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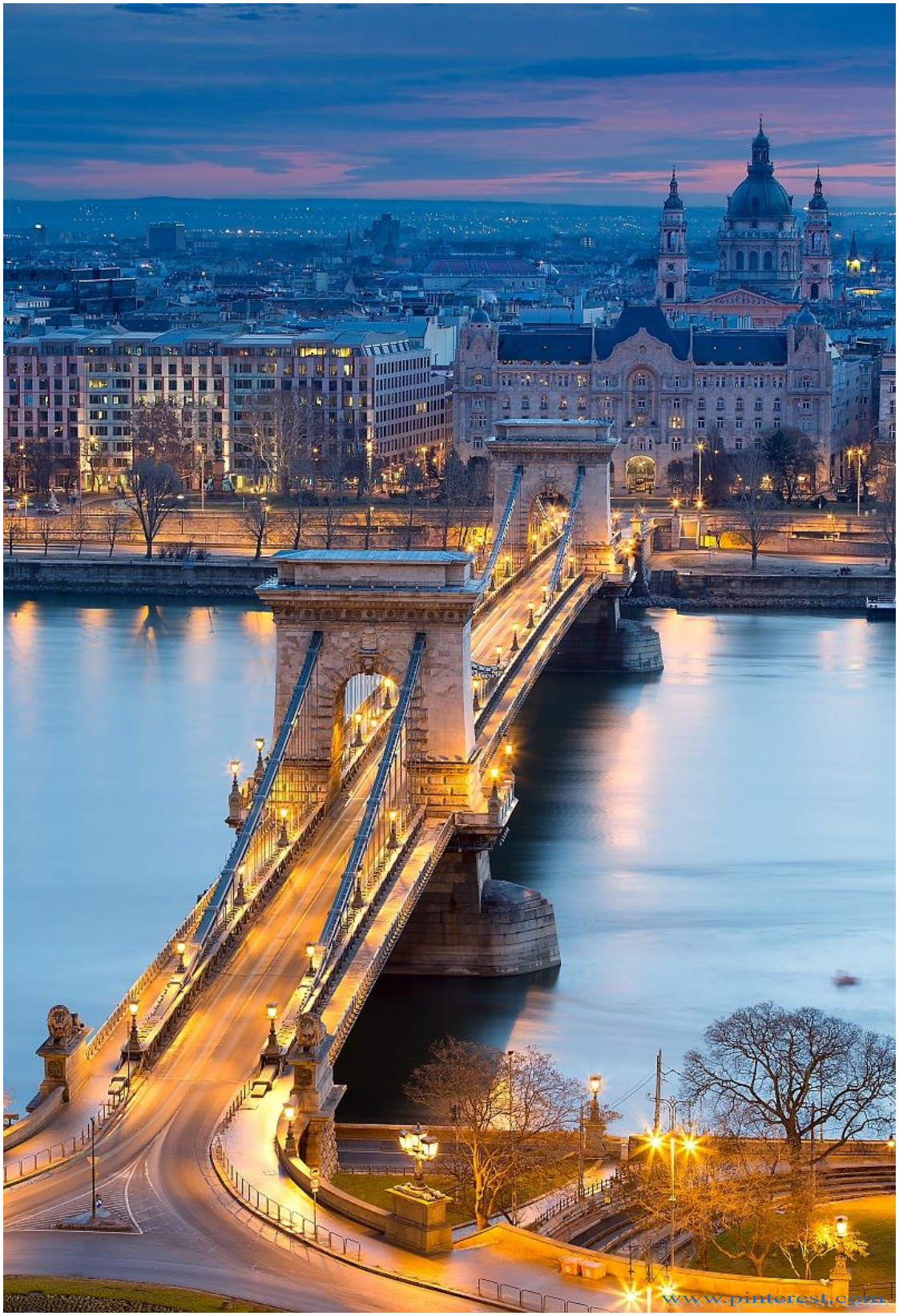

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ABSTRACT BOOK

SPECIFICITIES IN EMERGENCY PATIENT CARE IN HELICOPTER EMERGENCY MEDICAL SERVICE

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Introduction: Implementing of the helicopter emergency medical service (HEMS) in the Republic of Croatia is providing better health care and faster health care in emergency setting. Previous research has shown that HEMS enables faster, better quality and more adequate care in emergency situations.
Methods: In this abstract we have analyzed an overview of the specific scientific literature about the importance of HEMS. Avaliable papers are based on the analysis of data from national registers, avaliable literature and according to the expert opinion (teams working in HEMS).
Results: Previous research has shown that the use of HEMS in emergency patients significantly contributes the quality of treatment and faster treatment (arrival time). Analyzed data from traumatic and non-traumatic databases showed that treatment of non-traumatic patients is significantly faster and enables reduced arrival time in the hospital and therefore treatment is more adequate. Data analysis of traumatic cases shows that arrival time is same or little faster but the most important point is that patients are treated in adequate trauma centers that follows guidelines of tratment of polytraumatized patients. Also, the use of HEMS significantly reduces rehabilitation resulting in faster patient recovery and better quality of life.
Conclusion: The HEMS contributes better emergency care quality, reduced arrival time and decreased transportation time. HEMS also contributes to rehabilitation and quality of life after discharge from hospital.
Key words: emergency medicine, helicopter emergency medical service, emergency care treatment

MICROCIRCULATION IN SEPSIS

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Sepsis is a life-threatening condition characterized by systemic inflammation and multiple organ dysfunction, often driven by profound microcirculatory disturbances. The microcirculation, composed of arterioles, capillaries, and venules, plays a crucial role in oxygen delivery and tissue perfusion. In sepsis, endothelial dysfunction, increased capillary permeability, leukocyte adhesion, and impaired autoregulation lead to heterogeneous blood flow and tissue hypoxia, contributing to organ failure. Despite adequate macrocirculatory resuscitation, persistent microcirculatory dysfunction is associated with poor prognosis. Novel diagnostic techniques, such as videomicroscopy, have improved our understanding of these alterations, while emerging therapies targeting endothelial protection, glycocalyx preservation, and mitochondrial function show promise in restoring microvascular homeostasis. This review highlights the pathophysiology of microcirculatory failure in sepsis and its potential therapeutic implications.

AI IN EARLY SEPSIS PREDICTION

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Sepsis is a life-threatening condition that requires early detection and intervention to improve patient outcomes. Artificial Intelligence (AI) has emerged as a powerful tool in healthcare, leveraging machine learning and deep learning techniques to predict sepsis at its early stages. AI models analyze vast amounts of patient data, including vital signs, laboratory results, and electronic health records, to identify subtle patterns indicative of sepsis before clinical symptoms become critical. These predictive models enhance clinical decision-making, reduce mortality rates, and optimize resource allocation. Despite challenges such as data quality, model interpretability, and integration into clinical workflows, AI-driven sepsis prediction holds significant promise for transforming critical care and improving patient survival rates.

MANAGEMENT OF PATIENTS WITH CARDIOGENIC SHOCK IN THE EMERGENCY DEPARTMENT

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Cardiogenic shock (CS) is a clinical syndrome caused by cardiac dysfunction and decreased cardiac output, leading to tissue hypoperfusion. In approximately 70% of cases, the

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underlying cause is acute damage to the heart, such as an acute myocardial infarction. One of the key hemodynamic criteria for diagnosing CS is hypotension, defined as a systolic blood pressure of less than 90 mmHg; however, more than 5% of patients with CS may present without pronounced hypotension, possibly due to the release of catecholamines. One of the major challenges in managing CS patients in the emergency department (ED) is the early recognition of the syndrome, given its varied clinical presentations and its overlap with other types of shock. In the fast-paced environment of an ED, it is crucial to remember that the diagnosis of CS is primarily clinical and does not necessarily rely on additional hemodynamic indicators (cardiac index< 2.2 L/min/m2, pulmonary capillary wedge pressure ≥ 15 mm Hg). Patients often report symptoms such as dyspnoea, fatigue, chest pain, and ankle swelling. Upon clinical examination, signs of congestion may be observed, including distension of jugular veins, lung crackles, and peripheral edema.In addition to patient history, a thorough clinical examination, laboratory findings and ECG, point-of-care ultrasound through the RUSH exam plays a crucial role in identifying CS. Initial management includes urgent hemodynamic stabilization, determining the underlying cause, and administering appropriate treatment. The primary goal of the initial stabilization is to maintain MAP greater than 65 mmHg. Depending on the patient's volume status, diuretics or fluid challenge may be necessary, and the use of vasopressors and inotropes (such as norepinephrine and dobutamine) should be considered for treating hypotension and hypoperfusion. The mortality rate among CS patients is alarmingly high (25-70%). However, early recognition and appropriate treatment in the ED are associated with better outcomes.

OPTIMIZATION OF THE WORKLOAD AND WORK PATTERN IN A TERTIARY EMERGENCY CENTRE BY MEANS OF LOGISTIC ENGINEERING

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Emergency department overcrowding is a daily problem in acute care. Improving input, throughput and output might alleviate this but new challenges emerge with time. With a co-operation between two institutions, the University of Pécs and the Budapest University of Technology and Economics an analysis of workflow, human resurcing, patient information was initiated with specific data analysis. Questions were asked on how the throughput can be improved by deep analysis of the available parameters and initial results suggest that real-time information on daily, weekly patterns, data acquisition of time stamps on patient arrival, discharge, request of laboratory and imaging tests, specialist consults, the return of the results is helpful in planning rota and optimizing workload in the Emeregency Department.

AN INDIVIDUALIZED TREATMENT OPTION FOR THROMBOLYSIS OF PULMONARY EMBOLISM: CLOTPRO GUIDANCE AND ECHOCARDIOGRAPHY CONTROL

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Background. The 2019 ESC guideline (Guideline) regarding the treatment of pulmonary embolism suggests performing thrombolysis only in high-risk cases after risk stratification, considering the bleeding risk of the intervention. The recommended dose for thrombolysis, using the most commonly applied tPA, is 100 mg over 2 hours. However, in emergency situations, an administration of 0.6 mg/kg body weight in 15 minutes is also acceptable (up to a maximum total dose of 50 mg), according to the recommendation (1). Based on literature data, the risk of severe bleeding is as high as 13.8%, and the risk of intracranial haemorrhage is 3.6% (2). In cases of intermediate-high risk, monitoring is recommended, and thrombolysis should be considered if the patient's condition worsens. At the same time, the FOCUS study in 2022 highlighted that chronic pulmonary hypertension and post-pulmonary embolism impairment primarily affect patients in the intermediate-risk category, who presumably did not receive thrombolysis therapy (3). AimBased on observations made by our research group during the COVID-19 pandemic, a study was initiated in 2021 to reduce the bleeding risk while achieving effective thrombolysis. The study used ClotPro-guided, echocardiography-controlled thrombolysis under an ethics license (65187-5/2021/EÜIG; clinical trial registration: NCT06667882).

Methods. The study included patients aged 18 years or older who were diagnosed with pulmonary embolism between December 2021 and September 2023 who fell into the high or intermediate-high early mortality risk category as defined by the Guideline and who provided informed consent. Patients who did not provide informed consent, those with absolute contraindications to thrombolysis, and pregnant patients were excluded. In the ClotPro-guided (CPG) group, we monitored coagulation hourly with viscoelastic tests before and during thrombolysis. If the ECA test, which is most sensitive to thrombolysis, did not show adequate lysis, the tPA dose was increased, and it was decreased if a significant reduction in the MCF value of the FIB test was observed. If necessary, fibrinogen was administered. Echocardiography, performed every two hours, was used to assess signs of right ventricular strain, and thrombolysis was stopped once these signs were resolved. Viscoelastic tests were also performed in the control (C) group, but their results did not influence the decision to perform thrombolysis.

Results. Out of the 33 patients diagnosed with pulmonary embolism, 11 were excluded (1 patient with head injury, 2 patients with active bleeding, 2 patients due to lack of consent, and 6 patients due to lower early mortality risk). During the final evaluation of the results, one patient in the C group was excluded due to interrupted thrombolysis following 50 mg

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tPA because of severe chest pain, and one patient in the CPG group was excluded later when examinations revealed arterial occlusion due to angiosarcoma. Thus, data from 22 randomized patients were analyzed: 7 patients in the C group (female/male: 3/4; mean age: 66.00+/-9.02 years) and 13 patients in the CPG group (female/male: 4/9; mean age: 55.76+/-13.34 years).In the CPG group, the duration of treatment varied depending on the echocardiographic results (mean duration: 8.38 +/- 1.63 hours). The rate of tPA administration, and consequently the total dose (mean total dose: 33.00+/-12.45 mg), was determined by the hourly ClotPro measurements. Five patients received fibrinogen supplementation during thrombolysis (1-6g). Additionally, based on available data, a dose range was defined with respect to body weight and body surface area (<50 μg/kg/h and <2 mg/m²/h), below which effective fibrinolysis was achieved without a critical reduction in the FIB test MCF value. In the C group, the treatment duration was 2 hours, and the total tPA dose was the prescribed 100 mg. In the C group, severe, treatment-impacting bleeding was observed in two cases (pericardial hematoma and gastrointestinal bleeding following thrombolysis after non-traumatic resuscitation, and in another patient, nasal bleeding followed by aspiration of blood requiring intubation). In the ClotPro group, one patient suffered an intracranial haemorrhage.In the control group, echocardiographic examinations showed significant improvement in right ventricular function in 4 cases, while in 2 cases, severe dysfunction persisted early on despite thrombolysis, and the right heart function could not be evaluated in the case of the aforementioned pericardial hematoma.In the study group, right ventricular dysfunction resolved in all cases, except for one patient known to have chronic thromboembolic pulmonary hypertension.

Conclusion. During ClotPro-guided extended thrombolysis for pulmonary embolism, effective revascularization was observed in almost all cases, compared to a lower clinically effective revascularization rate observed in the early phase of conventional therapy. Our results in the study group show no increased risk of clinically significant bleeding, and major coagulopathy or fibrinogenolysis can be avoided. Due to the incidence of the disease, a detailed statistical analysis of the patient population was not possible; therefore, we plan to confirm these results through a multicenter-controlled interventional trial.

FACTORS THAT INFLUENCE THE OUTCOME OF CARDIOPULMONARY RESUSCITATION

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Introduction: Sudden cardiac death (SCD) is a leading cause of mortality, accounting for approximately 15-20% of all deaths. Sudden cardiac death claims approximately one life every minute across continents. Survival rates are low, with spontaneous circulation returning in about 10% of cases. Numerous factors have been identified in connection with sudden cardiac death. Some of these are unchangeable, while others are modifiable cardiovascular risk factors. In the event of sudden cardiac arrest, prompt resuscitation may

be the only treatment. However, survival rates after cardiac arrest are influenced by various factors. Identifying these causative elements and underlying conditions is crucial, as they significantly impact the effectiveness and outcomes of critical care. Recognizing these factors not only enables the implementation of preventive strategies in medical care but also enhances survival rates and quality of life.

Patients and methods: We processed the data of 287 patients requiring care for sudden, non-traumatic out-of-hospital death and made a retrospectively analysis in the period of 01.10.2010-31.12.2013. We analysed the relationships between the time elapsed before resuscitation, initial heart rate, the effectiveness of bystander (non-professional) resuscitation, and patient outcomes. Our objective was to assess the neurological status of patients who underwent successful resuscitation at hospital discharge and to evaluate how risk factors leading to sudden cardiac death (SCD) influence resuscitation outcomes.

Results: It was observed that hypertension had a significant correlation with the negative outcome of resuscitation ($p=0.018$; $r=0.143$). In accordance with our calculations, the presence of hypertension poses 1.82-fold risk of unsuccessful resuscitation. Moreover, we also found a significant correlation between left ventricular hypertrophy and the unsuccessful resuscitation ($p=0.0009$; $r=0.1995$). Our calculations indicate that left ventricular hypertrophy (LVH) increases the risk of failed resuscitation by 5.1 times. Additionally, there is a significant positive correlation between advanced age and unsuccessful resuscitation. ($p=<0.017$; $r=0.1246$). In addition, correlation between the first documented rhythm and the success of resuscitation were also analysed. In cases of initial asystole, the use of the LUCAS device has been associated with improved chest compression quality and reduced hands-off time during resuscitation efforts. In the event of successful resuscitations, neurological end status was better in the case of manually resuscitated group ($p<0.05$). In successful resuscitations, patients who received manual chest compressions, exhibited better neurological outcomes compared to those who received mechanical compressions. Furthermore, the initial rhythm detected at the scene influences resuscitation success; for instance, patients presenting with pulseless electrical activity (PEA) have lower survival rates (only 30% success) compared to those with ventricular fibrillation (VF).

Discussion and Summary: In our study, advanced age, left ventricular hypertrophy (LVH), and hypertension were identified as significant factors adversely affecting resuscitation outcomes. Additionally, the initial rhythm detected at the scene influenced resuscitation success; notably, the presence of ventricular fibrillation (VF) was associated with a higher likelihood of return of spontaneous circulation. Our study definitively highlights that advanced age, left ventricular hypertrophy (LVH), and hypertension significantly decrease the success rates of resuscitation efforts. Interestingly, while conditions such as previous stroke and myocardial infarction might be expected to negatively impact resuscitation outcomes, our data did not show a decreased likelihood of success in these cases. This finding suggests that the structural and functional changes associated with LVH and hypertension could play a more crucial role in resuscitation efficacy than other comorbidities. Understanding these relationships is essential for developing targeted strategies to improve patient outcomes during resuscitative interventions.

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ASSESSMENT OF BASIC LIFE SUPPORT AND FIRST AID KNOWLEDGE LEVEL OF LICENSED SPORTS COACHES IN TURKIYE

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Objective: This research aims to evaluate the knowledge level of licensed sports coaches working in Turkey on basic life support (BLS) and first aid practices.
Methods: In the study, the survey form was transferred to an online platform after obtaining ethical approval and was distributed to coaches via social media applications. Before the implementation, participants were informed about confidentiality principles. The completion time for the survey was approximately 10 minutes. Data from coaches without a valid license were not included in the study. The collected data were analyzed using SPSS 27.0.
Results: The survey study included a total of 182 licensed sports coaches, of whom 149 (81.9%) were male and 33 (18.1%) were female. The average correct response rate among the coaches was calculated as 51.4%. The distribution of the participants' fields of activity was as follows: 25.8% (n=47) football, 14.8% (n=27) athletics, 11% (n=20) fitness, 8.2% (n=15) CrossFit, 6.6% (n=12) swimming, and 33.4% (n=61) other sports. No statistically significant difference was found between knowledge level and gender, age, prior first aid training, coaching license renewal, or education level. The statements with the highest number of incorrect answers were statement 10, "The resting heart rate of a healthy adult is between 60-80 beats per minute" (n=164, 90.1%), statement 3, "The sequence of Basic Life Support application in adults is A (Airway) - B (Breathing) - C (Circulation)" (n=151, 83%), and statement 7, "The point where chest compressions are applied is the upper 1/3 of the sternum" (n=146, 80.2%). The most correctly answered statements were statement 4, "The pulse areas used in first aid include the carotid arteries, femoral arteries, and radial arteries" (n=175, 96.2%), statement 20, "A suspected fracture should be immobilized, including the joint above and below the injured area, while avoiding sudden movements" (n=159, 87.4%), and statement 23, "To prevent spinal cord injury, the neck position should be stabilized" (n=156, 85.7%). The statements that received the highest number of "I don't know" responses were statement 15, "Before using an Automated External Defibrillator (AED), the electrode pads should be placed on the patient's chest as shown on the device" (n=88, 48.4%), statement 21, "In cases of dizziness, sweating, or blackout, squatting or clenching the fist should be applied" (n=59, 32.4%), and statement 14, "In pediatric Basic Life Support, the chest compression to rescue breath ratio is 15:2" (n=58, 31.9%).
Conclusion: Our study emphasizes the need for enhanced training in Basic Life Support, First Aid, and the use of Automated External Defibrillators (AED) within the coaching certification curriculum to better prepare licensed coaches for emergency situations.
Keywords**: First Aid, Basic Life Support, Coaching, Sport.**

THE KNIGHTS WHO SAY „NIV" - HOW THE NON-INVASIVE VENTILATION HELPS IN HUNGARIAN AMBULANCE PRACTICE

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Background: Respiratory failure care has come a long way during the pandemic. In the prehospital practice it offers essential help to patients and may help to avoid endotracheal intubation, if watchfully employed. According to the current literature, its use is highly beneficial in the management of AHF and CHF and in pathologies associated with carbon dioxide retention. In addition, several international studies have shown that monitoring end-tidal carbon dioxide can be used to follow pulmonary perfusion and respiratory status. In this study we observed the effect of certain therapeutic interventions in respiratory failure on end-tidal carbon dioxide.
Materials and Methods: Taking the data of the Hungarian National Ambulance Service, we conducted a comprehensive retrospective data analysis from 01.01.2019 to 31.12.2023. Patients with any form of non-invasive ventilation in their medical records were primarily included in the study. Out of these 2400 patients we had to exclude 1811 patients due to data deficiencies. Finally, 589 patients were selected for the study. We created 2 subgroups based on the cause of respiratory failure, which became the AHF/CHF group and the group of diseases associated with carbon dioxide retention. The study measured the effects of different drugs and therapeutic interventions on end-tidal carbon dioxide changes.
Results: For AHF/CHF, the mean initial ETCO2 was 31.11 Hgmm, but had decreased slightly to 30.9 Hgmm at the end of treatment. Nitroglycerin (p=0.423) and furosemide (p=0.359) had no significant effect on etCO2 in the AHF/CHF group the individuals of which were noninvasively ventilated. A significant etCO2 decrease at the end of treatment was observed with opiate (p=0.034). Norepinephrine and epinephrine also significantly reduced etCO2 (p=0.003). For the CO2 retention group, the mean initial ETCO2 was 39.17 Hgmm, but had decreased slightly to 36.14 Hgmm by the end of treatment. In groups with carbon dioxide retention, drug therapies - either with bronchodilators (p=0.387) or with steroids (p=0.381) - had no significant effect on etCO2. In the AHF/CHF group physician-assisted telephone consultation significantly improved the patient's condition (p=0.001)
Conclusion: Along NIV, in both (AHF/CHF and CO2 retention) group of patients, etCO2 had decreased slightly till the end of treatment, the importance of which is unclear. Examining certain elements of the parallel drug treatment, in the AHF/CHF group nitroglycerine and furosemide had no significant effect, while opiate, epinephrine and norepinephrine had, and in this group the telephone consultation with physician significantly improved the patient's condition (p=0.001). In the CO2 retention group, neither bronchodilators nor steroids had significant effect. Although these results somewhat differ from the expected, at least in part can be explained: NIV and conventional therapy are given in parallel, making difficult or impossible to separate their effects. Moreover it is well known from the international literature that nitrates and morphine reduce cardiac output and NIV itself has similar effect. Reduction in cardiac output leads to pulmonary hypoperfusion.. Being patients non-invasively ventilated, the measurement of ETCO2 is also non-invasive. These components,

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when added together, may explain the somewhat contradictory results. A further limitation was the significant data loss due to exclusion many patients. In conclusion, however, we can confirm that NIV is an effective and efficient therapy for both groups of patients. However, early oxygen reduction and telephone consultation should be applied more frequent. With this obervational study we took the first step to use a non-invasive, easy accessible parameter as a bechmark of prehospital therapy in certain group of noninvasively ventilated patient.

INVESTIGATION OF THE RELATIONSHIP BETWEEN LOCALIZATION OF LOWER EXTREMITY DEEP VEIN THROMBOSIS AND ASMULTANEOUS OR RECENT PULMONARY EMBOLISM DETECTED IN THE EMERGENCY SERVICE

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Objective: Pulmonary embolism is a preventable disease that has high mortality and is sometimes difficult to diagnose. It mostly occurs due to deep vein thrombosis (DVT). The aim of this study is to conduct a retrospective statistical study on which vein in the lower extremity deep venous thrombosis increases the risk of recent pulmonary embolism more and if a significant difference is detected in the result, the aim is to be more sensitive in terms of pulmonary embolism examination in patients with deep vein thrombosis in this vein if they are accompanied by possible pulmonary embolism symptoms or risk factors.
Materials and Methods: This study was conducted retrospectively at Istanbul University-Cerrahpaşa Cerrahpaşa Faculty of Medicine, Department of Emergency Medicine, after the ethics committee decision. The study was conducted with data obtained from the Hospital Information Management System and a 3-year retrospective review. Statistical distribution of DVT localizations of patients diagnosed with pulmonary embolism within the following 1 month were investigated in the group of patients with deep vein thrombus that was not evaluated as chronic in the lower extremity venous Doppler ultrasonography requested from the emergency department.
Results: The most common thrombous localizations in DVT patients were popliteal vein and superficial femoral vein. It was determined that the most common accompanying diseases in these patients were malignancy, HT and DM. It was observed that the 28-day mortality rate of DVT patients was 4.1%, while the 6- month mortality was 21.2% and 11.8% of all DVT patients were diagnosed with pulmonary embolism. Among the comorbidities, malignancy and coronary artery disease were significant in terms of 28-day mortality risk, while malignancy and COPD were significant in terms of 6-month mortality risk. It was determined that the most common DVT sites in patients who developed pulmonary embolism were the popliteal vein with 85% and the common femoral vein with 45%.
Conclusion: It has been shown that comorbidities, advanced age, high d-dimer levels, and pulmonary embolism accompanying this diagnosis have statistically significant effects on prognosis and mortality in patients who present with DVT 13 VIII symptoms and receive

this diagnosis. Although there were no statistically significant results, it was observed that some DVT localizations were more common in the pulmonary embolism group than in the general DVT group. These findings may have an important place in the diagnosis-treatment-clinical follow-up process and can be taken into consideration in decision-making processes. Thus, the outcome of venous thromboembolism patients can be improved.

Keywords: Deep Vein Thrombosis, Comorbidity, Mortality, Pulmonary Embolism, Emergency Room

CARDIOVASCULAR RISK ASSOCIATED WITH MORBID OBESITY AND THE CONSEQUENCES IN EMERGENCY CARE

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The epidemic spread of obesity causes a serious public health problem worldwide. According to various estimates, in Hungary, approximately 30% of the adult population is obese (BMI>30 kg/m2), based on which our country usually occupies a podium place among the "fattest" countries of the European Union. The increase in the prevalence of severe, also known as morbid obesity (BMI>40 kg/m2) among obese patients significantly exceeds the increase generally observed in the case of obesity. The care of morbidly obese patients means a significant burden on the entire healthcare system, and especially on emergency care, due to the drastic increase in cardiovascular risk – the frequent occurrence of heart failure, atrial fibrillation, stroke, coronary artery disease and venous thromboembolism. Obese patients represent a heterogeneous group in terms of cardiovascular risk, and different obesity phenotypes can be distinguished based on comorbidities. In order to reduce mortality, it would be essential to identify high-risk patients as soon as possible and to treat comorbidities at an early stage. In case of morbidly obese patients, our working group examined several biomarkers that can help and refine risk assessment, thereby promoting the timely identification of high-risk patients. In our presentation, we would like to demonstrate some novel markers for cardiovascular risk assessment in morbidly obese patients and our scientific results related to them. In addition, we would like to draw attention to the professional and logistical challenges associated with the emergency care of morbidly obese patients.

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COMPARISONS BETWEEN VENTILATION MODES AND OUTCOMES IN PATIENTS WITH COVID-19 SEVERE ACUTE RESPIRATORY DISTRESS SYNDROME

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Introduction: The respiratory support strategy is essential in treating acute respiratory distress syndrome (ARDS), a form of lung injury associated with high mortality. According to the literature, available data show that approximately 1/3 of patients hospitalized with the 2019 Coronavirus disease (COVID-19) develop ARDS, making it a frequent complication of COVID-19.
Objectives: This study aims to analyze breathing support therapy and outcomes in patients with COVID-19 and very severe ARDS comparatively, emphasizing the modes of mechanical ventilation before endotracheal intubation.
Material and Methods: We retrospectively analyzed 114 patients admitted with COVID-19 very severe ARDS in the Emergency Department of the County Emergency Hospital Resita, Romania, between 10/2020 and 12/2020. A total of 65 patients that met the inclusion criteria were included in the final sample. All the patients included met all the inclusion criteria even from the admission.
Results: Based on outcomes, patients were divided into 2 groups: survivors (n=10) and non-survivors (n=55). Patients were predominantly male (75% from the total number). It was shown that a slightly higher number of patients supported primarily with continuous positive airway pressure (CPAP) 23.08% survived compared to the two other patient groups supported just by high flow nasal cannula (HFNC) or by HFNC alternating with CPAP. This also accounted for patients that were mechanically ventilated after endotracheal intubation (ETI) and received previous support via CPAP (40% survival), whereas 10% survived with previously HFNC alternating with CPAP and no patients survived just treated with HFNC before ETI. Differences in survival were noticeable but not significant, as the number of patients were too few and the outcome groups unequal (10 survivors, 55 non- survivors).
Conclusion: This study shows that the first treatment option with CPAP has a slighter better outcome, but non-significantly. Further large-scale studies must evaluate effectiveness of both treatment option to draw and accurate results.
Keywords: COVID-19, very severe ARDS, ventilation modes, HFNC, CPAP,NIV, ETI

EVALUATION OF THERMAL IMAGING AND LUNG ULTRASONOGRAPHY IN PREDICTING OUTCOMES IN EMERGENCY DEPARTMENT PATIENTS WITH DYSPNEA

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Objective: The rapid and accurate assessment of dyspnea in emergency department (ED) patients is crucial for timely intervention and improved patient outcomes. Traditional imaging modalities such as computed tomography (CT) and lung ultrasonography (LUS) are commonly used; however, their reliance on radiation exposure, operator dependence, and limited accessibility pose challenges. Thermal imaging (TI), a non-invasive and radiation-free modality, has emerged as a potential complementary tool for evaluating pulmonary conditions. This study aims to assess the diagnostic and prognostic value of thermal imaging in comparison to lung ultrasonography for predicting clinical outcomes in patients presenting with dyspnea.

Materials and Methods: This prospective, observational study included 195 patients presenting to the ED with dyspnea between September 2021 and April 2022. An additional 30 healthy individuals were included as a control group. Simultaneous thermal imaging and lung ultrasonography were performed on all participants. Thermal imaging was conducted using the Meditherm Med/IRIS thermal camera under standardized conditions in a temperature-controlled room (22–24°C) to minimize external influences. Patients were positioned in an upright, relaxed state for five minutes prior to imaging to allow for temperature stabilization. LUS was performed using a low-frequency convex probe, systematically scanning anterior, lateral, and posterior lung fields to evaluate B-lines, pleural effusions, and consolidations. Sensitivity, specificity, and diagnostic accuracy of TI and LUS were compared against clinical diagnoses and patient outcomes, including ICU admission, length of hospital stay, and mortality. Thermal imaging assessments focused on identifying temperature differentials across specific body regions, including anterior and posterior thoracic surfaces, in both supine and upright positions. Regional temperature variations were analyzed to assess their correlation with pulmonary conditions and disease severity. To ensure accuracy, environmental variables such as airflow and humidity were controlled, and image acquisition was performed by trained personnel to minimize observer bias.

Results: Thermal imaging demonstrated significant correlations with pulmonary conditions such as pneumonia, chronic obstructive pulmonary disease (COPD) exacerbations, and pulmonary edema. The highest mean temperature differentials were observed in patients with lung masses, likely due to increased vascularization. For pneumonia, a temperature threshold of 0.6260 resulted in a sensitivity of 73% and specificity of 52%, while pulmonary

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edema detection yielded 71% sensitivity and 61% specificity. Among COVID-19 pneumonia patients, dorsal thoracic thermal gradients significantly differed from healthy controls ($p = 0.027$). In COPD exacerbations, asymmetric thoracic temperature distribution correlated with clinical severity. The analysis of body region-specific temperature variations revealed that increased right dorsal thermal gradients were significantly associated with higher three-month mortality rates (22.05%). Although LUS was superior for detecting pleural effusions and consolidations, thermal imaging showed promising diagnostic value in distinguishing pulmonary edema and inflammatory conditions.

Conclusion: Thermal imaging presents a novel, non-invasive approach for assessing pulmonary conditions in dyspneic patients, offering complementary insights alongside lung ultrasonography. While LUS remains the gold standard for diagnosing pleural effusions and consolidations, TI shows potential as a rapid triage tool, particularly in differentiating pneumonia, COPD exacerbations, and pulmonary edema. The assessment of regional temperature variations may further enhance its prognostic utility, particularly in predicting adverse outcomes such as mortality. Further research with larger cohorts is warranted to refine diagnostic thresholds and evaluate the clinical impact of integrating thermal imaging into emergency care protocols.

CAN WE CHANGE EMERGENCY MEDICINE CLINICIANS COMPETENCE AND CONFIDENCE WITH VR-SIMULATION? - A TRAINEES PERSEPECTIVE

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Introduction: Medical education has traditionally been a didactic experience where students are given information then required to assimilate and apply it on their own. VR-Simulation allows junior clinicians the opportunity to complete fully immersive high-fidelity simulations where they can make clinical decisions and apply clinical knowledge contemporaneously in emergency scenarios. VR-Simulations potential to provide a learning experience that can rival traditional simulation in emergency and disaster response has not yet been fully explore.

Methods: An exploration of VR-Simulations ability to improve competence was made by working through a library of emergency VR-Simulations. VR-Simulation was used as a flipped classroom method allowing scenarios to be completed in a both physically and psychologically safe environment using prior knowledge to highlight where trainees weaker areas lay thus allowing for more focused delivery of subsequent teaching.

Results: A growth mindset was crucial for individual success in the project, along with an understanding that this was intended to be a steep learning curve, not just to learn but also to identify areas of weakness. A perception of resilience through failure but also optimism for progress was expressed as trainees became more familiar with structured interactions such as A-E assessment and SBAR in VR. Performance improved quickly at first however would often plateau and the need for a facilitator to support simulation was recognised. Although

competence improved confidence did not always follow the same trajectory, factors such as tacit learning, inter-generational learning and a skilled facilitator are clearly key in delivering both traditional and VR Simulation.

PILOTING MEDICAL SIMULATION TECHNIQUES TO ENHANCE QUALITY IN THE EMERGENCY DEPARTMENT OF ALBANIA

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Background: Emergency departments (EDs) are challenging to manage due to their high volume, resource limitations, and increased patient demand. They rely on well-functioning teams to provide consistent and safe patient care, making them ideal environments for implementing innovative initiatives aimed at enhancing efficiency and service quality. Simulation techniques are an effective method for helping ED providers improve their multitasking abilities and prepare novice providers for real-world challenges. This study involved piloting a Simulation Program among ED providers at regional and university hospitals in Albania, focusing on self-reported improvements in multitasking efficiency and quality of care.
Methodology: A team of four senior ED trainers designed and conducted a series of training sessions for groups of ED providers from regional and municipal hospitals, focusing on clinical and teamwork skills related to Basic Life Support (BLS) and First Aid (FA). Several scenarios were developed to facilitate in situ simulated patient experiences. The DASH (Debriefing Assessment for Simulation in Healthcare) tool was used to assess the participants' feedback regarding the application of simulation techniques.
Results: To date, 30 three-day training sessions have been conducted, with the participation of 450 ED providers (almost two-thirds of whom were nurses). Preliminary qualitative data indicated significant improvements in multitasking efficiency and confidence in providing BLS and FA care. Additionally, findings demonstrated that this technique is both feasible and acceptable.
Conclusion: Although the program is still ongoing, the initial results suggest that piloting medical simulation techniques can effectively improve ED providers' multitasking efficiency and quality of care. Further in-depth analyses are necessary to better understand the long-term impact of this approach on clinical practice.
Keywords: emergency medicine, medical simulation techniques, quality improvement.

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CAN AUTHORING AND FACILITATING EMERGENCY SIMULATIONS PREPARE DOCTORS TO THE SAME LEVEL AS PARTICIPATING IN EMERGENCY SIMULATIONS??

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Introduction: The relatively recent addition of VR-simulation in medical education allows learners to be immersed in a pre-built emergency medicine scenarios and complete the same simulation in a near unlimited number of ways and times, all while being contained in a safe environment for both learner and patient. The process of designing simulations has traditionally been completed by facilitators or educators however, it seems likely that there is educational value in designing the simulations as well as simply participating when considering emergency medicine. This study compares two approaches to learning, the first being to practice an existing emergency VR-Simulation and the second is for the learner to create their own emergency VR-Simulation. The existing scenario was authored by a senior clinician with an interest in simulation. Students were then supported to design and develop their own VR-Simulation using UbiSims software. Learning experience, clinical knowledge and ability to apply knowledge were surveyed using reflective questionnaires before and after the learning event. Findings suggest that authoring simulation scenarios supports a deeper understanding of both clinical knowledge and management of acutely unwell patients. It would appear that both practicing and making emergency medicine scenarios is beneficial. However, creating a scenario encourages deeper learning for a more comprehensive understanding whilst practicing a scenario is a more effective for revision and less time consuming. There is limited research currently available on the usefulness of making scenarios in VR. This study highlights the value of integrating scenario authoring into medical education but acknowledges that furtherresearch with larger sample sizes and a wider range of management is needed to support these finding. This research addresses the gap in understanding active involvement in VR simulation authoring within in emergency medicine.

Keywords: Medical Education, Flipped Curriculum, VR-Simulation, Simulation Authoring
Note: Isabel Whyte and Imogen Clunie equally contributed to the presentation.

DEEP NECK INFECTION, MEDIASTINITIS, AND METHANOL INTOXICATION DUE TO DENTAL INFECTION: A RARE AND FATAL CASE

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Introduction: Deep neck infections can rapidly spread, leading to life-threatening complications such as mediastinitis. Early recognition and aggressive treatment play a crucial role in reducing mortality. This case presents a deep neck infection and mediastinitis secondary to a dental abscess, complicated by unrecognized methanol intoxication, which significantly worsened the septic status of the patient. This report highlights the importance

of multidisciplinary management, rapid diagnostic evaluation, and simultaneous treatment in critically ill patients.

Case Presentation: Patient Information & Chief Complaints:• Age & Sex: 47-year-old male• Medical History: Coronary artery disease (angioplasty + stent), regular use of aspirin (Ecopirin)• Presenting Complaints: Neck swelling, chest pain, and dysphagia• History:o Two months prior, the patient underwent an unsuccessful tooth extraction and subsequently experienced intermittent tooth pain but did not seek further dental care or use antibiotics.o History of frequent alcohol consumption.Physical Examination & Initial Assessment:• General Condition: Conscious, cooperative, and oriented• Vital Signs: Normotensive, tachycardic (HR: 144 bpm)• Oropharyngeal Examination: Uvula edema and rightward deviation• Respiratory System: Normal breath sounds Laboratory Findings: Test Day 1 Day 2 Day 3AST (U/L) 85 87 129ALT (U/L) 36 39 47ALP (U/L) 175 147 147 GGT (U/L) 362 316 316 Total Bilirubin (mg/dL) 4.3 4.2 3.6 Creatinine (mg/dL) 1.93 1.81 - CRP (mg/L) 299 308 308 Procalcitonin (ng/mL) 29.9 29.9 - Lactate (mmol/L) 13 20 24 Arterial Blood Gas pH 7.35 7.23 7.11 HCO3 (mEq/L) 17.3 12.9 9.9 INR 1.73 1.68 2.7 Radiological Findings:• Contrast-Enhanced Neck and Thorax CT:o Bilateral submandibular, sublingual, and para-pharyngeal involvement extending into the anterior mediastinum.o Extensive phlegmonous and abscess formation.o Right first molar defect, 2.5 cm pleural effusion on the right side.• Abdominal CT:o Heterogeneous contrast enhancement in the liver parenchyma, periportal edema.o Edema in the gallbladder bed, consistent with acute hepatitis. Clinical Course & Consultations: Day 1 – Emergency Department Management:• Initiation of broad-spectrum antibiotics (Tazocin + Linezolid).• Intravenous hydration, oxygen support, and close monitoring.• Patient denied alcohol use during the initial anamnesis.• Stabilization followed by contrast-enhanced CT imaging.• ICU admission planned, but due to unavailability, the patient was managed in the emergency department.• Tracheostomy consent obtained in case of potential airway obstruction.Day 2 – Deterioration & Sepsis Progression:• Progression of mediastinitis, development of empyema → Thoracic surgery consultation and drainage performed.• Progressive deterioration of consciousness, worsening lactic acidosis.• Noradrenaline infusion initiated, patient transferred to intensive care unit (ICU).ICU Course:• Worsening mental status necessitated endotracheal intubation, sedation, and mechanical ventilation.• Persistent lactic acidosis required bicarbonate infusion.• Family members were interviewed again for a detailed history.• Revised history revealed recent heavy alcohol consumption due to severe tooth pain.• Suspicion of methanol intoxication emerged.• Empirical treatment with enteral ethanol infusion initiated.• Hemodialysis commenced.• Methanol level confirmed at 15 mg/dL.

Discussion:• Deep neck infections (DNIs) are rapidly progressive infections that can extend into the mediastinum, causing mediastinitis and sepsis with high mortality rates.• This case was initially managed as severe sepsis due to odontogenic deep neck infection. However, progressive lactic acidosis despite optimal sepsis management raised suspicion for an alternative etiology.• A detailed history uncovered a significant predisposing factor—recent heavy alcohol consumption—leading to the suspicion of methanol poisoning.• Coexisting methanol intoxication further exacerbated the metabolic acidosis and multi-organ failure.• Despite timely interventions including mechanical ventilation, ethanol infusion, and hemodialysis, the patient succumbed to cardiac arrest.

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Conclusion: 1. Deep neck infections can rapidly progress to life-threatening mediastinitis and sepsis, necessitating early diagnosis and aggressive treatment. 2. Unexplained lactic acidosis in critically ill patients should prompt consideration of toxic etiologies, including methanol poisoning. 3. A thorough and repeated history-taking is essential in cases of refractory metabolic acidosis. 4. Despite early ICU transfer, aggressive resuscitation, and toxicology-directed therapy, this case had a fatal outcome, highlighting the complexity of dual-pathology presentations.

GUILLAIN-BARRÉ SYNDROME IN THE EMERGENCY DEPARTMENT: CLINICAL CHARACTERISTICS AND DIAGNOSE

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Introduction. Guillain-Barré Syndrome (GBS) is an immune-mediated disease of the peripheral nervous system characterized by an acute onset, progressive, symmetrical muscle weakness, and areflexia. In most cases, a preceding infection history is present, with Campylobacter jejuni, cytomegalovirus (CMV), and Epstein-Barr virus (EBV) frequently implicated as etiologic agents. Although rare, GBS has high morbidity and mortality rates, with approximately 20% of patients developing respiratory failure requiring mechanical ventilation. The emergency department (ED) is a frequent point of care for GBS patients, where early diagnosis and appropriate treatment are crucial factors directly influencing prognosis. However, the clinical heterogeneity of GBS can lead to diagnostic delays. Patients presenting with hyperreflexia instead of classical hyporeflexia or areflexia may be misdiagnosed and discharged with alternative diagnoses. This study aimed to evaluate the clinical characteristics, presenting complaints, diagnostic processes, and prognosis of patients diagnosed with GBS in the ED.

Methods. This retrospective study included patients diagnosed with GBS and admitted to the neurology department from the ED between 2020 and 2025. Demographic data, presenting symptoms, time to diagnosis, laboratory findings, and treatment approaches were analyzed.

Results. A total of 41 patients were included in the study, of whom 23 (56%) were male. The primary presenting symptoms were muscle weakness (56.1%), paresthesia (36.6%), and dysphagia (7.3%). While 36.6% of patients exhibited no signs of infection, 31.7% presented with upper respiratory tract infection (URTI) symptoms. A history of previous infection with COVID-19, CMV, or EBV was reported in 2.4% of cases each. The most common admission periods were December–February (36.6%) and March–May (36.6%). The mean time to diagnosis was calculated as 19.37±13.08 hours in the emergency department. Most patients received intravenous immunoglobulin (IVIG) therapy (90.2%), plasma exchange therapy was administered in 2.4% of cases.

Conclusion. Despite muscle weakness and paresthesia being the predominant presenting complaints, the diagnostic process in the ED is often prolonged, highlighting potential delays in recognizing GBS. Additionally, seasonal variations suggest a correlation with peak viral

respiratory infections, emphasizing the need for heightened awareness during these periods. Clinicians in the ED should maintain a high index of suspicion for GBS in patients presenting with relevant neurological symptoms, ensuring timely diagnosis and management, particularly in atypical cases.

Keywords: Guillain-Barré Syndrome, Emergency Department, Neurological Emergencies

COMPARISON OF FOUR SCORE AND GLASGOW COMA SCALE IN PREHOSPITAL ASSESSMENT OF TRAUMATIC BRAIN INJURY PATIENTS IN SLOVENIA

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Background. Traumatic brain injury (TBI) requires rapid and accurate neurological assessment to guide early intervention and improve patient outcomes. The Glasgow Coma Scale (GCS), ranging from 3 to 15, assesses consciousness based on eye, verbal, and motor responses. However, in intubated patients, its inability to assess verbal responsiveness can lead to an artificially lower score, potentially underestimating neurological function. The Full Outline of UnResponsiveness (FOUR) score, ranging from 0 to 16, overcomes this limitation by incorporating brainstem reflexes and respiratory patterns, providing a more comprehensive neurological assessment. This study aimed to determine which scoring system—GCS or FOUR—better predicts short- and long-term outcomes in prehospital TBI patients.

Material and Methods. A prospective observational study was conducted on 200 TBI patients managed by a prehospital emergency response team. GCS and FOUR scores were recorded at three time points: initial prehospital contact (GCS1, FOUR1), post-intervention in the field (GCS2, FOUR2), and at hospital handover (GCS3, FOUR3). Patient outcomes were assessed at 24 hours, 1 month, and 3 months post-injury. Statistical methods included receiver operating characteristic (ROC) curve analysis, Youden's index, McNemar's test, and Z-score analysis, with $p < 0.05$ considered statistically significant.

Results. Both scores demonstrated strong predictive accuracy for mortality. However, FOUR was more reliable in intubated patients, as GCS inherently assigns a lower score in the absence of verbal responses, whereas FOUR evaluates brainstem function and respiratory drive, offering a more precise assessment. Sensitivity and specificity analysis showed that a FOUR score ≤6 achieved 88% sensitivity and 82% specificity, while a GCS score ≤8 reached 85% sensitivity and 80% specificity. The FOUR score showed significantly better predictive accuracy in intubated patients (AUC 0.90 vs. 0.83, $p = 0.012$), whereas no significant difference was observed in non-intubated patients ($p = 0.23$, McNemar's test).

Conclusions. While GCS remains the standard neurological assessment tool, the FOUR score

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provides key advantages in intubated patients, offering a more accurate evaluation of brainstem activity and respiratory function. The integration of both scoring systems in prehospital care may enhance early prognostication and triage accuracy, particularly in severely injured patients. This combined approach can improve the identification of high-risk individuals, refine triage decisions, and ensure more effective communication between prehospital and hospital teams, facilitating timely neurosurgical or intensive care interventions.

Limitations. This study is subject to selection bias, as it includes only patients transported by a specific EMS service, potentially limiting generalizability. Variability in injury severity, patient demographics, and inter-rater reliability may have influenced results. Additionally, as the study focused on mortality outcomes, further research should explore long-term functional recovery and assess the clinical impact of integrating GCS and FOUR in prehospital triage protocols.

KETAMINE AND BENZODIAZEPINE SYNERGISTIC TOXICITY: EVALUATION OF THE INTRAVENOUS LIPID THERAPY APPROACH

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Introduction: In recent years, there has been an observed increase in the misuse of ketamine. Ketamine intoxications frequently occur in the context of multiple substance ingestion. This case highlights the development of cardiac adverse effects, multiorgan failure, and a complex clinical course secondary to the combined use of ketamine and benzodiazepines. In such scenarios, the patient's hemodynamic instability necessitates considering intravenous (IV) lipid therapy as an alternative approach in emergency management.

Case Presentation: A 46-year-old male presented to the emergency department with a deteriorated general condition. The patient, who was reported to have poor self-care and to live alone, stated that he had been using ketamine. His medical history was notable for a previous aortic valve replacement and a gluteal abscess following an intramuscular B12 injection. His current medications included warfarin, a beta-blocker, and aspirin, which had been discontinued one week prior. On physical examination, although the patient appeared toxic, no significant pathological findings were noted. Arterial blood gas analysis revealed lactic acidosis (pH 7.38, lactate 15 mmol/L, HCO_3 14.3 mmol/L), and an electrocardiogram (ECG) demonstrated a left bundle branch block (LBBB). During the course of his management, the patient developed tachypnea and dyspnea. An attempt was made to initiate non-invasive mechanical ventilation (NIMV); however, due to a decline in his level of consciousness, rapid sequence intubation (RSI) was performed. Laboratory studies revealed elevated creatine kinase (CK) levels and prolonged INR, and urine toxicology confirmed the presence of cannabinoids and benzodiazepines based on his substance use history. Despite supportive therapy, his hemodynamic instability worsened, necessitating vasopressor support. Subsequently, due to the development of bradycardia, atropine was administered, but the patient went on to experience pulseless ventricular tachycardia (VT).

Cardiopulmonary resuscitation (CPR), synchronized cardioversion, and administration of amiodarone successfully restored sinus rhythm. Owing to an inotrope-refractory toxic shock syndrome, a 20% IV lipid infusion was initiated. Following lipid therapy, the patient's cardiac rhythm and hemodynamic status improved, and he was extubated 8 hours later. Post-extubation, the patient reported that, due to a gluteal abscess, he had been receiving 1 mg intramuscular ketamine for three days, along with oral diazepam for alcohol withdrawal, and admitted to cannabis use. Although the reliability of the history is debatable, it was observed that even low doses of ketamine and benzodiazepines precipitated severe cardiac toxicity.

Discussion: case demonstrates that ketamine intoxication often occurs in the setting of polypharmacy, and the concomitant use of central nervous system depressants such as benzodiazepines may result in synergistic toxicity. While the isolated use of ketamine has been associated with alterations in consciousness, hypertension, and cardiac arrhythmias, the combination with benzodiazepines—even at low doses—can precipitate life-threatening conditions, including pulseless ventricular tachycardia secondary to toxic shock syndrome.The rationale for choosing intravenous lipid therapy in this case was primarily based on the patient's hemodynamic instability and the inadequate response to conventional treatments. IV lipid infusion functions through a "lipid sink" mechanism, which reduces the free concentration of lipophilic drugs in the plasma and limits their tissue distribution. Although this approach has proven effective in local anesthetic toxicity, it also offers promising results in cases of synergistic toxicity involving ketamine and benzodiazepines. This case underscores that even low doses of ketamine and benzodiazepines can result in significant cardiac toxicity, and highlights the potential role of IV lipid therapy as an alternative in the emergency management of such complex intoxications.

THE EFFECTIVENESS OF DISULFIRAM IN INDIVIDUALS WITH ALCOHOL DEPENDENCE FOLLOWING RESIDENTIAL TREATMENT IN ALBANIA

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Background: Alcohol abuse is a significant public health concern in Albania, accounting for 4.2% of all deaths in the country. Efforts to address this issue are fragmented, with only one toxicology department serving the entire nation's needs. Currently, the pharmacological treatment options for Alcohol Use Disorders (AUDs) are limited and disulfiram is part of the treatment protocol. While disulfiram has benefits, its effectiveness in preventing and treating AUD has been controversial. This study aims to assess the manifestations of the Disulfiram-alcohol reaction (DER) in patients being treated for alcohol dependence in Albania.

Methods: Fifty patients hospitalized at the University Hospital Toxicology Department in Albania, diagnosed with alcohol dependence based on ICD-10 criteria, were recruited and followed for one year (2023). They were randomly assigned to one of two treatment groups: one receiving disulfiram only, and the other receiving disulfiram in conjunction with additional therapy for other substance use disorders. The assessment criteria focused on

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evaluating differences between the two groups concerning the development of DER.
Results: The use of disulfiram positively impacted short-term abstinence and the time until relapse, especially during the first three months post-hospital discharge. However, 70% of the participants developed DER symptoms after three months, with no significant difference observed between the two groups. The most commonly reported DER symptoms included flushing, sweating, and tremors; one individual even experienced an acute myocardial infarction. Among those who did not develop DER symptoms, nearly 80% were in the disulfiram-only group, which also received psychological support for treatment.
Conclusion: The findings of this study reinforce global evidence suggesting that disulfiram used as a standalone treatment is ineffective in promoting long-term abstinence. When combined with psychosocial interventions and support, the risk of developing DER symptoms decreases significantly. Community-based psycho-pharmacological programs need to be developed to enhance access for this population.
Key Words: Disulfiram; Alcohol Abuse; Disulfiram-Ethanol Reaction

PEDIATRIC EMERGENCY DEPARTMENT MANAGEMENT IN ACUTE POISONING A 2-YEAR RETROSPECTIVE STUDY

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Background: Poisonings in children are common reasons for addressing ED and can potentially have serious complications. Our research aims to review risk factors leading to poisoning in children as well as the main cases of poisoning that required emergency medical assistance.
Methods: The study encompassed a retrospective descriptive analysis. Data were collected over a two-year period from patients under 18 years of age, who presented with poisoning at the largest Pediatric Emergency Department (ED) in North-East Romania.
Results: We collected data on 797 children admitted for acute poisoning (51.7% male and 48.3% female). The highest prevalence of intoxications was observed within the age group of 12–18 years (49.44%, 394 cases), followed by the age group of 1–3 years (23.34%, 186 cases), with the majority (65.9%) hailing from rural areas. The distribution of voluntary versus unintentional poisonings was relatively balanced: 50.19% versus 47.43% (for some cases the type of intoxication remained unknown). Exposure to the toxic substance by ingestion was significant compared to the other routes, with an incidence of 87.1%. Acute poisoning happened at home in 70.4% of cases. A known risk factor before reaching the ED was present in 13.04%. Most patients sought care at the ED within a median time interval of 3.53 hours post exposure to the toxic substance. Predominant symptoms encompassed neurological manifestations in 34.76% of cases and gastrointestinal symptoms in 26.5% of cases. The clinical severity of the majority of cases was classified as mild to moderate, with only 4.52% of patients requiring admission to Intensive Care. No fatalities were recorded.

Conclusions: Our study showed a greater risk for acute poisoning in children between 1–3 years of age, and adolescents over 12 years. Managing an intoxicated patient necessitates a multidisciplinary approach professional experience, and clinical intuition (often challenging or absent medical history, limitations in toxicological identification), alongside comprehensive clinical and paraclinical assessment and swift therapeutic intervention, with the time-to-toxin relationship decisively impacting the course of these cases.
Keywords: children; pediatric; poisoning; toxics; emergency care;

CORRELATIONS BETWEEN DRUG LEVELS IN BIOLOGICAL SAMPLES AND SYMPTOMS OF PATIENTS IN EMERGENCY DEPARTMENT

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Aims. This study analyzes correlations between emergency symptomatology and toxic levels detected in biological samples to establish a cause-effect relationship useful for diagnosis and treatment.
Material and methods. Comparative study was conducted on drug levels in blood and urine, correlating them with neurological, cardiovascular, and digestive symptoms in patients presenting in an emergency department of a county hopsital in Romania. Statistical analysis included descriptive parameters and Mann-Whitney/Kruskal-Wallis tests, given the small sample size and non-normal distribution (verified via Kolmogorov-Smirnov test).
Results. Toxicological analysis identified seven substances. Amphetamine (17.6%) was linked to neurological and gastrointestinal symptoms, including swoon states, epigastric pain, and nausea. Methamphetamine (9 cases) was associated with syncope and dyspnoea, with affected patients showing significantly higher blood levels. High ketamine levels correlated with epigastric pain, while morphine was linked to psychomotor agitation, vertigo, and nausea. Benzoylecgonine (35 cases) was significantly associated with psychomotor agitation, coma, vertigo, syncope, and sinus tachycardia. Methadone was linked to asthenia, euphoria, myalgias, vertigo, and vomiting. Delta-9-tetrahydrocannabinol (50 cases) was significantly correlated with asthenia, euphoria, palpitations, syncope, and epigastric pain.
Conclusion. Neurological symptoms were linked to high urinary morphine, benzoylecgonine, and Delta-9-tetrahydrocannabinol levels, with methadone detected in blood. Cardiovascular symptoms correlated with high urinary benzoylecgonine and D9THC, and elevated blood morphine, ketamine, and D9THC. Gastrointestinal symptoms were associated with elevated amphetamine, morphine, and ketamine blood levels.

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PHARMACOBEZOARS: THE HOLISTIC APPROACH

Dávid Magócs
PÉTERFY SÁNDOR UTCAI KÓRHÁZ SBO ÉS KLINIKAI TOXIKOLÓGIA, ANESZTEZIOLÓGIAI ÉS KÖZPONTI INTENZÍV OSZTÁLY

Objective: Potassium poisoning is not very common, and in patients with intact renal function a large amount of potassium has to be taken for the development of life-threatening hyperkalaemia. Certain pharmaceutical products, however, tend to conglomerate in gastrointestinal tract [1] which affects the risk and severity of poisoning. We report a case of severe poisoning after pharmacobezoar formation.
Case report: A 47-year-old woman with negative past medical history was admitted to the toxicology department after self-administering 50 potassium chloride tablets in a suicide attempt. It was not known whether the tablets were immediate or modified release as the patient had bought them via the Internet and no details were available. The tablets were taken 1.5 hour before her admission. On admission she was alert, vital parameters were stable, physical examination was unremarkable. Arterial blood gas showed no acid-base disturbance, but moderate hyperkalaemia was detected (6.7 mmol/L). Normal sinus rhythm and peaked T-waves on the precordial leads were demonstrated by electrocardiography (ECG). Gastric decontamination did not retrieve any tablet fragments. Antero-posterior abdominal X-ray revealed a mass in the stomach as a conglomerate of a large number of tablets. Repeated gastric decontamination carried out in Trendelenburg position was not successful. Repeated arterial blood gas analysis showed increased serum potassium concentration, and on the ECG T-waves became progressively worse. In spite of complex conservative therapy (calcium gluconate, sodium bicarbonate, glucose-insulin therapy, polystyrene sulfonate suspension, furosemide) the serum potassium concentration did not decrease. The decision was taken to perform intestinal decontamination and 39 whole intact tablets were removed by urgent upper panendoscopy. This intervention resulted in rapid improvement of the serum potassium concentration.
Conclusion: The potassium tablets in this case were radio-opaque and were seen on abdominal X-ray. In case of a mass overdose always consider the possibility of a pharmacobezoar. Potential life-threatening pharmacobezoars can be successfully removed by urgent gastroscopy. Multidisciplinary thinking and management can help in the holistic approach to treatment.

RETROSPECTIVE ANALYSIS OF PATIENTS DIAGNOSED WITH BILIARY SYSTEM DISEASES IN THE EMERGENCY DEPARTMENT

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Objective: Biliary system diseases, including cholecystitis, cholangitis, gallstones, and obstructive biliary conditions, are among the most common causes of emergency department

(ED) visits worldwide. This study aims to analyze the demographic characteristics, comorbidities, diagnostic approaches, treatment methods, and clinical outcomes of patients diagnosed with biliary system diseases in the ED. By identifying common trends and risk factors, this study seeks to provide valuable insights for emergency physicians in the management of biliary emergencies.

Method: This retrospective study was conducted at Istanbul University-Cerrahpaşa, Cerrahpaşa Medical Faculty, Emergency Medicine Department, covering the period from January 1, 2021, to December 31, 2022. A total of 491 patients diagnosed with biliary system diseases were initially screened. After excluding 84 patients due to incomplete records, refusal of treatment, or leaving the ED without permission, 407 patients were included in the study. Data on age, gender, comorbid conditions, laboratory parameters, imaging findings, and final diagnoses were collected and analyzed. Statistical evaluations were performed using IBM SPSS 29 software, with a significance level of $p<0.05$.

Results: A total of 491 patients were diagnosed with biliary system diseases, and 407 of these patients met the inclusion criteria. The incidence rate of biliary system diseases among all emergency department (ED) admissions in our hospital was 0.4%. Among the included patients, 54.3% were female and 45.7% were male, with a mean age of 56.85 years. Biliary system diseases were more prevalent in women than in men, and both their incidence and the risk of complications increased with age. The most frequently diagnosed biliary system disease in the ED was acute cholecystitis, followed by obstructive biliary system diseases. Abdominal pain was the most common presenting complaint among patients with biliary system diseases. Ultrasonography (USG) was the most commonly used diagnostic imaging modality. In 67% of cases, multiple imaging modalities were utilized for diagnosis, whereas in only 24% of patients, the diagnosis was established solely through USG. Gallstones were identified as the underlying etiology in 78.3% of biliary system diseases. Approximately 90% of patients diagnosed with biliary system diseases required hospitalization, with an average length of stay of 10.21±10.22 days. Conservative treatment was the most commonly preferred management strategy, and this approach remained consistent across different diagnostic groups. The overall in-hospital mortality rate for biliary system diseases was found to be 7%. Among all biliary system diseases, cholangitis had the highest mortality rate at 20%, followed by obstructive biliary tract diseases.

Conclusion: Acute cholecystitis emerged as the most common biliary system disease encountered in theED, although 37 patients had more than one biliary diagnosis simultaneously. The findingsunderscore the complexity of biliary system diseases, which often present with overlappingsymptoms and require a multimodal diagnostic approach. Although variations exist inetiology and treatment strategies, common management principles remain dominant. Thestudy highlights that biliary diseases are more frequently observed in women than in men, and the incidence and complication rates increase with age. Given the high hospitalization rates and potential complications, early recognition and appropriate management of biliary system diseases in the ED are crucial for optimizing patient outcomes.

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POCT FOR EARLY DETECTION OF ACS IN ED OF UHCMT, ALBANIA

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Introduction: Acute Coronary Syndrome (ACS) is a prevalent diagnosis for those who present to the ER. Delays in diagnosing Non-STEMI generate patient health problems, emergency room overcrowding, increased management costs, and staff burnout.
Methods: Albania is in a high-risk region for cardiovascular disorders, which are the major cause of mortality. The ESC 2023 guidelines recommend "Rapid 'rule-in' and 'rule-out' algorithms" based on a 0/1 hour or 0/2 hour troponin approach for the management of ACS. QSUNT is Albania's largest facility for acute coronary syndromes management and treatment. The implementation of this strategy in our country has been delayed by logistical challenges and a large volume of patients in the emergency department. Patients who skip referral processes and come untreated worsen the issue. POCT troponin is troponin at the point of care, which may be performed quickly and easily by non-specialists.
Results: We are now attempting to evaluate the effectiveness of POCT-troponins in Acute Coronary Syndrome in QSUNT accompanied by a HEART score and followed up for 6 weeks for major events, in contrast to troponin's measure from the central laboratory. The main advantage of POCT-troponins is their rapid reaction time.
Conclusion: What has to be determined is the level of security provided by POCT in the 'rule-in' and 'rule-out' of patients with ACS, as well as the usefulness of this test in the Albanian population as a tool for rapid and safe triage of these patients in the emergency department.
Keywords: POCT, HEART score, Acute Coronary Syndrome, "Rule -in Rule -out"

IMPROVING PAIN CONTROL AND PATIENT EXPERIENCE IN ADULTS PRESENTING WITH RECURRENT HEADACHES IN THE EMERGENCY DEPARTMENT

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Introduction: Non-traumatic headache in adults is a common complaint in emergency care, with up to 6-10% prevalence. These patients have a history of longstanding, relatively treatment-resistant pain and associated complaints such as photophobia, nausea, dizziness. Local anaesthetic block of the occipital major nerve (GONB) is an increasingly popular treatment modality in the emergency management of adult patients with occipital neuralgia/migraine. Interestingly, spinal mobilisation and/or massage became the second most commonly used alternative treatment method alongside oral/parenteral therapy in migraine management in the USA. GONB is a safe and cost-effective intervention, the technique is easy to learn. However, according to literature and our own experience, the success rate of this technique varies widely, from 42% to 95%. To achieve more effective pain

relief, we have conducted research in two directions. On the one hand, inspired by the success of manual therapy, we audited a retrospective cohort to assess the prevalence of scoliosis/spinal asymmetry among patients with headache, and on the other hand, to improve the success of GONB, we revisited the anatomy of the nuchal area with the help of the Cadaver Lab of the Institute of Anatomy at Semmelweis University.

Methods: To investigate the first endpoint, we performed a retrospective audit, reviewing the available imaging of discharged from the Emergency Department of Semmelweis University and from a teaching practice of the Department of Family Medicine with a diagnosis of headache in the months 2024.01-06 to determine the association between headache and cervical/spinal asymmetry. On the other hand, with the help of the Institute of Anatomy, detailed occipital dissections were obtained to better understand the relationship between the occipital nerves and occipital fasciae/muscle compartments. On prepared cadavers, under ultrasound guidance we infiltrated Omnipaque contrast dye into the fascia compartment of the greater occipital nerve and analyzed the compartmental spread of the contrast agent with CT scan.

Results: We reviewed the available imaging (CXR, Spine XR, spinal CT and/or MRI) of 134 patients. The demographic characteristics of patients with headache showed considerable heterogeneity. We observed a significantly higher prevalence of spinal asymmetry in the study cohort than in the control population. Our anatomical studies have raised the importance of a possible anatomical shunt, the so-called Cruvhelier plexus, which connects the C2-C3 and C4-C5 segments and has not been excessively studied in this clinical context. Surprisingly, the Cruvhelier develops in only 40% of humans. It has also been shown that neither the branches of the occipital nerve nor the abovementioned plexus run in a common fascia compartment, i.e. a single fascia block does not allow these nerves to be properly anaesthetised.

Discussion: The higher prevalence of spinal asymmetry in headache may raise the possibility of a potentially unobserved aetiological role of certain musculoskeletal factors, but due to the low number of participants/centres, false positivity (Type 2 error) is conceivable. Further multicentre prospective studies are needed to mitigate confounders/biases. After reviewing the nuchal anatomical preparations, it became apparent that the occipital nerves and the Cruvhelier plexus do not run in one single common compartment. This may explain the large variance in the success of GONB (insufficient drug spread between fascia compartments). In view of the above, we opine that in occipital headaches, instead of volume block, local anaesthetic infiltration of the major occipital muscles might also be considered, since both the occipital major, minor and tertiary nerve and the Cruvhelier plexus also pierce these muscles. Intramuscularly administered local anaesthetics have been documented to block the propagation of the pain in the large back muscles (intramuscular innervation zone, anterograde block on the occipital nerves and retrograde block in the Cruvhelier plexus, if present).Stimulation of nerve endings in the nuchal region is a popular method in both acupuncture (the GON corresponds to one of the most commonly accessed point in headache treatment - GB 20) and myofascial massage therapy. However, it is beyond the scope of our study to further investigate such alternative methods.

Conclusion: Our results suggest that patients with headache may have a higher incidence of

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spinal asymmetry/scoliosis than the control population. We believe that due to changes in nuchal mechanics (narrowed space between the cervical muscles and subsequent compression on the occipital nerves and connective tissue) may play potential etiological role in occipital headache. Literature and our own experience demonstrate that occipital nerve infiltration (GONB) offers a cost-effective and safe solution for the treatment of occipital headaches. However, further prospective neurophysiological and clinical research may be needed to clarify whether volume block or intramuscular injection is a more effective treatment in this cohort.

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