI: 0.00-0.46), HOTEL 0.70 (95% CI: 0.39-0.95), SCS 0.08 (95% CI: 0.00-0.63) and PARIS 0.39 (95% CI: 0.11-0.87).

Conclusions: HOTEL and DEPT - which is the triage system most widely used in Denmark - had the highest ICC of the five systems. In particular, MEWS had a poor ICC.

A14

Respiratory rate - interobserver reliability study

Jacob B Brodersen^{1,2*}, Peter Hallas³, Mikkel Brabrand^{2,4}

¹Department of Medical Gastroenterology, OUH Odense University Hospital, Odense, Denmark; ²Department of Emergency Medicine, Sydvestjysk Sygehus, Esbjerg, Denmark; ³Copenhagen University Hospital, Department of

Pediatric Anesthesia, Rigshospitalet, Copenhagen, Denmark; ⁴Department of Emergency Medicine, OUH Odense University Hospital, Odense, Denmark
E-mail: jbbrodersen@dadlnet.dk

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Background: Measuring respiratory rate (RR) is one of the most basic clinical observations performed when accessing acutely ill patients. RR is included in most triage systems and risk stratifications tools, but unlike the other vital signs, RR is typically obtained by a manual count by the nursing staff. Considering how often RR is used in clinical practice and contained in triage systems, it is remarkable how few studies on inter-observer/rater agreement have actually been performed. Furthermore, the existing studies are all made with few observers and many patients, and none of them have been performed in an actual acute setting of an emergency department (ED). We therefore aimed to determine the interobserver variability of RR counts, using a larger number of observers on few same patients in the setting of an ED.

Methods: This is a reliability study on the manual count of RR, based on video recordings made at the admission of acutely ill medical patients to the emergency department. The assessment of RR was done as a part of a larger triage study, making the raters unaware of the focus on RR. The main study was a cross-sectional study on the reliability of existing triage systems. The videos were recorded during the first 15 minutes after arrival of the patient to the Emergency Department at Sydvestjysk Sygehus, Esbjerg. The videos were anonymized and shown as part of the complete internet-based questionnaire. We calculated the individual Intra Class Coefficient.

Results: Seven patient videos were assessed by eight observers. Each observer only assessed one case. All observers were trained nurses with a median experience of 15.23 years (range 0-37). The assessment of RR of each video ranged from 22-36, 24-32, 14-32, 12-30, 22-32, 20-30 and 19-30, respectively. The individual absolute ICC was 0.13 (95% confidence interval: 0.00-0.56).

Conclusions: We found poor agreement comparing the actual number of breaths per minute and a very low ICC. However, our methods of using video recording in the ED on acutely ill patients as a base for inter-observer studies proved useful, and have potential for further use.

A15

Comparison of systematic triage with clinical assessment in prediction of short-term mortality

Anne K S Iversen^{1*}, Jakob L Forberg², Morten Schou³, Lars S Rasmussen⁴, Lars Køber⁵, Kasper Iversen³

¹Department of Cardiology and Endocrinology, Hospital Of Northern Zealand, Hillerød Hospital, Hillerød, Denmark; ²Department of Emergency Medicine, Hospital Of Northern Zealand, Hillerød Hospital, Hillerød, Denmark;

³Department of Cardiology, Herlev Hospital, University of Copenhagen, Copenhagen, Denmark; ⁴Department of Anaesthesia, Centre Of Head and Orthopaedics, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark; ⁵Department of Cardiology, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark

E-mail: Anneksiversen@gmail.com

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Background: Prior to introduction of systematic triage, patients were prioritized in Emergency Departments based on clinical assessment. Validation of systematic triage is sparse and in this study we compared the systematic triage tool Danish Emergency Process Triage (DEPT) with a quick clinical assessment by inexperienced hospital staff as markers of short-term mortality.

Method: A prospective cohort study was conducted at Hillerød University Hospital. All patients admitted to the Emergency Department (ED) from September 2013 to December 2013 were included. Triage was performed by a trained nurse using the ED's standard triage tool, DEPT, and patients were categorized as green (not urgent), yellow, orange or red (most urgent). A phlebotomist performed a quick clinical assessment (eyeball triage) to do the same categorisation but only based on a look at the patient and the main complaint. The primary endpoint was 30-day mortality.

Results: A total of 6,383 admissions (5,568 patients) were included. DEPT triage was performed for 6,290 (98.5%) and eyeball triage for 6,382 (>99.9%) of the admissions. The DEPT triage respective eyeball triage characterized 32.3% vs. 37.3% of the patients as green, 39.0% vs. 44.6% as yellow, 26.7% vs. 16.2% as orange and 0.6% vs. 1.8% as red. Agreement described as Kappa was 0.05. Receiver operation characteristics (ROC) analysis of the prognostic value of DEPT and eyeball triage in relation to 30-day mortality showed that the area under the curve for DEPT triage was 0.62 (95% CI, 0.58-0.65) and 0.73 (95% CI, 0.70-0.76) for eyeball triage, $p < 0.01$. Analysis of 30-day mortality showed that the hazard ratio for patients categorized as yellow with DEPT triage was 1.7, orange 2.6, and red 19.1 (green is reference). The corresponding hazard ratios for eyeball triage were 2.4, 7.9, and 27.5. The negative predictive value of being green or yellow in relation to 30-day mortality was 97.6% (97.2-98.0) for eyeball triage and 96.8% (96.2-97.3) for DEPT, $p < 0.01$.

Conclusion: Agreement between DEPT and eyeball triage was poor. The clinical assessment by inexperienced hospital staff was a significant better prognostic marker with regards to 30-day mortality risk. This observation questions the value of systematic triage as used today.

A16

Ultrasound guided puncture of the radial artery for blood gas analysis: a prospective, randomized controlled trial

Christian B Laursen¹, Rasmus L Pedersen, Annmarie T Lassen
Department of Respiratory Medicine, OUH Odense University Hospital,
Odense, Denmark

E-mail: christian.b.laursen@rsyd.dk

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Background: Arterial puncture for arterial blood gas analysis (ABGA) is a procedure often performed in the emergency department (ED). Using ultrasound (US) guidance of the procedure as a routine could potentially increase the proportion of patients in which arterial puncture for ABGA is successful in the first attempt.

Methods: A prospective, parallel-group, randomized controlled trial was conducted in an emergency department. Patients being admitted to the ED or already admitted to the ED were included in the study if the physician attending the patient ordered an ABGA. Exclusion criteria were permanent mental disability, patient age < 18 years, patients declining to participate in the study or ABGA contraindicated. Patients were randomly assigned to arterial puncture using the standard procedure, or to US guided puncture. The primary endpoint of the study was the proportion of patients in which arterial puncture for ABGA was successful in the first attempt.

Results: 238 patients were included and randomized. 115 patients remained for analysis in the US group and 109 remained in the control group. The proportion of patients in which arterial puncture for ABGA was successful in the first attempt in the US group was the proportion of patients was 103 (89.6%), versus 103 (94.5%) in the control group ($p = 0.18$). The absolute and relative effect were -4.9% (95% CI: -12.5 to 2.5) and 0.95 (95% CI: 0.90-1.06) respectively.

Conclusion: In an emergency department setting, the routine use of US guided arterial puncture does not increase the proportion of patients in which arterial puncture for ABGA is successful in the first attempt, when compared to ABGA obtained by the conventional technique.

Trial registration: Registered at <http://clinicaltrials.gov> NCT01660724.

A17

Patient-rated level of discomfort during assessment with point-of-care ultrasonography

Christian B Laursen^{1*}, Erik Sloth², Annmarie T Lassen³, Jess Lambrechtsen⁴,
Daniel P Henriksen^{4,5}, Finn Rasmussen⁶

¹Department of Respiratory Medicine, OUH Odense University Hospital, Odense, Denmark; ²Department of Anesthesia and Intensive Care, Aarhus University Hospital, Skejby, Denmark; ³Department of Emergency Medicine, OUH Odense University Hospital, Odense, Denmark; ⁴Department of Medicine, OUH Odense University Hospital, Svendborg, Denmark; ⁵Institute of Clinical Research, University of Southern Denmark, Odense, Denmark;

⁶Department of Allergy and Respiratory Medicine, Near East University Hospital, Nicosia, North Cyprus, Mersin 10, Turkey

E-mail: christian.b.laursen@rsyd.dk

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Introduction: This study aimed to assess the patient-rated level of discomfort during point-of-care ultrasonography of the heart, lungs, and deep veins in a population of patients admitted to an emergency department with respiratory symptoms and to what extent the patients would accept being assessed by the use of point-of-care ultrasonography if they had to be examined for possible disease.

Methods: A questionnaire-based observational study was conducted in an emergency department. Inclusion criteria were one or more of the following: respiratory rate > 20/minute, oxygen saturation < 95%, oxygen therapy initiated, dyspnoea, cough or chest pain. Patients were examined by the use of point-of-care ultrasonography of the heart, lungs, and deep veins. Patient-rated level of discomfort and acceptance were assessed using a standardised questionnaire.

Results: A total of 1,130 patients were assessed for eligibility, of which 299 (26.5%) patients were included. 26 patients was not able to fill out the questionnaire and 2 patients withdrew informed consent, leaving 271 patients available for study analysis. The median duration of the sonographic examinations was 12 minutes (IQR 11-13, range 9-23). The median patient-rated level of discomfort for all three types of sonography was 1 (IQR 1-1, range 1-8) on a scale from 1 to 10. All but one patient (99.6% (95% CI: 98.9-100%)), would accept being examined by the use of point-of-care ultrasonography as a part of routine emergency department diagnostics.

Conclusion: The patient-rated level of discomfort during point-of-care ultrasonography of the heart, lungs, and deep veins is very low and the vast majority of patients would accept being assessed by the use of point-of-care ultrasonography if the patients once again had to be examined for possible disease.

A18

Hyponatremia as a prognostic factor for 30-day and 1-year mortality in patients acutely admitted to departments of internal medicine

Louise Holland-Bill^{1*}, Christian F Christiansen¹, Sinna P Ulrichsen¹, Troels Ring²,
Jens OL Jørgensen³, Henrik T Sørensen¹

¹Department of Clinical Epidemiology, Aarhus University Hospital, Aarhus, Denmark; ²Department of Nephrology, Aalborg University Hospital, Aalborg, Denmark; ³Department of Endocrinology and Internal Medicine, Aarhus University Hospital, Aarhus, Denmark

E-mail: louise.bill@clin.au.dk

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Background: Little is known about the prevalence and prognostic impact of hyponatremia among patients admitted acutely to departments of internal medicine. We examined the prevalence of admission hyponatremia (serum sodium < 135 mmol/l) and its association with 30-day and 1-year mortality overall and according to diagnostic groups of previous morbidities and primary discharge diagnoses. Furthermore, we set out to identify threshold values predicting increased mortality, by treating serum sodium as a continuous variable.

Methods: We used prospectively collected data from population-based registries to identify all first-time acute admission to departments of internal medicine in the Northern and Central Regions of Denmark from 2006 - 2011. We computed the prevalence of hyponatremia overall and for each hyponatremia category. Patients with hyponatremia and normonatremia were followed from the date of admission until death, migration, or up to one year. We used the Kaplan-Meier method (1 - the survival function) to compute 30-day and 1-year mortality. Relative risks with 95% confidence intervals (CIs), adjusted for age group, gender, and previous morbidities, and stratified by clinical subgroups were estimated by the pseudo-value approach.

Results: We identified 279,508 first-time acute admissions to departments of internal medicine in the study period. The prevalence of admission hyponatremia was 41,803 patients (15.0%), increasing with higher age and greater burden of previous morbidities. Thirty-day mortality was 3.6% in normonatremic patients compared to 7.3%, 10.0%, 10.4%, and 9.6% in

patients with serum sodium levels of 130-134.9 mmol/l, 125-129.9 mmol/l, 120-124.9 mmol/l, and <120 mmol/l, resulting in adjusted relative risks (RRs) of 1.4 (95% CI: 1.3 to 1.4), 1.7 (95% CI: 1.6 to 1.8), 1.7 (95% CI: 1.4 to 1.9), and 1.3 (95% CI: 1.1 to 1.5), respectively. One-year mortality in patients with hyponatremia ranged from 20.2% to 24.8% compared to 10.6% in patients with normonatremia, with corresponding adjusted RRs of 1.3 (95% CI: 1.3 to 1.3), 1.4 (95% CI: 1.4 to 1.5), 1.4 (95% CI: 1.3 to 1.5), and 1.3 (95% CI: 1.1 to 1.4). Hyponatremia was associated with increased mortality risk across virtually all diagnostic groups. Sodium values of 132 mmol/l to 139mmol/l yielded the steepest increase in mortality.

Conclusions: Admission hyponatremia, regardless of underlying morbidities, is associated with increased 30-day and 1-year mortality. The association with increased mortality seems independent of severity of hyponatremia.

A19

Changes in emergency department visits after introducing a triage and primary care consultation telephone service

Jakob L Forberg^{1*}, Torben B Højmark², Leif P Jensen³

¹Department of Emergency Medicine, Hospital of Northern Zealand, Hilleroed, Denmark; ²Department of Health Data and Analysis, Hospital of Northern Zealand, Hilleroed, Denmark; ³Board of Directors, Hospital of Northern Zealand, Hilleroed, Denmark

E-mail: jakob@lundager.eu

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Background: In January 2014 the Capital Region introduced a single point of contact telephone service (1813) for all acute and non-emergent injuries and illnesses. In case of an acute injury, citizens are instructed to call 1813 (24/7) before attending the Emergency Department (ED). For telephone consultation or ED referral due to acute illness, citizens are instructed to call 1813 after general practice (GP) opening hours. Changes of ED visits in the early implementation phase were studied.

Method: ED visits at Hospital of Northern Zealand from the period February 1 to June 30 in 2013 and 2014 were compared. Data were retrospectively extracted from the patient administrative system. For Hillerød ED data was in addition extracted from the ED information system Cetrea. Out of hours primary care consultations at the hospital were not included. All patients with injuries were seen in the ED. Children less than 17 years of age with illness are treated in the paediatric ED and, thus, not included in the study.

Results: There was an overall increase in ED admissions from 16,277 to 17,456. Admissions during GP opening hours and out of hours, increased with 4.8% and 9.0%, respectively. Patient transfers between specialties after admissions decreased significantly from 8.9% to 7.7%. Ambulatory ED visits increased from 26,908 to 27,819. Visits due to orthopaedic injuries in Hillerød ED increased by 2%. The distribution of arrival time for acute ambulatory visits was significantly changed. The amount of patients arriving at 10-13 o'clock decreased and the amount at 21-23 o'clock increased.

Conclusions: In the early implementation phase of the 1813 service ambulatory and orthopaedic ED visits had not yet decreased. The amount of admissions increased. The rise in admissions was higher during the hours when 1813 mainly refers to the ED. A rise in admission during GP opening hours contributed to the overall increase. The arrival rate during peak arrival hours was slightly reduced. In order to reduce ED crowding further effort is needed to reduce low risk ED visits and to match the arrival rate of low risk patients with ED capacity and available competencies.

A20

Ability of emergency physicians to diagnose acute coronary syndrome on the ECG of acute chest pain patients

Catarina E Hilmersson^{1*}, Jonas Björk², Mattias Ohlsson³, Ulf Ekelund¹

¹Department of Emergency Medicine, Skåne University Hospital, Lund, Sweden; ²Region Skåne Competence Centre for Clinical Research, Lund, Sweden; ³Computational Biology and Biological Physics Group, Lund University, Lund, Sweden

E-mail: catarina.ellehuus_hilmersson@med.lu.se

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Background: Interpretation of the ECG is central to the diagnosis of acute coronary syndrome (ACS) in emergency department (ED) chest pain patients. Failure to recognize ECG signs of cardiac ischemia is a common cause of missed ACS. This study aimed to investigate ED doctors' ability to diagnose ACS based solely on ECGs from ED chest pain patients.

Methods: 80 male and female ED physicians each received 20 ECGs and answered two questions for each ECG: #1 "Will this patient's discharge diagnosis be ACS?" (yes/no), and #2 "On a scale of 0-100, how likely is it that the patient will be discharged with an ACS diagnosis?" Data on each physician's gender, experience, and daily practice in ECG reading were collected. Physicians' answers were assessed for correctness when compared to discharge diagnosis and expert ECG interpretation, respectively.

Results: The physicians' sensitivity and specificity for ACS were 67% and 75% when compared with discharge diagnosis, and 100% and 74% when compared with expert ECG interpretation. Female physicians showed a significantly higher sensitivity for ACS than male physicians (medians 75 vs. 50%; $p = 0.038$) when compared with discharge diagnosis, but not with expert interpretation. On a scale of 0-100, female physicians assigned a higher ACS likelihood than male physicians irrespective of the patient's discharge diagnosis, and also in patients the physician did not believe to have ACS. ROC-area was not significantly different for male and female physicians. There was no difference in diagnostic ability based on work experience and number of ECGs read daily.

Conclusion: Female ED physicians correctly identified more patients who were discharged with ACS than their male colleagues, probably explained by a tendency to assign a higher likelihood of ACS. ED physicians' ECG interpretation correlated better with expert interpretation than discharge diagnosis, which indicates that even a well interpreted ECG cannot reliably predict an ACS discharge diagnosis. There was no gender difference in the overall ability to diagnose ACS on the ECG, and further studies are needed to elucidate if gender differences in ECG interpretation translate into differences in clinical decision-making.

A21

Impact of socioeconomic status on mortality and morbidity in patients with severe sepsis and septic shock

Amal Schnegelsberg^{1*}, Julie Mackenhauer^{1,2}, Marie Jessen¹, Helle L Nibro³, Pia Dreyer⁴, Hans Kirkegaard^{1,4}

¹Research Center for Emergency Medicine, Aarhus University Hospital, Aarhus, Odense, Denmark; ²Department of Anaesthesiology, Regional Hospital of Randers, Randers, Denmark; ³Intensive Care Unit, Aarhus University Hospital, Aarhus, Denmark; ⁴Department of Anaesthesiology and Intensive Care Medicine, Aarhus University Hospital, Skejby, Denmark

E-mail: ahs@clin.au.dk

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Background: Previous studies on sepsis have focused on early identification and mortality, while studies examining the association between socioeconomic status (SES) and mortality and morbidity in septic patients are sparse.

Methods: We conducted a historical cohort study at the Intensive Care Unit (ICU), Aarhus University Hospital. All adult patients admitted to the ICU with severe sepsis or septic shock from 2008-2010 were included. Transfers from other ICUs and patients with limited interventions (DNI/DNR) were excluded. Data on patient SES (educational level and personal income), Charlson Comorbidity Index (CCI), readmissions, and mortality were obtained from public registries. Through Kaplan-Meier curves and Cox proportional hazards models, we examined the effect of SES on in-hospital mortality, 1-year all-cause mortality, and time to first acute readmission within one year.

Results: 388 patients were included. Median age was 64 years IQR [55-74], 53% were men. 47% were admitted directly from the emergency department (ED). Median CCI was 2 IQR [1-3], median SAPS II was 40 IQR [30-53]. 52% had septic shock within 24 hours of admission. 1-year mortality in the entire cohort was 46%, of these 61% died in-hospital. Kaplan-Meier curves for in-hospital mortality ($n = 388$) showed a significant association to income category with a hazard ratio (HR) of 1.59 (95% CI [1.0; 2.5]). Curves for 1-year mortality ($n = 278$) showed a tendency of worse outcome among the lowest SES groups with the strongest trend in income categories. After adjusting for demographic characteristics, CCI, LOS and SAPS II, the low

income group had a significantly increased HR of 1.88 (95% CI [1.0; 3.4]) compared to high income group for 1-year mortality.

56% of hospital survivors experienced a readmission within one year from discharge. Kaplan-Meier curves showed a consistent trend towards reduced time to readmission in the low compared to the higher groups for both income and education.

Conclusion: Our data suggest that low income affects in-hospital mortality. After discharge, patients in the low income category and with low educational level have a tendency towards higher 1-year mortality as well as reduced time to readmission.

A22

Incidence and mortality of hypotension in the emergency department; an 12-year population based study

Jon G Holler¹, Daniel P Henriksen², Søren Mikkelsen³, Court Pedersen⁴, Annmarie Lassen¹

¹Department of Emergency Medicine, OUH Odense University Hospital, Odense, Denmark; ²Department of Clinical Chemistry & Pharmacology, OUH Odense University Hospital, Odense, Denmark; ³Department of Anesthesiology and Intensive Care Medicine, OUH Odense University Hospital, Odense, Denmark; ⁴Department of Infectious Diseases, OUH Odense University Hospital, Odense, Denmark

E-mail: Jon.Gitz.Holler@dadlnet.dk

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Background: One of the symptoms of shock is hypotension. Incidence and mortality of unselected patients with hypotension in the Emergency Department (ED) is unclarified. The aim was to describe the incidence rates and overall mortality of hypotensive patients in the ED in an 12-year period.

Methods: We identified all patients aged ≥ 18 years with a first time presentation to the ED with hypotension within the study period. Patients were included if their initial systolic blood pressure (SBP) recording was below 100 mmHg upon arrival to the ED of Odense University Hospital, Denmark, during the study period (1st January 2000 to 31st December 2011). We excluded patients if they did not have a valid unique personal identification number or lived outside the hospital's catchment-area. The study population was linked to several population-based registers using the unique Danish personal identification number in order to determine comorbidity and overall mortality proportions. Incidence rates (IRs) were calculated per 100,000 person years at risk (pyar) and presented as crude annual rates.

Results: We identified 3,378 cases with a median age of 68 years (IQR 51-80); 1,716 (50.8%) were men, and 872 (25.1%) had Charlson Comorbidity Index > 2 . The median SBP was 91 mmHg (IQR 84-96). The IRs of hypotension ranged from 124/100,000 pyar (95% CI: 109-139) in 2000 to 174/100,000 pyar (95% CI: 158-192) in 2011. The IRs showed a stationary trend between 2000-2008 (Median IR; 128/100,000 pyar), but increased during the years 2009-2011 (Median IR; 164/100,000 pyar). The IRs according to age groups showed an increasing trend with 50/100,000 pyar (95% CI: 45-55) among age 18-39 years to 1028/100,000 pyar (95% CI: 952-1109) among age 85+ years. The overall 7-day and 90-day mortality was 521 (15.4%) and 966 (28.6%) respectively with a stable trend throughout the period. Highest 90-day mortality was 518 (38.1%) among age 65-84 years compared to lowest mortality of 20 (4.2%) among 18-39 years during the period.

Conclusion: During the period 2000-2011 the crude incidence of hypotension have increased, especially during the years 2009-2011 with increasing incidence rates among the elderly. The overall 7-day and 90-day mortality was 15.4% and 28.6% respectively.

A23

Prescription of medication before and after acute admission with nonspecific abdominal pain

Lena Boulakh¹, Morten Lamberts², Hanne Jørsboe¹

¹Akutfdelingen, Nykøbing F. Sygehus, Nykøbing Falster, Denmark;

²Kardiologisk Afdeling, Gentofte Sygehus, Gentofte, Denmark

E-mail: lenbo@regionsjaelland.dk

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Background: Abdominal pain is among the most common symptoms leading to referral to emergency departments in Denmark. Many of these patients are discharged without a specific diagnosis despite thorough work-up. We set out to assess the drugs prescribed to these patients in order to identify preconditions prior to admission based on their pharmaceutical treatment. This aims to generate hypotheses of admission causes derived from the drugs the patients have been prescribed since knowledge of drugs consumption patterns can improve treatment regimes. **Methods:** National databases of patient registry (ICD-10 code R10) and prescriptions were used to identify use of medication in patients (age 16-100) admitted to hospital with abdominal pain in 2010. Exclusion criteria were surgical procedure work-up or diagnosis of gastrointestinal, renal, or gynecological disease one year prior to admission. Medical use at two time points was recorded: 90 days prior to admission and 90 days after discharge. New users were defined as no prescription of the same drug 90 days prior to admission. Particular attention was made to antibiotics, oral analgesics, and antacids. Data is presented as numbers and percentages.

Results: Nationwide, 12,081 patients were discharged with a ICD-10 code of "acute abdominal pain" (64.4% women, 35.6% men). Prior to admission, the percentage of patients using the symptomatic medications was: Oral analgesics 16.1% and antacids 21.2%. After discharge there was a significant number of new users of: oral analgesics 48.5%, especially NSAIDs and opioids, and antacids 47.2%. Of special interest is that patients were prescribed antibiotics at both times; before 19.5% and after 63.8% ($p < 0.05$).

Conclusion: A substantial proportion of the patients collected a prescription of antibiotics, painkillers, and antacids. Further investigations of chart reviews and knowledge of the processes of clinical decision-making are needed to establish if it is an unrestricted prescription policy rather than an appropriate work-up. Additional studies of side effects and prescription profiles could provide insights to the symptoms leading to admission.

A24

The use of specific para-clinical examinations in patients presenting with dyspnea

Marie Krogh Nielsen^{1*}, Anja Strehlau², Mikkel Brabrand^{1,3}

¹Department of Medicine, Sydvestjysk Sygehus, Esbjerg, Denmark;

²Department of Medicine, OUH Svendborg Sygehus, Svendborg, Denmark;

³Department of Emergency Medicine, OUH Odense University Hospital, Odense, Denmark

E-mail: mariekroghnielsen@gmail.com

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Background: A large, and growing, number of patients are admitted and treated acutely at emergency departments. In Denmark, the number of acute admissions has increased 15% from 2006 to 2012. The Region of Southern Denmark has begun a process to prepare a regional concept for the Emergency Departments. Therefore, it is of interest to observe our behaviour as physicians in the use of para-clinical examinations. If every patient who enters the emergency department with dyspnea ends up having a chest X-ray, arterial blood gas analysis (BGA), or electrocardiogram (ECG) performed, the natural consequence would be to do them initially at arrival. We performed the present study with the objective to quantify the use of specific examinations on patients presenting with identical primary complaints.

Methods: We conducted this as a prospective observational cohort study. All patients admitted at the medical admission unit at the Hospital of South West Jutland from 1 July until 31 October 2012 were registered with their subjective primary complaint by the admitting nurse. From the department of radiology and the department of clinical biochemistry, data was extracted on all examinations performed, and matched with the registered individuals.

Results: We registered 5,966 contacts (4,782 individual patients). Of these, 946 (15.8%) presented dyspnea as the primary complaint. 56.8% had chest X-rays performed, 61.1% had blood gas taken and 73.9% had performed electro-cardiography within the first 24 hours of admittance. Furthermore, standard biochemistry including haemoglobin (hgb), creatinine (crea), and C-reactive protein (CRP), was measured in 81.2% of the cases. Blood culture tests were done in 36.8% of admissions. There was no significant difference

in the use of para-clinical examinations when patients were readmitted during the observation period.

Conclusion: When planning the admission process at the medical admission unit, attention should be paid to the fact that not all patients with acute dyspnea are, according to the admitting doctors, in need of an acute X-ray, BGA, ECG, or blood samples. If all patients presenting with dyspnea should be examined including these parameters, it would require a significant extra capacity.

A25

High use of antibiotics in elderly patients at discharge after hospitalization for acute abdominal pain

Jakob S Jensen*, Helle L Ipsen, Hanne Jørsboe
Emergency Department, Nykøbing-Falster Hospital, Nykøbing-Falster,
Denmark

E-mail: jsoj@regionsjaelland.dk

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Background: 8% of the annual discharges at our hospital of Nykøbing-Falster (NFS) are registered as acute abdominal pain. A former study in our department based on national data has demonstrated a high use of painkillers, antibiotics, and antacids in these patients. We want to investigate if there is a difference in the drug consumption before and after hospitalization due to unspecific abdominal pain, in patients aged 18-60 compared to patients aged 80+.

Methods: A retrospective audit study was performed in a group of younger patients (20-60 years) and a group of elderly (80+ years) with unresolved abdominal pain before and after admittance to NFS in 2012. Patients were included with a discharge code of acute abdominal pain without any explanation (ICD-10 code R10). We assessed the use of medication on the admission day and new drugs prescribed at discharge supplemented with duration of hospitalization, frequency of re-admittance within 30 days, 30 days mortality rate, and correct disease-coding. The following groups of drugs were studied; antibiotics, painkillers, and antacids including H2-antagonists. In 16 of 74 cases in the elderly and 3 of 74 cases in the young, we found a specific diagnosis and their data was excluded.

Results: The study included 71 patients (20-60 years), mean age 37 years, and 58 patients (80-99 years) mean age 85 years. The 80+ year patients versus the younger had a longer length of stay, at 4.67 days (1-65) versus 2 days (1-12), readmission rate was higher at 28% versus 10.8% and mortality rate was 19% versus 0%. In general, the elderly were prescribed more medication at arrival and increased at discharge compared to the younger. The elderly had a significantly increase in new antibiotics from 7% at admission to 28% at discharge.

Conclusion: We found that the elderly patients had a very high mortality rate. They were discharged without explanation for their abdominal pain, but had prescribed more new symptomatic medication as painkillers and antacids compared to the younger. As a new finding, we showed that the elderly in 28% of the cases were treated with antibiotics at discharge. Whether this is a bias to wrong disease coding or to symptomatic use of antibiotics with weak indications need further investigation.

A26

Increased short-term mortality among normothermic patients presenting to a medical emergency department with infection - a cohort study

Daniel P Henriksen¹, Helene CK Jensen¹, Christian B Laursen²,
Annmarie T Lassen¹

¹Medical Emergency Department, OUH Odense University Hospital, Odense,
Denmark; ²Department of Respiratory Medicine, OUH Odense University
Hospital, Odense, Denmark

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Background: Infections are frequent causes of medical admissions to the emergency department (ED). However, not all infected patients present with fever (>38°C). The aim of the study was to assess differences in short-term mortality among patients hospitalized with community-acquired infection presenting with and without fever.

Methods: All adult patients (≥15 years) with a first-time admission at a medical ED between September 2010-August 2011 with community-acquired infection were included. Cases were identified by manual chart review using predefined criteria of infection. Data on vital signs, laboratory values and antibiotic treatment were obtained electronically. We excluded unidentified patients and patients residing outside the hospitals catchment area. To assess if the absence of fever (normothermia: 36.0-38.0°C) is an independent prognostic factor, we computed multiple Cox regression analyses, adjusted for different potential confounders.

Results: 1,901 patients with infection, treated with antibiotics within 24 hours after arrival, were included. Median age was 74 years (5-95% range: 29-92 years); 896 (47.1%) were males, and 811 (42.7%) presented with a Charlson Comorbidity Index >2; 49.7% were normothermic at arrival and 50.3% presented with fever. Thirty-day mortality was 9.3% (95% CI: 7.5-11.3%) among patients with fever and 18.1% (95% CI: 15.7-20.7%) in normothermic patients. The unadjusted hazard ratio (HR) of death within 30 days after admission in normothermic infectious patients was 2.2 (95% CI: 1.7-2.8) compared to infectious patients with fever, adjusted HR 2.0 (95% CI: 1.6-2.6).

Conclusion: Normothermic patients admitted with an infection were twice as likely to die within 30 days after admission compared to infectious patients admitted with fever.

A27

Patients hospitalized with severe infections and hypothermia, a cohort study of mortality and prognostic factors

Daniel P Henriksen¹, Christian B Laursen², Annmarie T Lassen¹

¹Medical Emergency Department, OUH Odense University Hospital, Odense,
Denmark; ²Department of Respiratory Medicine, OUH Odense University
Hospital, Odense, Denmark

E-mail: christian.b.laursen@syd.dk

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Background: Hypothermia is a predictor of death in patients admitted to the hospital. Although hypothermia is associated with a bad prognosis, the absolute risk in patients admitted with severe infections is unknown.

Methods: Prospective follow-up of all patients admitted to a medical emergency department (ED) from 1 August 2009-31 August 2011. Patients were included the first time they presented with severe infection in the study period. Hypothermia was defined as a rectal temperature below 36.0°C. Patients without a measured rectal temperature at arrival were excluded. Severe infections were defined as a discharge diagnosis indicating infection as well as presence of organ failure. To assess whether hypothermia was an independent prognostic factor, we computed multivariable logistic regression analysis, adjusted for different potential confounders.

Results: A total of 3,563 patients presenting with severe infections were included, median age 75 years (5-95% range: 33-92 years), 47.9% were males, 47.9% had Charlson Comorbidity Index>2. 147 (4.1%) presented with hypothermia. The most common site of infection among hypothermic patients with severe infection was the lower respiratory tract (83/147, 56.5%). The crude thirty-day mortality in patients with and without hypothermia was 27.9% (95% CI: 20.8-35.9%) and 14.4% (95% CI: 13.3-15.7%) respectively. The hazard ratio for 30-day mortality adjusted for sex, age, comorbidity, and number of organ failures was 2.1 (95% CI: 1.4-3.2) compared to patients with severe infections without hypothermia.

Conclusion: Despite only few patients admitted to a medical ED with severe infections were hypothermic at arrival, it is an important clinical finding and independent prognostic factor of short-term mortality.

A28

Risk of readmission following admission with community-acquired sepsis to a medical emergency department - a follow up study

Daniel P Henriksen^{1*}, Christian B Laursen², Annmarie T Lassen¹

¹Medical Emergency Department, OUH Odense University Hospital, Odense, Denmark; ²Department of Respiratory Medicine, OUH Odense University Hospital, Odense, Denmark

E-mail: Daniel.pilsgaard.henriksen@rsyd.dk

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Background: Sepsis is a common cause of admission to the hospital, and an increasing proportion of patients survive to discharge. Knowledge regarding risk of readmission might be of value in planning rehabilitation and follow up of these patients.

Methods: We included all adult patients (≥ 15 years) with a first-time admission of community-acquired sepsis of any severity at a medical Emergency Department (ED) between September 2010 and August 2011 and who survived to discharge. Cases were identified by manual chart review using predefined criteria of infection. Data on vital signs, laboratory values, and antibiotic treatment were obtained electronically. We computed the median time to readmission and combined the severe sepsis and septic shock category due to the low number of patients with septic shock ($N = 14$). We used the Wilcoxon Rank-Sum test to test whether there was any difference in the median time to readmission among patients discharged after an admission with sepsis compared to severe sepsis/septic shock. Patients were followed until death, emigration, readmission to the hospital, or 90 days after discharge with sepsis of any severity, whichever came first.

Results: A total of 1,713 patients were admitted with sepsis of any severity, and 1,542 (90.0%) were discharged. Within the first 90 days after discharge, 520 (33.7%) patients were readmitted, 84 (5.5%) died before being readmitted to the hospital, and 2 (0.1%) emigrated. A total of 178/600 (29.7%) patients discharged after an admission with sepsis were readmitted within 90-days after discharge and 342/942 (36.3%) were readmitted after severe sepsis/septic shock ($p = 0.007$). The median time of readmission was 21 days (IQR 8-44 days) among patients discharged after a hospitalization with sepsis and 20 days (IQR 8-41 days) in severe sepsis/septic shock ($p = 0.691$).

Conclusion: One third of patients who survived an admission with sepsis of any severity were readmitted to the hospital within 90 days after discharge, and patients with severe sepsis/septic shock were more likely to be readmitted than patients with sepsis. There was no difference in the time to readmission when comparing patients discharged after sepsis and severe sepsis/septic shock.

A29

Active surveillance of Methicillin-resistant *Staphylococcus aureus* in an emergency department: Comparing BD MAX StaphSR kit with the routine MRSA identification method

Poul Kjældgaard¹, Christian B Morgensen², Lilli Ø Skov¹, Ming Chen^{1*}

¹Department of Clinical Microbiology, Southern Jutland Hospital, Aabenraa, Denmark; ²Emergency Department, Southern Jutland Hospital, Aabenraa, Denmark

E-mail: ming.chen@rsyd.dk

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Background: The area our hospital serves has a high prevalence of pig-MRSA and is situated close to Germany where there is a higher MRSA prevalence than in Denmark. The aim of the study was to describe the MRSA colonization among acutely admitted patients to the Emergency Department (ED) and to evaluate the BD MAX StaphSR screening kit versus our routine MRSA identification method.

Methods: Prospective observational study performed at the ED. Nasal and throat swab specimens from all patients > 10 years who were admitted to the ED from 01.09.2013 to 30.11.2013, were examined. The swabs were, immediately after sampling, incubated in 6% NaCl broth for at least 16 hours and further cultivated on MRSA-chrome- and Columbia-agar. 150 ml of the incubated broth was used as sample material for StaphSR.

Results: A total of 1,246 patients were included. In 11 patients (0.9%), MRSA was detected by our routine method, 5 isolates were pig-MRSA (CC398/T034), 4 Northern Germany MRSA in two different strains (CC22/t223 and CC5/t002), both having induced several MRSA-outbreaks in hospitals in Southern Denmark in last years. The last 2 strain were not formerly identified (CC45/t015 and CC88/t5147). 10 of the MRSA isolates were identified by the StaphSR kit, sensitivity 91% (95% CI: 62-98%) and specificity 98% (97-99%). 26 of the StaphSR results were false positive, mostly caused by presence of non-MRSA *S. aureus*, in 4 cases *S. epidermidis*, and in 7 cases a combination of non-MRSA *S. aureus* and *S. epidermidis*, resulting in a positive predictive value of the StaphSR kit of 28% (16-44%) StaphSR seemed to be sensitive to the amount of inoculum used. The 26 false positive results were reduced to 6 when adjusting the inoculum to 50 ml.

Conclusions: The prevalence of MRSA in our ED was 0.9%, mainly with Pig-MRSA and Northern Germany MRSA strains. StaphSR detected most of the culture positive samples, but gave nearly three times as many false positive results. All positive results should be confirmed and StaphSR kit cannot be recommended as the only method for MRSA detection.

A30

MRSA screening in emergency department detects a minority of MRSA carriers

Christian B Mogensen¹, Poul Kjældgaard^{2*}, Lilli Ø Skov², Charlotte Jensen¹, Ming Chen²

¹Emergency Department, Southern Jutland Hospital, Aabenraa, Denmark;

²Department of Clinical Microbiology, Southern Jutland Hospital, Aabenraa, Denmark

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Background: Methicillin-resistant *Staphylococcus aureus* (MRSA) is an emerging problem in Denmark. The National Board of Health (NBH) has issued a screening tool to identify risk situations for admitted patients, consisting of three parts: questions concerning general risk situations, special risk situations, and individual risk factors. All patients should answer the general risk situation questions, the special risk, and risk factor on indication and be tested for MRSA if a risk situation is identified. Since the majority of all acute patients are admitted to the emergency departments (ED), the ED plays a key role in prevention of in-hospital spreading of MRSA. The aim of this study was to estimate the prevalence of MRSA among all acutely admitted ED patients and to evaluate the ability of the NBH screening tool to detect MRSA patients.

Methods: All patients more than 10 years, acutely admitted to the ED in the Hospital of Southern Jutland during a three months period were requested to answer all the NBH questions and a nasal and pharyngeal swab was obtained for MRSA culture.

Results: 1,945 patients above 10 years were admitted, 1,660 patients (85%) were asked to participate and 1,220 accepted (63% of all admissions). 11 patients had MRSA (0.9%). The performance of the general risk situation screening to detect MRSA carriers was: sensitivity 18% (95% CI: 2-52%), specificity 96% (94-97%), positive predictive value (PPV) 4% (0.4-12%) and negative predictive value (NPV) 99% (99-99.6%), likelihood ratio for positive test (LHR+) 4.0 (1-14) and likelihood ratio for negative test LHR(-) 0.9 (0.7-1.1). For the combined general, specific, and individual risk factors the sensitivity was 46% (17-77%), specificity 60% (57-63%) PPV 1% (0.3-2.4%) NPV 99% (98-99.7%), LHR (+) 1.1 (0.6-2) and LHR (-) 0.9 (0.5-1.6).

Conclusion: In this ED 0.9% of the patients had MRSA. Less than every fifth will be detected by the general screening questions and less than half if all general, specific, and individual questions are used. We conclude that the majority of MRSA carriers acutely admitted to the ED will remain undetected.

A31

SuPAR - A future prognostic biomarker in emergency medicine

Rebecca M Østervig^{1,4*}, Lars Køber², Jakob L Forberg⁴, Lars S Rasmussen¹, Jesper Eugen-Olsen³, Kasper Iversen^{4,5}

¹Department of Anaesthesia, Centre of Head and Orthopaedics, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark;

²Department of Cardiology, Rigshospitalet, University of Copenhagen, Copenhagen, Denmark; ³Clinical Research Centre, Hvidovre Hospital,

University of Copenhagen, Copenhagen, Denmark; ⁴Department of Emergency Medicine, Hospital Of Northern Zealand, Hillerød Hospital, Hillerød, Denmark; ⁵Department of Cardiology, Herlev Hospital, University of Copenhagen, Copenhagen, Denmark
E-mail: rebeccaostervig@hotmail.com
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Background: Efficient triage in the Emergency Departments (ED) is important to identify patients in need of urgent care. Biomarker measurements may aid these clinical decisions. suPAR, soluble urokinase-type plasminogen activator receptor, is a non-specific biomarker reflecting inflammation and is a strong prognostic marker for several diseases. This study investigated suPAR's predictive capacity to identify high- and low-risk patients in the Emergency Department.

Method: This study was part of a prospective cohort study carried out at Hillerød University Hospital (TRIAGE-study). The prognostic value of suPAR was compared to the prognostic value of triage category based on the information from the systematic triage tool, Danish Emergency Process Triage (DEPT) in prediction of 30-days mortality. Blood samples were taken upon arrival to the ED. Patients admitted to the ED from September 2013 to December 2013 were included in the study. suPAR levels were measured in EDTA-plasma using the CE/IVD approved suPARnostic ELISA (ViroGates, Denmark).

Results: Serum was available for analysis of suPAR in 5,992 patients (94% of the admitted patients). Mean age was 59.8 years and 50.1% were female. The mean concentration of suPAR was 5.5 ng/ml (\pm 3.6) and there was a significant correlation between suPAR level, CRP level ($R^2 = 0.09$), and leucocyte count ($R^2 = 0.02$), $p < 0.01$ for both. Mortality at 30 days was 3.6%. ROC analyses of the prognostic value of suPAR in relation to 30-day mortality showed that the area under the curve (AUC) was 0.85 (95% CI 0.82-0.87), similar analyses of the triage category showed an AUC of 0.62 (95% c.i. 0.58-0.66). Cox regression analysis of 30-day mortality in relation to suPAR quartiles showed that the hazard ratio for the second quartile was 2.2, third quartile 6.5, and highest quartile 38.4 ($p < 0.001$). In a multivariable analysis including gender, age, CRP, leucocyte count, and triage category, suPAR remained an independent predictor of 30-day mortality with a hazard ratio for second quartile of 4.5, third quartile 8.3 and highest quartile 26.9.

Conclusion: In unselected patients admitted to an Emergency Department, suPAR is an independent marker of short-term mortality. suPAR could potentially help clinicians in the initial risk assessment of acutely admitted patients.

A32

Is S-upar level correlated to the length of hospitalization

Esben K Baymler, Ina K Jensen, Mathias B Danielsen, Astrid J Damgaard, Kjeld A Damgaard

Emergency Medicine Department, Hospital of Vendsyssel, Denmark
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Background: The purpose of this study is to investigate if S-uPAR correlates with expected length of patients' hospitalization. This could be useful in emergency medicine, due to the acute departments treating patients hospitalized for 48 hours or less. S-uPAR (Urokinase Plasminogen Activator, CD87) is a potential biomarker thought to be related to inflammatory immune cell activation. It is expressed on various immune cells including neutrophils, monocytes, macrophages, and lymphocytes. Upon inflammation, it is cleaved from the cell surface and released into serum. S-uPAR has shown prognostic and clinical value in the triage of patients as described in an editorial comment in the *Journal of Internal Medicine* 2012 [1].

Methods: It is a follow-up study including 60 unselected patients ($n = 60$) above 60 years of age and is the first sample of a larger study including 500 patients. Blood samples in this study have been collected from patients at admission. The samples were frozen afterwards and the patients have been examined retrospectively by physicians and stratified into groups: hospitalized < 24 hours, 24-72 hours, and > 72 hours.

Results: The mean S-uPAR value for the < 24h group ($n = 14$) was 2.75 (1.5 - 24.3). This compared to the 24-72h group ($n = 13$) with a mean value of 4.3 (3.4-16.9) and the > 72h group ($n = 29$) with a mean value of 4.1 (0.8-18.7).

Conclusion: Patients hospitalized < 24h have lower S-uPAR values compared to patients hospitalized >24h. Preliminary findings of the study show no correlation between the patients S-uPAR values and the length of hospitalization. When all 500 patients have been included, further analysis will be conducted, including analysis of patients presenting very high and very low S-uPAR values to exclude those with known confounders.

Reference

1. Koch A, Tacke F: Risk stratification and triage in the emergency department: has this become 'suPAR' easy? *Journal of Internal Medicine* 2012, **272(3):243-246**.

A33

Lactate level, etiology, and mortality of adult patients in an emergency department: a cohort study

Mathilde Pedersen[†], Vibeke Brandt[†], Jon G Holler, Annmarie T Lassen
Department of Emergency Medicine, OUH Odense University Hospital, Odense, Denmark

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Background: Increased lactate is associated with high mortality among patients in the emergency department (ED) with suspected infection or trauma, but the association to patients with other etiologies is less well described. The aim of this study was to describe the relation between lactate, etiology, and 7-day mortality in adult ED patients.

Methods: A retrospective cohort study of all adult patients who had lactate measured within 4 hours after arrival to the ED at Odense University Hospital between June 2012 and May 2013. The categorization of suspected etiology was based on discharge diagnoses.

Results: 5,360 patients were included. 51.7% were male, and the median age was 67 years (IQR 50-79). 77.2% had low lactate (0-1.9 mmol/L), 16.2% intermediate lactate (2-3.9 mmol/L), and 6.6% high lactate (≥ 4 mmol/L). 7-day mortality was 2.9% (95% CI 2.4-3.5%) for patients with low lactate, 7.8% (95% CI 6.1-9.8%) for patients with intermediate lactate, and 23.9% (95% CI 19.6-28.8%) for patients with high lactate. There was a significant trend for increasing 7-day mortality with increasing lactate among patients with a discharge diagnosis categorized as infectious ($N = 1,133$), cardiologic ($N = 357$), respiratory ($N = 633$), hypovolemic ($N = 205$), or gastrointestinal ($N = 222$). Whereas patients with neurologic ($N = 391$) or nephrologic/hepatologic discharge diagnoses ($N = 94$) showed no trend.

Conclusion: Among adult ED patients there is increasing 7-day mortality with increasing lactate level in most patient categories, but patients who are discharged with neurologic- or nephrologic/hepatologic ICD-10 codes have no such trend.

A34

Lifestyle-related disease in an emergency department setting

Emilie Bækgaard[†], Thomas A Schmidt
The Emergency Department, Holbaek Hospital, Copenhagen University Hospital, Copenhagen, Denmark
E-mail: emiliesbaekgaard@gmail.com

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Background: According to the WHO, non-communicable (non-infectious) diseases account for 90% of all deaths in Denmark. The development of these diseases can often be contributed to lifestyle factors, namely diet, smoking, and alcohol, and, in association with these, type 2 diabetes, hypertension, and hypercholesterolaemia. One could argue that much of the burden of non-communicable disease actually is preventable disease, and, as such, could be eliminated through modification of lifestyle elements. The purpose of this project was to map the incidence of admissions attributable to lifestyle-related diseases, during November and December 2012 at a Danish Acute Admissions Department.

Methods: Every patient contact is given a diagnostic code upon leaving (at discharge or transfer elsewhere). A pre-determined list of diagnostic codes, covering admissions related to alcohol, chronic obstructive

pulmonary disease, ischaemic heart disease, cerebrovascular disease, type II diabetes, and recreational drug use, was created. Patient statistics were acquired from the departments' statistical database, with permission from the Danish Data Protection Agency. Furthermore, medical records for all patients admitted to the hospital during a randomly selected 24-hour period (within the study time) were examined manually, in order to identify lifestyle-related elements as risk factors, and, indeed, complicating factors, for disease. These were analysed to produce an overview of 'lifestyle-related' patient contacts.

Results: 6,699 patient contacts were analysed. 320 patients were admitted purely on the basis of a lifestyle-related disease, corresponding to one patient every 4-6 hours, 24 hours a day, 7 days a week.

During the 24-hour period, however, 14 patients (out of 89 admitted, 12.5%) fit the criteria - corresponding to one patient every 102 minutes. Furthermore, 67% of patients seen in those 24 hours had one or more lifestyle-related risk factors.

Conclusions: Lifestyle-related diseases account for the majority of deaths in Denmark, and constitute an important source of admissions too. Over two-thirds of patients admitted through this department have at least one lifestyle-related comorbidity or risk factor; and 12.5% of admissions are potentially preventable.

A35

Lack of diuresis four hours prior to admission is associated with increased mortality in acutely admitted medical patients

Mikkel Brabrand^{1,2,3}, Daniel P Henriksen⁴

¹Emergency Department, Sydvestjysk Sygehus, Esbjerg, Denmark; ²Emergency Department, OUH Odense University Hospital, Odense, Denmark; ³Institute of Regional Health Research, University of Southern Denmark, Odense, Denmark; ⁴Department of Clinical Chemistry and Pharmacology, Odense University Hospital, Odense, Denmark
E-mail: mbrabrand@health.sdu.dk

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Background: When patients become hypotensive, the kidneys and brain are the first organs to be affected. A key symptom of hypo-perfusion of the kidneys is reduced diuresis. Patients will experience this as less frequent visits to the toilet. The aim of the study was to assess if there was an association between reduced frequency of toilet visits and short-term mortality.

Methods: We included all consecutively admitted medical patients to the medical admission unit at Sydvestjysk Sygehus Esbjerg from October 2008 through February 2009. Upon arrival, a nurse registered their demographic details as well as vital signs and whether they had had any diuresis within the last four hours. After all patients had either died or been discharged, we extracted survival status from the Danish Civil Register. We calculated 1- and 7-day survival and using logistic regression, assessed the crude association between diuresis within the last four hours before admission and mortality. We also performed analyses to assess the association adjusting for age, systolic blood pressure and Charlson Comorbidity Index (CCI), all as continuous variables.

Results: We included 3,046 patients. 1,460 (48%) were female, and the median age was 66 (range 15-107) years. Information on recent diuresis was available for 1,859 (61%) patients. Of the 1,859 patients with information on diuresis, 283 (15%) experienced no diuresis within four hours up to arrival. The 1-day mortality was 0.8 (95% Confidence interval (CI): 0.5-1.3)%. Patients without diuresis within the last four hours had a crude odds ratio (OR) of 23.2 (95% CI: 6.5-82.8). Adjusting for age, systolic blood pressure, and CCI resulted in an OR of 18.0 (95% CI: 5.0-65.1). We found a 7-day mortality of 2.3% (95% CI: 1.7-3.1). Crude OR for 7-day mortality was 4.2 (95% CI: 2.3-7.8) and adjusted OR was 3.3 (95% CI: 1.7-6.2).

Conclusions: Among patients with a recording of diuresis, those without any diuresis within four hours before admission, have a significantly increase 1- and 7-day mortality compared to patients who have had diuresis. Our results are limited by small numbers of patients meeting the outcome.

A36

Acutely admitted medical patients have increasing one-year mortality with increasing age

Mikkel Brabrand^{1,2,3}, Daniel P Henriksen⁴

¹Emergency Department, Sydvestjysk Sygehus, Esbjerg, Denmark; ²Emergency Department, OUH Odense University Hospital, Odense, Denmark; ³Institute of Regional Health Research, University of Southern Denmark, Odense, Denmark; ⁴Department of Clinical Chemistry and Pharmacology, Odense University Hospital, Odense, Denmark
E-mail: mbrabrand@health.sdu.dk

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Background: The majority of patients admitted to a medical admission unit are old. Previous international studies have shown increased one-year mortality with increasing age. We performed the present study to clarify if the one-year mortality of Danish medical patients increased with increasing age.

Methods: We followed a cohort of all consecutive acutely admitted adult (15+ years) medical patients for one year after admission. The patients were admitted from October 2008 through February 2009 and February through May 2010 to the medical admission unit at Sydvestjysk Sygehus, Esbjerg. Only patients who were not Danish residents were excluded. We extracted survival status from the Danish Civil Register and calculated mortality at one year stratified by age in the groups 15-49, 50-64, 65-79 and 80+ years. We calculated both crude hazard ratios using Cox Proportional Hazard Regression analysis and adjusted for potential confounders: gender, comorbidity (using Charlson comorbidity index [CCI]) and the British national early warning score (NEWS) at time of admission.

Results: A total of 5,894 patients were admitted, 36 were not Danish residents and were excluded, leaving 5,858 patients for analysis. Median age was 65 (range 15-107) years, 2,923 (49.9%) were female, and 1,759 (30.0%) presented with severe comorbidity (CCI > 2). The crude one-year all-cause mortality was 18.6% (95% Confidence Interval [CI]: 17.6-19.6). The one-year mortality of patients 15-49 years was 2.5% (95% CI: 1.8-3.5), 50-64 years 13.3% (95% CI: 11.6-15.2), 65-79 years 23.8% (95% CI: 21.9-25.8) and 80+ years 37.2% (95% CI: 34.5-40.1). Crude hazard ratio for patients 50-64 years was 5.7 (95% CI: 4.0-8.1), 65-79 years 10.7 (95% CI: 7.6-15.1) and 80+ years 18.2 (13.0-25.6) compared to patients 15-49 years old. Adjusting for gender, CCI and NEWS, hazard ratios for patients 50-64 years old was 4.9 (95% CI: 3.1-7.6), 65-79 years 7.3 (95% CI: 4.7-11.1) and 80+ years 12.6 (95% CI: 8.2-19.4) compared to patients 15-49 years old.

Conclusions: One-year mortality for acutely admitted medical patients increased almost linearly with increasing age. Even patients aged 50-64 years had a significantly increased one-year mortality compared to patients 15-49 years old.

A37

Patient characteristics and patient flow in a small accident and emergency department

Mohamad Jawhara¹, Niels-Henrik Staalsen²

¹Surgical Department, Thy-Mors Hospital, Thisted, Denmark; ²Emergency Department, Thy-Mors Hospital, Thisted, Denmark
E-mail: jawharamd@gmail.com

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Background: Only few data exist on patient characteristics and flow within Acute & Emergency departments (A&E) in Denmark. Neither do we have solid data on the effectivity, i.e. how many patients are readmitted with the same diagnosis within a short time.

Aim: To provide data on patient characteristics and patient flow within our A&E department.

Methods: The study period was from February 1st until May 30th 2014. All patients admitted to our department (3,006) were included. Orthopedic patients with smaller wounds and fractures were excluded. Patient characteristics (gender, age, primary diagnosis, date, and length of

hospital stay, medical specialty, follow-up, and re-admittance within 30 days) were registered.

Results: 60% were admitted to the Medical Department, 22% to the Surgical Department, 15% to the Orthopedic Department and 3% to Department of Gynecology. 51% were women and 49% were men. Medical and Orthopedic patients were typically above 51 years of age while gynecological patients typically were between 21 and 40 years old. The surgical patients had an equal age distribution within the interval 21-90 years. No week-week variations of admittance (mean 25 patients a day) were seen. 59% of the patients were treated within 48 hours in the A&E department - out of these 59%, 25% were discharged immediately, 35% were sent to the clinical departments, the rest were sent to another hospital or died. Out of patients treated in the A&E department, 60% (Surgery), 39% (Medicine), 41% (Orthopedic), and 78% (Gynecology) were discharged without need of follow-up by General Practitioner (GP). 16% (Surgery), 10% (Medicine), 20% (Orthopedic Surgery), and 30% (Gynaecology) were seen in the outpatient clinics. 5.5% (Surgery), 1.9% (Medicine), 5.7% (Orthopedic Surgery), and 7.9 (Gynecology) were sent to the outpatients clinic of a different specialty. Totally, 4.3% were readmitted within 30 days once and 0.7% twice.

Conclusions: In this descriptive study we have provided data on patient characteristics and patient flow in our A&E department during a 4 month study period.

A38

Alcohol abuse patients lack follow up possibilities following ED discharge

Pernille Würtz Bøhm RN

The Emergency Department, Holbaek University Hospital, Holbaek, Denmark
E-mail: pwm@regionsjaelland.dk

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Alcohol is the major involvement for people seeking help at Emergency Departments (ED). In addition, it is demanding for the health professionals to talk with patients about alcohol abuse. The aim for this study was to examine current practices of treating alcohol abuse in the Quick Diagnostic Unit (QDU).

Methods: A qualitative semi-structured interview of nine hospitalized patients in a QDU. Patients were interviewed regarding social background, alcohol use, motivation to stop drinking, and the treatment in the QDU, their personal needs while hospitalized and upon discharge.

A questionnaire was sent to all ED nurses. The nurses were asked about their priority of the patients during their daily shift of 7.5 hours. The questions were divided into two groups, "non-alcohol abusers" and "alcohol abusers". The nurses were asked to rate nursing requirement.

Results: Patients were not hospitalized to get alcohol detoxification but because they were frightened for their health. The patients' drinking habits were beyond the Danish drinking average (Statistics Denmark, Consumption of alcohol and tobacco 2011, Published in News of Statistics Denmark), which is 11 units of alcohol per week. Average drinking for the patients at the QDU was 19 units per day (\pm 6.5). The reported alcohol use was 228 gram per day (\pm 36). Patients requested more information about their body's biochemical status. All patients knew they were not healthy, and they pointed out the information regarding their wellbeing as a central key for their alcohol habits.

Five patients had psychological diagnoses and three said they had psychological issues that had a bad influence on daily living.

Nurses spent one hour less on each shift on patients with alcohol abuse compared with non-alcohol abusers. 73% of the nurses experienced that patients with mental disorders did not get the sufficient treatment after discharge. 43% of the nurses did not think that the estimated time used on patients with alcohol abuse enhanced patients' health.

Conclusion: Alcohol abusers were hospitalized due to acute health problems. They needed more information while hospitalized. And they were heavy drinkers. The nurses spent less time with the group of patients with alcohol abuse and it did not improve their health. The primary sector should focus on the discharge offers.

A39

Should we marry a pharmacist? With or without separate property

Elisa Worthington, Mette Juul-Gregersen

Akut og Traumecenter, Ålborg Universitetshospital (AAUH), Aalborg, Denmark

E-mail: anew@rn.dk

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Background: In health care, there are increasing demands for efficiency and safe patient care. Concomitantly, requirements to patient-related documentation have risen among others for medication. Documentation is, however, time consuming and therefore not always done diligently, perhaps especially on weekends. One proven way to improve patient safety is the review of medication by a pharmacist after admission to the hospital to ensure correct medication (and documentation). Should we accept that pharmacists perform a medication review for us?

Material and methods: From May 1 to May 31, 2014, we did a non-randomized retrospective study of 259 consecutive surgical patients admitted to the Emergency & Trauma Center, AAUH. The focus was on medication review (MG), aligned the medication (MA), medication status (MS) and registration of medical allergies (CAVE registration) at admission and at discharge.

Results: At admission MG was made in 41.7% of the cases, MA of 40.5%, MS 75.7%, and in 17% of patients no medication review was performed. On discharge MG was made in 24.3% of the cases, MA 36.3%, MS 34.7%, and in 43.6% no review. In a total of 24 patients (9.3%), no review whatsoever of medicine was performed, neither in the ED nor throughout the in-hospital stay. Twelve cases (50%) occurred between Friday and Sunday. CAVE registration did not take place in 37 patients (14.3%). Of these 48.6% (18 cases), happened in the weekend.

Discussion: Paired medicine review, first by a doctor followed by a pharmaceutical can contribute to safer patient care. The pharmacist have the opportunity to do a systematic and critical medication review, without the same time constraints doctors have in a busy ED and ensure that the correct medication is documented. But is it fair that due to increased documentation requirements doctors have to get help?

Conclusion: Systematical pharmaceutical medication review will result in better documentation. But are we, as doctors, ready to hand over medication review to pharmacists? We do not renounce prescription rights but ensure better outcomes for our patients.

A40

Impact of clinical pharmacist intervention on acute admission unit length of stay

Katrine B Lind^{1,3*}, Charlotte A Sørensen², Suheil A Salamon¹, Marianne Lisby³

¹Department of Emergency Medicine, Randers Regional Hospital, Randers, Denmark; ²Hospital Pharmacy, Central Denmark Region, Denmark; ³Center of

Emergency Medicine Research, Aarhus University Hospital, Aarhus, Denmark

E-mail: katrine.brodersen@gmail.com

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Background: Quality and efficiency in the Emergency Department (ED) concerns clinicians and administrators worldwide because of an increasing number of patients and a desire for optimizing flow, avoiding crowding, and increasing the quality of the treatment.

For patients referred to an Acute Admission Unit (AAU), which is a sub unit in the ED, the physicians have to obtain a medication history and medication reconciliation that are time consuming. Medication histories obtained by physicians are often incomplete. The objective of the study was to investigate the impact of a clinical pharmacist (CP) intervention on the patients' AAU length of stay (AAU-LOS).

Methods: The study was a prospective cluster randomised study. Weekdays were randomised for control (standard care) or intervention (standard care plus CP intervention). CP intervention consisted of obtaining a medication history, entering prescriptions into the electronic medication module (EMM), medication reconciliation & review, and a written note in the electronic

medical record. The primary outcome measure was AAU-LOS defined as the interval between arrival and discharge or admission to hospital. Secondary outcome measures were physician time spent on medication topics, the number of medications per patient, and for the intervention group number of sources used for obtaining medication history and CP time spent.

Results: 230 and 218 patients were included in the control (n = 62 days) and intervention (n = 64 days) clusters. There were no differences in baseline characteristics between study groups. There was no difference in LOS between the control and intervention group. The un-adjusted LOS was in average 0.9% (95% CI [-7.4; 10%]) longer in the intervention group. The median self-reported physician time spent for medication topics was 7.52 minutes (control group) and 4.29 minutes (intervention group) resulting in an overall reduction of 43.0% (CI: (30.8; 53.0%), p < 0.001). Respectively, 10.1 and 8.8 medications per patient were documented in EMM in the intervention and control group. CPs used on average 12.3 minutes and 3.0 sources to conduct each medication history.

Conclusion: AAU-LOS was unaffected by CP intervention, although, physicians saved time on medication topics. CPs identified more medications than physicians.

Trial registration: Clinical Trial Gov: ID-number 1-16-02-379-13.

A41

Monitor alarms in the Emergency Department are frequent and unequally distributed during a day

Thomas Schmidt^{1*}, Camilla LN Bech², Marianne Glud², Uffe Kock Wiil¹, Annmarie Lassen²

¹The Mærsk Mc-Kinney Møller Institute, University of Southern Denmark, Odense M, Denmark; ²Department of Emergency Medicine, OUH Odense University Hospital, Odense C, Denmark
E-mail: schmidt@mmmi.sdu.dk

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Background: Audible alarms from monitoring equipment in the Emergency Department add to the overall noise level in the department, may cause alarm fatigue of clinicians, and in the worst case to an undetected deterioration in a hospitalized patient. Our aim with this study is to describe the use of electronic monitoring in the Emergency Department, the distribution of generated audible alarms, and to uncover temporal patterns in monitoring.

Methods: All adult patients admitted to the bed units of the Emergency Department at Odense University Hospital (November 15th 2013-August 1st 2014) with vital signs monitored as part of daily routine were included. Information from the monitors was stored in a research database. All registered vital signs were analyzed by hour of day in vital sign subgroups and compared with the generic alarm thresholds set in the Philips IntelliVue monitoring platform used at the department. We define an alarm event as three consecutive threshold violations.

Results: A total of 3,825 patients were registered across 4,395 admissions. A total of 7,132,460 vital sign measurements were registered in patient contacts based on heart rate (19.2%), respiratory rate (19.3%), peripheral capillary oxygen saturation (30.3%), pulse rate (30.3%), systolic blood pressure (0.9%), and diastolic blood pressure (1.1%). The mean number of measurements/hour was 1,156 (SD = 211, 95% 1,067-1,246). The accumulated average number of alarm events triggered/hour was 19.1 (SD = 3.2, 95% CI 17.8-20.5). A total of 39.5% of the measurements were registered during the night, 31.9% during the day shift, and 28.6% in the evening shifts. Night-hours accounted for 37.9% of the alarm-events, 33.8% of alarm-events happened during the day and 28.3% of the total alarm-events happened in the evening hours.

Conclusions: Although the monitor load increased during the night hours, the relative percentage of alarms generated went down. The alarm events generated by each vital sign type are distributed identically, but with different variation. Peripheral pulse rate and heart rate are the main contributors to daytime alarm events.

A42

Triage specific patient monitoring greatly impacts the number of alarming events in the Emergency Department

Camilla LN Bech^{1*}, Thomas Schmidt², Marianne Glud¹, Uffe K Wiil², Annmarie Lassen¹

¹Department of Emergency Medicine, OUH Odense University Hospital, Odense C, Denmark; ²The Mærsk Mc-Kinney Møller Institute, University of Southern Denmark, Odense M, Denmark
E-mail: Camilla.noergaard.bech@rsyd.dk

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Background: Electronic monitoring equipment usually have a predefined set of safe ranges and alarm thresholds that are manually altered depending on characteristics of patients and health care personnel. Preset alarm thresholds used to identify patients at risk of deterioration have poor specificity due to generalization of patient population, clinical needs, and care models. Staff at the Emergency Department is challenged by alarm fatigue which can ultimately be fatal; our aim with this study is to investigate the possible impact of triage specific thresholds on the number of generated alarms.

Methods: Adult patients admitted to the bed units of the Emergency Department (ED) at Odense University Hospital (October 1st 2013-August 1st 2014) with vital signs measured on electronic monitors. Registration of personal identification number, timestamps, and all measured vital values, linked to triage information from the electronic logistic tool in the Department and stored locally in a research database. Level of severity defined by triage category given upon arrival and observation regimes according to the ADAPT triage model. We define an alarm event as three consecutive threshold violations. Alarm events for each patient were analyzed with 1) preset alarm thresholds configured in the patient monitors, and 2) individual thresholds as proposed by the ADAPT triage model.

Results: 884 triaged patients and a total of 628,839 vital sign measurements were registered. The frequency of alarm events generated was higher when preset alarm thresholds were used. 70 alarms opposed to 22 in the resuscitation category. 1,433 opposed to 450 in the very urgent category and 4,032 to 4,261 in the less urgent category. In the two less urgent triage categories; "not urgent" and "fast track", the number of generated alarms were distributed opposite with most generated alarm events with individualized thresholds; 5,661/1,844 and 144/12, respectively.

Conclusion: The effect of individualized monitor alarm thresholds based on triage level has very different impact across groups. Given that patients are correctly triaged, the triage specific thresholds would have increased the total number of generated alarms by 35%. Primarily due to effect from patients triaged with the lowest levels of urgency.

A43

Patients treated by a medical trigger team at Sydvestjysk Sygehus Esbjerg

Mikkel Brabrand^{1,2,3*}, Lars Folkestad⁴, Jacob B Brodersen⁴

¹Emergency Department, Sydvestjysk Sygehus, Esbjerg, Denmark; ²Emergency Department, OUH Odense University Hospital, Odense, Denmark; ³Institute of Regional Health Research, University of Southern Denmark, Odense, Denmark; ⁴Department of Medicine, Sydvestjysk Sygehus, Esbjerg, Denmark
E-mail: mbrabrand@health.sdu.dk

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Background: Dedicated teams receive patients in cardiac arrest and trauma patients at Danish Emergency Departments (ED). Until recently, there was no dedicated team for medical patients. However, as medical patients can be equally complex and critically ill, we found a need for an increased capacity to receive these patients. In March 2012, we therefore initiated a medical trigger team (MTT) for the sickest medical patients. Our MTT consist of two experienced physicians, two nurses, a laboratory

technician and an orderly and the team is called when a patient meets certain criteria pre-hospitally. The team receives the patient in the ED and stays with the patient until stabilized or transferred to intensive care (ICU). The aim of this study was to present our initial findings.

Methods: We retrieved a log of all calls of the MTT from 15 March 2013 until 28 May 2013 at Sydvestjysk Sygehus, Esbjerg. We identified patients treated by the MTT and extracted relevant information from the patient charts. We excluded children, patients transferred immediately to tertiary care, and cases where we could not identify the patients reliably. In this abstract, we present data on the demographics of these patients as well as their disposition and prognosis.

Results: We had 103 activations of the MTT, two cases were unidentifiable, one was a child, one was cancelled and five patients were transferred immediately. We thus had 94 cases of which 46 (49%) were female and median age was 67 (range 15-96) years. Thirty-six (38%) patients presented with respiratory distress, 21 (22%) were unconscious, and 18 (19%) with convulsions. Median length of stay was 4 (range 0-23) days. Twenty patients (22%) were admitted directly to ICU and the rest to various medical departments. One patient (1%) died in the ED and one (1%) was immediately discharged. Seventeen (18%) died within one week, 24 (26%) within 30 days and 21 (22%) died in-hospital.

Conclusions: Patients treated by our MTT have a high mortality and a large proportion is admitted directly to the ICU. It thus seems that our team is alerted for the right patients, i.e. the most critical medical patients.

A44

Physicians using ultrasound in Danish emergency departments are mostly summoned specialists

Klaus Nielsen¹, Johnny RM Lauridsen², Christian B Laursen³, Mikkel Brabrand⁴

¹Department of Respiratory Medicine, Gentofte Hospital, Gentofte, Denmark;

²Department of Anaesthesia and Intensive Care, Holbæk Hospital, Holbæk,

Denmark; ³Department of Respiratory Medicine, OUH Odense University

Hospital, Odense, Denmark; ⁴Department of Emergency Medicine,

Sydvestjysk Sygehus, Esbjerg, Denmark

E-mail: klausnielsen.md@gmail.com

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Background: Emergency Ultrasound is a relatively new diagnostic discipline. It is used as an extension of the clinical examination and is ideal in the setting of acute illness. The objective of this study was to investigate how many Emergency Departments (ED) in Denmark have implemented emergency ultrasound. We also wanted to give an idea of how many and which physicians have adopted ultrasound as a diagnostic tool so far.

Methods: The study was a cross-sectional, descriptive, multicenter survey that included all physician staffed EDs in Denmark. An Internet based questionnaire was distributed by e-mail to all heads of department. Those departments who responded that ultrasound was available in their department were included in the second part of the study where all physicians working in the ED were contacted and asked to complete a second questionnaire.

Results: All 28 eligible Emergency Departments participated in the first part of the study (Response Rate (RR): 100%). 25 EDs (89%, 95% CI: 85-93) had ultrasound equipment available. Questionnaires were distributed to 1,872 physicians in these departments and 561 responded (RR: 30%, 95% CI: 28-32). Overall 257 (46%, 95% CI: 42-50) were users of Emergency Ultrasound and 304 were non-users (54%, 95% CI: 50-58). The largest group with 146 respondents (25%, 95% CI: 21-29) were anaesthetists with merely consult duty in the ED. When looking exclusively on physicians with on-call duty in the ED, thus excluding anaesthetists, only 146 (35%, 95% CI: 30-40) were users of ultrasound while 269 (65%, 95% CI: 60-70) were non-users. There was a considerable difference regarding age, level of training, and medical specialty between users and non-users. Users were mainly anaesthetists and attending physicians from other departments. The majority of non-users were young physicians with on-call duty in the ED.

Conclusion: We have found that although almost all Danish EDs have ultrasound equipment available, few ED physicians seem to have adopted

the tool. Emergency Ultrasound is mainly performed by specialists who are summoned to the ED in case of severe acute illness and not by those physicians who comprise the backbone of the ED around the clock.

A45

Nurses and the administration of Adrenaline in anaphylactic shock following the application of IV medicine

Rudolf Scheller¹, Stefan Posth²

¹Department of Geriatric Medicine, OUH Odense University Hospital, Odense,

Denmark; ²Department of Emergency Medicine, OUH Odense University

Hospital, Odense, Denmark

E-mail: rudolf.scheller@syd.dk

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"We recommend first-line treatment with intramuscular adrenaline before instituting other interventions as adrenaline is still underutilized in anaphylaxis although it is potentially lifesaving."

EAACI Guidelines Anaphylaxis 2014.

How is reality in a Danish university hospital?: At Odense University Hospital, nurses take part in a simulation training in critical patient care for younger doctors. One of the scenarios used is anaphylactic shock after the application of IV antibiotics. 49 out of 50 nurses realized within the first two minutes, that the simulation patient suffered from anaphylaxis. 48 out of 50 nurses stopped the IV with the antibiotic. Often, oxygen and IV NaCl was administered, and thereafter the doctor, who was five minutes away was called. Only two out of 50 nurses primarily injected adrenalin according to the hospital guideline.

Because of this, in 48 out of 50 cases adrenalin was given after more than five minutes. According to Pumphrey (2000), the median for a deadly anaphylactic reaction after the IV administration of medication is five minutes. Adrenalin is according to EAACI Guidelines 2014 and ERC Guidelines 2010 the primary treatment for anaphylactic shock and the only treatment that is lifesaving in such a situation.

Conclusion: It is necessary for all nurses to receive training in anaphylactic shock, including the primary injection of adrenalin in order to secure immediate treatment in this critical condition.

This training could be linked to resuscitation training.

A46

Medical students can easily acquire intraosseous cannulation skills

Ask D Kvisselgaard¹, Monika Afzali¹, Tobias S Lyngeraa², Sandra R Viggers¹

¹Students' Society for Anaesthesiology and Traumatology, Faculty of Health

Sciences, Copenhagen University, Copenhagen, Denmark; ²Department of

Anaesthesiology, Bispebjerg Hospital, Copenhagen, Denmark

E-mail: akvisselgaard@me.com

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Background: In life-threatening emergencies with intravascular volume depletion, shock, or even cardiac arrest, obtaining conventional intravascular access can be difficult due to peripheral vascular shutdown. Intraosseous (IO) access is recommended during resuscitation when conventional intravenous access is difficult and is a fast and safe method for administration of fluids, blood products, and medications. However, lack of training in the procedure may be a reason why the use of the IO access is still limited in resuscitation. The goal of this study was to investigate if medical students can obtain competencies in IO access taught on a human cadaver course.

Methods: A total of 19 medical students (4th-12th semester) from the University of Copenhagen, all members of the Students' Society of Anaesthesiology and Traumatology, participated in the course. A modified Peyton's four-step approach was used for the hands-on training preceded by a short theoretical lesson. Following the course, three observers evaluated performance during a procedure-specific objective structured clinical examination (OSCE). The OSCE checklist was developed by the authors from existing guidelines and previous literature. Inter-observer

agreement with Randolph's free-marginal multirater κ was compared to evaluate validity of the checklist.

Results: In the final OSCE, 15 students participated. A total of 11 students (73%) obtained the highest attainable points; 15. The median total score was 15 (12-15). There was no correlation between the failed items on the checklist for the four students who did not receive maximal points.

The free-marginal κ value was calculated to 0.7066 indicating substantial agreement between the observers.

Conclusion: This study has demonstrated that the fundamentals of safe IO access can be taught to medical students through a human cadaver course. Further studies are needed to validate the retention of the gained knowledge and different teaching modalities should be tested against each other. We suggest that the training in IO access could be a part of the curriculum in medical school to ensure the highest standard of care in resuscitation.

A47

Why discrepancy between patient satisfaction and documentation of pain management?

Marianne K Barylak*, Christina Ø Rasmussen, Helle Ipsen
Emergency Department, Nykøbing Falster Hospital, Nykøbing Falster,
Denmark

E-mail: mkb@regionsjaelland.dk

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Introduction and purpose: Pain is one of the main causes leading to admission in the Emergency Department (ED) and has importance for patient satisfaction. Baseline LUP data of patient satisfaction has demonstrated that although patients are content, audit of the health care documentation of pain treatment seems insufficiently. Therefore, this study will investigate the difference between patient satisfaction, staff experience, and results from audit of the documentation of pain management in patient files. The hypothesis is that the documentation only describes a minor part of the efforts to treat the patient's pain.

Materials and methodology: A qualitative investigation using a validated semi structured questionnaire of ED nurses' experience and attitude to pain management and documentation will be compared with documented care and treatment in patient files. Results will be analysed with qualitative analysis and presented as display. Baseline audit of documentation of pain treatment in 77 files and questionnaire with 5 staff nurses as indicator, followed by questionnaire of 20 nurses working 2 consecutive days.

Results: The national LUP performed in 2011-2013 shows patient satisfaction of pain management 82-85%. Baseline audit shows that 85% of all patients in the ED have been asked about pain at arrival. 30% has got VAS/NRS score > 3, which demand a documented plan and follow up of the effectiveness of treatment (regional guideline) although audit shows it was only documented in less than 15% of the files. The questionnaire with 20 nurses identify that nurses have a holistic approach to pain treatment but the time factor and lack of system support is the main course of this weak documentation.

Conclusion: The study has shown that nurses work with pain management in a way that might have importance for the patient satisfaction but it is not demonstrated in their documentation. Further studies will be performed involving the patients' ideas to identify and develop a pain management report.

A48

The teaching of pediatric emergency procedures to medical students - a pilot study

Camilla B Sørensen*, Sandra R Viggers
Students' Society for Anaesthesiology and Traumatology, Faculty of Health
Sciences, Copenhagen University, Copenhagen, Denmark

E-mail: Camilla.birgitte.sorensen@gmail.com

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Background: Junior doctors are often first on scene in the emergency department. It is therefore crucial that they are capable of performing

life-saving interventions (LSI's). Pediatricians and anesthesiologists handle pediatric emergencies. However, depending on hospital location, local structure, and resources junior doctors can be compelled to perform these LSI's. Many junior doctors will not learn additional pediatric skills after the end of the assigned curriculum in medical school. We designed a four-hour workshop-based course to introduce Danish medical students to clinical skills needed to manage pediatric emergencies.

Methods: A total of 12 medical students all in their fourth-sixth year of medical school participated in a four-hour course in pediatric procedures. Students were divided into groups of four. The course included workshops with theory and practical training in intraosseous access (IO), foreign body airway obstruction (FBAO), neonatal resuscitation (NR), and umbilical vein catheterization (UVC). Prior to the workshops the students were presented with a multiple-choice questionnaire (MCQ). The MCQ was repeated at the end of the course. At the end of the training sessions an objective structured clinical examination (OSCE) was performed and the students were assessed using a graded (0-3 points) standardized checklist. Data from the MCQ tests were analyzed using the Wilcoxon Signed Rank test and a p-value < 0.01 was considered significant.

Results: A total of 12 medical students performed the pre and post MCQ test and the OSCE. The MCQ test shows a significant improvement in the post-test ($W = 78$ $Z = 3.04$, $p < 0.005$). For UVC the mean score in the OSCE was 7.67 (3-9). The maximum obtainable score for the whole group was 108 points. The participants scored a total of 85% (92/108). For FBAO, mean = 9.25 (6-10) and total OSCE score = 93% (111/120). For NR, mean = 9.17 (6-11) and total OSCE score = 83% (110/132). For I.O, mean = 8.42 (7-9) and total OSCE score = 93% (100/108).

Conclusion: This small pilot study indicates that students can learn to perform pediatric LSIs, at least in an educational environment. The students performed well in the MCQ but OSCE identified some gaps in performance. Future research in students' ability to translate theoretical knowledge into practical skills is necessary.

A49

Diagnostic tracks in emergency departments match discharge diagnoses fairly well

Birgitte Nørgaard^{1*}, Christian B Mogensen^{2,3}, Lars S Teglbjærg⁴,
Mikkel Brabrand⁵, Annmarie T Lassen⁶

¹Institute of Public Health, University of Southern Denmark, Odense, Denmark; ²Emergency Department, Aabenraa Hospital, Hospital of Southern Jutland, Aabenraa, Denmark; ³Institute of Regional Health Research, University of Southern Denmark, Odense, Denmark; ⁴Emergency Department, OUH Odense University Hospital, Svendborg, Denmark; ⁵Emergency Department, Hospital of South West Jutland, Esbjerg, Denmark; ⁶Emergency Department, OUH Odense University Hospital, Odense, Denmark
E-mail: binorgaard@sdu.dk

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Background: Patients arrive in the emergency departments with symptoms and problems rather than with diagnoses. Since 2008, the categorisation and subsequent treatment of patients in emergency departments in the Region of Southern Denmark (RSD) have been based on presenting symptoms. Quality and effectiveness is assumed to improve with acceptable diagnostic track assignment.

Our aim was to determine the degree to which assigned diagnostic tracks matched clinically relevant discharge diagnoses.

Methods: A descriptive cohort study of all patients assigned to a diagnostic track in the five emergency departments between April 1st and June 30th 2013 was conducted. Data were linked to data reported to the Danish National Patient Register. Using Delphi method we developed a quality standard to indicate assignment to an acceptable diagnostic track (linkages between diagnostic tracks and discharge diagnosis).

Results: Of the identified 17,694 patient contacts leading to assignment to a diagnostic track, 16,543 were validated as unique patient pathways. Patients' mean age was 59.8 years; mean length of stay was 3.2 days. The number of different discharge diagnoses used by emergency departments was 1,792; the corresponding number for hospital discharge was 2,030. All 40 diagnostic tracks offered by the region were represented. Sixty-eight per cent had been assigned an acceptable diagnostic track (CI 67.2-68.7).

For 30 diagnostic tracks, we found appropriate use of tracks in more than 50% of cases. With stays between 2 and 5 days, significantly more patients were assigned an acceptable diagnostic track compared to shorter or longer stays ($p < 0.001$). Younger patients were more likely to be offered an acceptable track ($p < 0.001$). No significant association was established between comorbidity and assignment to an acceptable diagnostic track. Fourteen diagnostic tracks covered 80% of the included pathways.

Conclusions: We found that 68% of the included patients were assigned an acceptable diagnostic track, and that about 80% of all acute pathways were covered by 14 diagnostic tracks. The studied emergency departments showed no significant differences with respect to their success in assigning patients to acceptable pathways. We suggest further modification and refinement of the concept of diagnostic tracks, followed by testing.

A50

How many years does it take to establish a specialty in emergency medicine?

Peter Hallas¹, Lars Folkestad^{2*}, Dan B Pedersen³, Mikkel Brabrand^{4,5}

¹Department of pediatric anesthesia 4013, Rigshospitalet, Copenhagen, Denmark; ²Endokrinologisk afdeling M, OUH Odense Universitetshospital, Odense, Denmark; ³Dansk Selskab For Akut Medicin (DASEM), Aarhus, Denmark; ⁴Fælles Akutmodtagelse FAM, OUH Odense Universitetshospital, Odense, Denmark; ⁵Fælles Akutmodtagelse FAM, Sydvestjysk Sygehus, Esbjerg, Denmark

E-mail: larsfolkestad@surfmail.dk

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Background: Establishing a specialty in Emergency Medicine (EM) is an important step in improving emergency care. The aim of the present study is to identify how long it takes to establish an EM specialty in a European country.

Methods: An online questionnaire was sent to the national EM societies listed as members of the European Society for Emergency Medicine (EuSEM) and Iceland. The EM societies were contacted via public contact email-addresses and via the EuSEM office. Data from 31 countries were sought. The questionnaire housed three questions: 1) "What year was your national society in Emergency Medicine founded?" 2) "What year was EM recognized as a supra- or subspecialty?" 3) "What year was EM recognized as a specialty (in its own right)?" Fisher's exact test and t-test was used for analyses.

Results: We received 17 answers (response rate of 61%). The majority (65%, $n = 11$) had an established specialty in EM. The overall time from the Foundation of a national society until a specialty was recognized was six years. In 52% ($n = 9$) of the countries, EM was or had been a supraspecialty or equivalent. Having a supraspecialty (or equivalent) in EM did not affect the likelihood of having a specialty later on ($p = 1.00$). The age of the national EM society did not differ between countries with and those without a specialty (13 versus 9 years; $p > 0.05$). For countries with a *supraspecialty or equivalent*, it took 7 years to have an EM specialty in its own right, from the foundation of an EM society. For countries *without a supraspecialty or equivalent*, it took 4.4 years, from the foundation of an EM society to have a specialty in EM recognized. Establishing a *supraspecialty or equivalent* increased the time to an EM specialty in its own right significantly ($p > 0.05$).

Conclusions: In the European countries, it takes about 6 years on average from forming of a national society for emergency medicine to the formal recognition of a specialty albeit with large variations. Starting out with a supraspecialty in EM (or equivalent) may not increase the likelihood of an EM specialty.

A51

Medical trigger teams for severely ill medical patients in the Emergency Department

Stefan Posth¹, Mette Worsøe, Anmarie T Lassen

Department of Emergency Medicine, OUH Odense University Hospital, Odense, Denmark

E-mail: stefan.posth@rsyd.dk

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Background: Medical patients who arrive severely ill at the Emergency Department (ED) need to be diagnosed and treated immediately, as prognosis decreases rapidly with time spent before correct treatment is given for most of these patients.

At Odense University Hospital, patients arriving at the ED with either a pulse rate >140 , systolic blood pressure <80 mmHg, Glasgow Coma Scale <9 , respiratory frequency >35 or <8 or a saturation $<80\%$ are met by the medical trigger team. Patients with suspected apoplexy, STEMI or orthopedic multitrauma are met by other specialized teams.

Objectives: To describe frequency, patient characteristics, and 7 day mortality for adult patients (>18 years) managed by medical trigger teams, thrombolysis, and orthopedic trauma teams.

Methodology: All patients who were met by a medical trigger team, a thrombolysis, or an orthopedic trauma team at arrival to the ED, Odense University Hospital between April 1st 2012 and May 31st 2013 were included.

Results: A total of 884 patients were met by the medical trigger team, 306 by the thrombolysis and 377 by the orthopedic multitrauma team. The median (range) number of team activations per day was 2 (0-9), 0(0-6), and 1 (0-6). Median age (25-75%) was 70 (56-80), 67 (54-76), and 42 years (26-59), 54% (95% CI 50%-57%), 53% (95% CI 48-59%), and 73% (95% CI 68-78%) were male, 7 day mortality was 18% (95% CI 16-21%), 9% (95% CI 6-13%) and 7% (95% CI 5-11%).

Conclusion: Medical trigger teams were used median twice a day. Their patients have a higher mortality than patients met by the thrombolysis or orthopedic multitrauma teams.

A52

The organization of Danish emergency departments may not have allowed for a full realization of their performance potential

Anders Møllekaer^{1,2*}, Iben Duvald², Børge Obel², Jacob Eskildsen², Hans Kirkegaard¹

¹Center for Emergency Medicine, Department of Clinical Medicine, Aarhus University & Aarhus University Hospital, Aarhus, Denmark; ²Interdisciplinary Center for Organizational Architecture (ICOA), Department of Social and Business Science, Aarhus University, Aarhus, Denmark

E-mail: Anders.Moellekaer@ki.au.dk

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Background: According to The Danish Medical Association the 21 Danish emergency departments (EDs) have different organizational designs. Research shows that a 30% performance loss (i.e. quality of care and efficiency loss) can be attributed to organizational design. The aim of this study is to investigate the organizational design of Danish EDs and point to where the full potential of the EDs may not have been reached.

Method: The study uses a qualitative design. Eight hospitals participated in the study. At each hospital five-six recorded semi-structured interviews were conducted with hospital management, ED leaders, physicians, nurses, and secretaries. Data on the ED's organizational design were collected and analyzed using the multidimensional contingency model. The model describes the relationship between the building blocks that constitutes any organization: Organizational scope, strategy, environment, configuration and complexity, knowledge exchange, process and people and coordination, and control. Alignment between the building blocks is the ideal state (fit). Misalignment (misfit) is a state that is likely to cause decreased performance. The interviews took place from October to November 2013 and from May to August 2014.

Results: Two main designs were identified: A functional design and a process-orientated design. Both shared the same goal, strategy, and environment. The functional design was organized around the medical and surgical specialties. It had misfits caused by a predominantly functional configuration, ad hoc based communication, limited incentives to do work in the ED, and difficult coordination and control of work processes. The process-orientated design was organized around the patient care process. It had misfits related to staff competencies (people) and coordination and control. In addition, four EDs had a process-orientated design during daytime and a functional design during evening/night time, thus greatly increasing the number of misfits.

Conclusion: ED organization is very complex. Four out of eight EDs had two organizational designs. There seem to be unrealized potential to

improve performance further. Research is needed to expand the study to include the remaining EDs and the relationship between the organizational design and performance.

A53

Can Google Glass facilitate work for nurses in the emergency department?

Thomas Schmidt^{1*}, Charlotte Mose Hansen², Jan Dahlin²

¹The Mærsk Mc-Kinney Møller Institute, University of Southern Denmark, Odense M, Denmark; ²Emergency Department, OUH Odense University Hospital, Odense C, Denmark

E-mail: schmidt@mmmi.sdu.dk

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Background: One of many challenges for Emergency Departments is having access to clinical guidance when and where it is needed. In this abstract we provide a first experience from a pilot study involving the use of Google Glass in the Emergency Department among nurses. The involved nurses were asked to evaluate the experience of using Google Glass as a communication device instead of traditional mobile phones.

Methods: Each participant responded to a two-part survey with two descriptive and four Likert scaled questions. Responses were analyzed in Excel through descriptive analysis of the survey responses. The descriptive section asked for clinical role, number of usage attempts, and number of patients attended to. The Likert questions were: 1) Experience of call quality, 2) Experience of sound quality, 3) Total usage experience, and 4) Patient interaction experience. Each of these questions were scaled in five steps from poor, below average, average, above average, good, and grouped into below, average, and above in the analysis.

Results: 11 of 12 involved nurses responded to the survey, with a role distribution of 1 triage shift, 4 receiving ward shifts, 2 coordinating nurse shifts, 3 shifts treating fast track injuries, and one who covered several of these roles. The average nurse attended to 9.9 patients, and on average attempted to use the equipment 5.5 times during each shift. 55% experienced call quality as below average, 36% as average, and 9% as above average. 73% experienced sound quality as below average, 18% as average, and 9% above average. 64% marked total usage experience as below average, 27% as average, and 9% above average. 64% said patient interaction experience was below average, 27% as average, and 9% above average.

Conclusion: The main obstacle of using Google Glass was issues with the quality of sound. Usability measures such as total usage and patient interaction experience may have scored higher had experience with sound quality been better. Thus, given the ubiquitous and individual nature of wearable technology, further studies should be made.

A54

Pain assessment in emergency department as part of triage system has limited interobserver agreement

Martin Hangaard, Brian Malling, Christian B Mogensen*

Department of Emergency Medicine, Hospital of Southern Jutland, Aabenraa, Denmark

E-mail: christian.backer.mogensen@rsyd.dk

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Background: In the Danish Emergency Process Triage (DEPT) pain is used as an independent contributor for triaging patients and is validated by the Numerical Pain Rating scale, NRS-11. Prior studies have assessed the congruence between nurse's assessment of their patients' pain intensity and the patients' own pain perception with mixed results. The aim of this study was to examine the correlation in pain score between nurse and patient and the inter-rater agreement between nurses when the pain score is used in a triage system in an Emergency Department.

Method: The patients were asked to score themselves on the NRS scale and a final NRS score was then given by the nurses based on their objective findings. We asked two nurses to independently validate the same patients according to the DEPT triage instructions. The two nurses did not have

access to each other's pain score of the patient. Data were analysed by Wilcoxon signed rank test and Kappa statistics.

Results: A total of 326 independent patient-nurse pairs of observations were analysed. The nurses scored the patient significantly lower on the NRS scale than the patients did themselves (NRS median 3 versus 5, $p < 0.0001$). The overall inter-rater agreement between nurses and patient was moderate (Kappa 0.46; 95% CI 0.46-0.50) but lower for younger patients and patients with an orthopaedic pain complaint. In 163 patients, pain score was assessed by two nurses and the inter-rater agreement moderate (Kappa 0.54; 95% CI 0.49-0.61), lower for younger patients and female patients.

Conclusion: Nurses score patient pain lower than the patients on the NRS scale, especially young and orthopaedic patients. The inter-rater agreement between the nurses was also moderate and lower for young and female patients. These findings weaken the usage of pain in triage systems.

A55

Routine biomarkers are strong predictors of short term mortality

Michael Kristensen^{1*}, Charlotte Barfod², Jacob Forberg³, György Söletormos⁴, Morten Schou⁵, Kasper Iversen⁵

¹Department of Cardiology, Nephrology and Endocrinology, Hillerød University Hospital, Hillerød, Denmark; ²Department of Anaesthesia, Head and Neck Surgery Centre, University Hospital Rigshospitalet, Copenhagen, Denmark; ³Department of Emergency Medicine, Hillerød University Hospital, Hillerød, Denmark; ⁴Department of Clinical Biochemistry, Hillerød University Hospital, Hillerød, Denmark; ⁵Department of Cardiology, Hillerød University Hospital & Herlev University Hospital, Hillerød, Denmark

E-mail: Kristensen.michael@gmail.com

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Background: Today most patients have a routine biochemical screening taken on arrival to the emergency department. However, the results are not used in the initial assessment of the patients. Including the routine biochemical screening in a triage model may add important predictive value to the initially performed risk stratification.

Methods: A prospective observational cohort study of 6,279 consecutive patients admitted from the Emergency Department of Hillerød University Hospital. All triaged patients with a full biochemical screening (albumin, creatinine, CRP, haemoglobin, Lactate dehydrogenase, leukocytes, potassium, and sodium) were included. Vital status was collected from the Danish Central Office of Civil Registration. The primary endpoint was 30-day mortality. Secondary endpoints were admission to intensive care unit (ICU) and readmission. Univariate logistic regression splines were made for all eight biomarkers with cuts defined after internationally accepted reference intervals. These models were used to create a multivariate logistic regression spline including all eight biomarkers, and discriminative ability was evaluated with receiver operation characteristics and area under the curve (AUC). Ultimately predicted risks of mortality based on the biomarkers were calculated for all patients, and they were divided into four groups: Green <1%, yellow 1-10%, orange 10-25%, red >25%.

Results: 5,371 patients were included (85.5%). Average age was 60.9 years [60.6; 61.1] with 48.0% [46.7; 49.3%] males. Overall mortality was 5.3% [4.7; 5.9%]. Mortality in the least acute category was 2.8% [2.0; 3.6%] for the original triage and significantly lower for the biomarker model, 0.3% [0.1; 0.5%] ($p < 0.01$). Mortality in the most acute triage group was 22.6% [16.1; 29.1%] and significantly higher for the biomarker model, 43.3% [37.1; 49.5%] ($p < 0.01$). Triage was a weak predictor of short-term mortality and demographics (age and sex) alone proved significantly stronger (AUC = 63.82% vs. 75.22%, $p < 0.001$). Routine biomarkers were strong predictors (AUC = 86.41%) and could improve the original triage significantly (Δ AUC = 23.66%, $p < 0.001$).

Biomarkers were weak predictors of admission to Intensive Care Units compared to the triage (AUC = 68.66% vs. 73.15%), however added to the triage, discrimination was improved significantly (Δ AUC = 4.75%, $p < 0.001$). None of the models proved able to predict re-admissions.

Conclusion: Adding biomarkers to the presently used triage model can add significant discriminative value and improve early risk stratification of patients in the emergency department.

A56

When and why are the elderly medical patients admitted and readmitted?

Donna L Wolff¹*, Christian B Mogensen²

¹Medical Center, Hospital of Southern Denmark, Aabenraa, Denmark;

²Emergency Center, Hospital of Southern Denmark, Aabenraa, Denmark

E-mail: Donna.wolff@rsyd.dk

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Background: Acute hospitalizations of elderly people are increasing, resource-demanding, and potentially harmful. There is an ongoing interest in alternatives to admissions and in reducing the length-of-stay. Before suggesting alternatives more knowledge is requested, especially concerning admission patterns and whether short stay is associated with increased risk of re-admission. The aim was to describe the acute medical (re)admission patterns in patients more than 65 years old.

Methods: A retrospective cohort study included all 65+ years acute medical admissions between April 2012 - February 2014 in 3 hospitals of Southern Jutland. Data about patient and hospital characteristics was analyzed using logistic regression. Primary admission was defined as no previous admission within the last 30 days and readmission as less than 30 days since last admission.

Results: Preliminary results showed that among 65+ years 15,714 acute medical admissions accounted for 37% of all acute adult hospital

admissions. The median age was 78 years (q25-q75: 71-84 years) equally gender distributed. The admission rate was significantly higher in January and July (9%) and lower in April (7%) than the average months ($p < 0.0001$). Monday and Friday had the highest and Saturday and Sunday the lowest admission (16% vs 11%, $p < 0.0001$). 81% were admitted between 8 am. and 21 pm. Median length-of-stay was 2.7 days (q25-q75: 0.9 - 6.3 days). 44% were discharged within 48 hours and only 22% stayed for more than 1 week. 19% of the admissions were readmissions, 16% after a primary admission. There was a significant lower readmission rate after short versus long (< 48 hours) primary admissions (13% vs. 18% $p < 0.0001$). Increased risk for readmission was also related to gender and month of admission, but not to the patient's municipal, triage, age, diagnosis, hospital, department shifts, weekday, or time of primary admission.

Conclusions: Medical acute admissions among elderly account for more than 1/3 of all acute admissions among adults and occur mainly during daytime. 19% are readmissions, and the risk of readmission were not associated to short in-hospital stay, age, municipal, or discharge diagnosis but to month of admission and gender.

Cite abstracts in this supplement using the relevant abstract number, e.g.: Wolff and Mogensen: When and why are the elderly medical patients admitted and readmitted?. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 2015, 23(Suppl 1):A56