DRUŠTVO LEKARA URGENTNE MEDICINE SRBIJE
SERBIAN SOCIETY OF EMERGENCY PHYSICIANS
ISSN 2466-2992 (Online)

see journal
of emergency and disaster medicine

Southeast European Journal of Emergency and Disaster Medicine
Open Access Journal of Serbian Society of Emergency Physicians
Suppl 1/2026

SERBIAN SOCIETY OF EMERGENCY PHYSICIANS
THE 11h INTERNATIONAL CONGRESS

ABSTRACT BOOK

Vlasnik i izdavač/Owner and publisher:
Društvo lekara urgentne medicine Srbije/Serbian Society of Emergency Physicians

Web: www.seejournal.rs
E-mail: seejournal.office@gmail.com

Izvor: www.milicaz.com

APPRECIATION TO Dr Milica Živadinović

We extend our sincere gratitude to **Dr Milica Živadinović** for her exceptional support, guidance, and inspiration in the realization of the **11th Congress of the Serbian Society of Emergency Medicine**. Your dedication, expertise, and willingness to share knowledge were invaluable throughout every stage of preparation and execution.

With your energy, professionalism, and personal commitment, you provided strong motivation to the entire team and contributed significantly to the success, quality, and recognition of this congress.

With deep respect and appreciation,
Congress Organizing Committee
Pirot, 2026.

Southeast European Journal of Emergency and Disaster Medicine
Open Access Journal of Serbian Society of Emergency Physicians
Volumen XII, Supplement 1, ISBN - 978-86-909396-0-2

VLASNIK I IZDAVAČ

Društvo lekara urgentne medicine Srbije
Bulevar Nemanjića 19/33,
18000 Niš

Časopis izlazi dva puta godišnje kao Open Access Journal na stranici www.seejournal.rs

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The journal is published two times a year as an Open Acess Journal on www.seejournal.rs

Editorial adress
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Southeast European Journal
of Emergency and Disaster Medicine
Vol. XII, Year 2026, Suppl. 1

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EUROPEAN SOCIETY FOR EMERGENCY MEDICINE

SERBIAN SOCIETY OF EMERGENCY PHYSICIANS
THE 11th INTERNATIONAL CONGRESS

ABSTRACT BOOK

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Acknowledgment to the Pirot Branch of the Serbian Medical Society

Serbian Society of Emergency Physicians extends its sincere and profound gratitude to the Pirot Branch of the Serbian Medical Society for its exceptional support and collaboration throughout the preparation and realization of this year's congress.

Your dedication, professionalism, and readiness to contribute to every segment of the organizational process significantly enhanced the success of the congress held in Pirot from May 21 to 23, 2026. We especially value your hospitality, openness, and commitment to strengthening the professional community of emergency medicine in Serbia.

Thank you for your work, energy, and enthusiasm, which enabled Pirot to once again host a gathering that promotes knowledge, cooperation, and advancement in our field.

As a token of appreciation, the Organizing Committee expresses its deep respect and looks forward to continuing this successful collaboration in the years to come.

MANAGEMENT OF A CHILD WITH A FOREIGN BODY IN THE AIRWAYS - ANESTHESIOLOGY'S ASPECT

Vesna Marjanović [1,2], Ivana Budić [1,2], Jelena Lilić [1], Aleksandar Nikolić [1,2], Vesna Dinić [1,2], Marija Stošić [2,3], Lazar Marjanović [4], Milan Elenkov [5]
[1] UNIVERSITY CLINICAL CENTER NIŠ, CLINIC FOR ANESTHESIA, REANIMATOLOGY AND INTENSIVE THERAPY; [2] UNIVERSITY OF NIŠ, FACULTY OF MEDICINE; [3] UNIVERSITY CLINICAL CENTER NIŠ, CLINIC FOR CARDIAC SURGERY; [4] UNIVERSITY CLINICAL CENTER NIŠ, CLINIC FOR HEMAROLOGY, ALLERGOLOGY, AND CLINICAL IMMUNOLOGY; [5] GENERAL HOSPITAL OF PIROT, DEPARTMENT OF ANESTHESIA AND INTENSIVE CARE

A foreign body in the airways of children is an urgent condition, which most often occurs at less than 3 years old, due to age, developmental and anatomical characteristics, social-ecological factors and comorbidities. The most common symptoms and signs of a foreign body in the airways are sudden cough, suffocation, stridor, cyanosis, tachypnea, wheezing, respiratory distress and the absence of breath sounds on the side of the obstruction. These symptoms and signs in children require the use of rigid bronchoscopy as the gold standard in foreign body extraction under general anesthesia. Before performing general anesthesia, it is recommended to premedicate these patients with atropine and steroids in order to reduce airway secretions, avoid reflex bradycardia and prevent airway edema after bronchoscopy. On the contrary, sedation is not recommended for them due to the additional depression of breathing. Of the anesthesia techniques, it is recommended to use inhalational or intravenous anesthesia, while ensuring spontaneous breathing. Some authors favor intravenous anesthesia in children due to achieving a satisfactory depth of anesthesia, regardless of their degree of alveolar ventilation. At the same time, pulse oximetry, capnography, ECG and non-invasive blood pressure measurement are considered mandatory, standard monitoring during general anesthesia. After anesthesia and removal of the bronchoscope, the appearance of stridor and airway obstruction is possible, which often requires the hospitalization of these patients in the Intensive Care Unit, administration of 100% oxygen, analgesics, antibiotics, corticosteroids and nebulized adrenaline. Thus, a foreign body in the airways can be a major cause of morbidity and mortality in children. In order to reduce the incidence of foreign bodies in the airways of children, it is necessary to work on continuous education of their parents and guardians about the dangers of certain types of toys, foods and their environment.
Key words: foreign body in the airway, anesthesia, children.

MASSIVE PULMONARY THROMBOEMBOLISM: DIAGNOSTIC SIGNIFICANCE DANIEL ECG SCORE

E. Nikšić[1,2], D. Husović[1], S. Vučelj[2], Dž. Alić[2], O. Spahić[3], A. Habibović[4], E. Lukač Radončić[1]
1 EMERGENCY DEPARTMENT, HEALTH CENTER NOVI PAZAR, NOVI PAZAR, SERBIA [2] INTERNAL DEPARTMENT, GENERAL HOSPITAL NOVI PAZAR, NOVI PAZAR, SERBIA [,3] SURGERY, GENERAL HOSPITAL NOVI PAZAR, SERBIA [,4] RADIOLOGY, GENERAL HOSPITAL NOVI PAZAR, SERBIA

INTRODUCTION: Massive pulmonary thromboembolism (PTE) is an acute life-threatening condition. Early diagnosis is crucial, and the combination of ECG patterns and CT angiography allows for the timely identification of high-risk patients.
CASE REPORT: A 67-year-old patient presents with sudden onset dyspnoea, chest pain and weakness. Risk factors: recent leg trauma and immobilization. Dyspnoic, pale skin and mucous

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membranes. TA = 90/60 mmHg. ECG: sinus rhythm, sf 109/min., S1Q3T3, incomplete right branch block (iRBBB), inverted T to DIII, aVF, V1 – V5. Daniel ECG score 18 (> 10 indicates severe PTE). **RESULTS:** Laboratory findings: Troponin I 470 pg/mL, proBNP 11,749 pg/mL, D-dimer 20 mg/mL. Echocardiography (ECHO): right ventricle dilated with reduced function and hypokinesia of the middle third of the wall. Multislice computed tomography (MSCT) of the lungs: massive thromboembolism of the left main and lobar arteries. Color Doppler blood vessels of the lower extremities: incompressible V. poplitea right, finding consistent with phlebothrombosis. The patient was treated in accordance with modern PTE guidelines (category D1).
Daniel's ECG score > 10 helped eliminate the suspicion of myocardial infarction despite elevated troponin and accelerated the decision for MSCT angiography, confirming a massive PTE. Follow-up after one month (ECG, ECHO, MSCT) showed complete regression of changes and normalization of findings. It has been shown to be an effective tool for early identification of severe PTE in patients with nonspecific symptoms.
CONCLUSION: Daniel ECG score > 10 may be crucial in distinguishing massive PTE from acute coronary syndrome, while the combination of ECG, CT angiography, and vein ultrasound allows for a safe and accurate diagnosis.
Keywords: massive PTE, Daniel ECG score, CT angiography

TRAINING AND COMPETENCIES OF EMS NURSES AND EMTS

Igor Crnić, Eli Kafol
IZOLA HEALTH CENTRE, RESCUE SERVICE OF SLOVENIAN ISTRIA, IZOLA, SLOVENIA

BACKGROUND: Prehospital emergency medical services (EMS) across Europe operate within different historical, educational, legal, and professional frameworks. Models differ between physician based, nurse based, and paramedic based EMS models, particularly regarding the autonomy and scope of practice of EMS personnel working in ambulance services.
AIM AND METHODS: This analysis examines EMS organization and professional competencies in six European countries: Slovenia, Croatia, Austria, Germany, Italy, and Spain. It looks closely at educational backgrounds, legal regulations and workforce profiles. The comparative descriptive analysis was conducted by using publicly available legislation, professional regulations, educational frameworks, EMS organizational models, and published scientific and professional literature from the selected countries. It pays special attention to team composition, competency-based responsibilities, licensing requirements, and the legal boundaries of practice.
RESULTS: The way EMS is organized in Europe varies widely. Slovenia and Croatia primarily utilize nurse-based and physician supported EMS systems. In Slovenia, secondary school level healthcare technicians mainly work as emergency ambulance drivers and providers of non-emergency transport, while registered nurses (European Qualifications Framework – EQF 6 / bachelor level education) participate in emergency teams. Currently registered nurses possess relatively limited and inconsistently regulated autonomous prehospital competencies. Similar organizational characteristics are observed in Croatia, although EMS reforms have introduced greater standardization in form of the protocol driven autonomy and broader nursing participation in various procedures.
Austria and Germany in contrast rely predominantly on vocationally trained EMS professionals rather than nurses as the primary EMS workforce. Austria employs a tiered system consisting of Rettungssanitäter (basic EMTs) and Notfallsanitäter (advanced EMTs/paramedics), both requiring state recognized education and certification under national EMS legislation. Germany has one of the most advanced paramedic systems in Europe, where Notfallsanitäter complete a three-year

professional education program (EQF 5–6) with nationally regulated competencies that include advanced life support and give emergency medications independently before a doctor arrives.
Italy demonstrates considerable regional variability and lacks a nationally standardized protocols and directives that will change in the close future with the proposed "Riforma 118" legislation. EMS staffing actually still includes volunteer rescuers, nurses, and emergency physicians, with competencies differing significantly between regions and ambulance organizations. Spain combines vocationally educated EMS technicians (Técnico en Emergencias Sanitarias) with bachelor-level (EQF 6) nurses and physicians in advanced mobile emergency units.
Licensing and professional authorization systems also vary substantially. Germany and Austria have a clearly regulated EMS-specific certification and standards. Slovenia and Italy rely more heavily on employer based competencies and physician delegation / authorization.
CONCLUSION: European EMS systems demonstrate heterogeneity in education, professional regulation, licensing, and competency distribution among EMS personnel. Academically educated nurses and vocational paramedic models have clear differences when it comes to autonomy and legal authority. Higher academic education does not necessarily correlate with greater clinical autonomy in prehospital emergency care. The degree of professional independence correlates more strongly with specific legal regulation, protected professional authorization, and national EMS traditions than with EQF level alone. Understanding these differences is essential for international professional dialogue and potential harmonization of standards and legislative regulation within European EMS systems.
Keywords: prehospital emergency, ambulance service, education, licensing

ABDOMEN AND SHOCK - HOW TO REACH THE DIAGNOSIS ?

Anđela Pavlović, Suzana Ranđelović, Tatjana Lazarević, Dj. Stevanović
EMERGENCY CENTER, CLINIC OF CARDIOLOGY, UNIVERSITY MEDICAL CENTER KRAGUJEVAC, KRAGUJEVAC, SERBIA

INTRODUCTION: Abdominal pain accounts for approximately 7–10% of emergency department visits. Despite advances in diagnostic tools, undifferentiated abdominal pain remains the final diagnosis in a substantial proportion of patients, both among those discharged and those requiring hospital admission. Initial management and diagnostic urgency depend on the underlying cause, clinical presentation, and, most importantly, haemodynamic stability. Acute abdomen remains associated with 2-12% mortality, with figures increasing with every hour of definitive diagnosis and appropriate treatment delayed.
MATERIAL AND METHODS: Clinical scenarios of patients with shock of various etiologies who initially presented with abdominal pain were analyzed. Physicians must recognize high-risk features associated to worse outcomes, such as systemic inflammation, sepsis, or circulatory collapse. Therefore, rapid assessment, early resuscitation, timely laboratory work-up, bedside ultrasound, electrocardiography, and contrast-enhanced abdominal CT in haemodynamically suitable patients are essential components of the diagnostic approach.
RESULTS: This lecture will present several real-life clinical scenarios of shock of different aetiologies initially presenting with abdominal pain, including pneumoperitoneum, malignant bowel obstruction, ectopic pregnancy, myocardial infarction, and thrombotic disease.
CONCLUSION: Through these cases, practical algorithms for early recognition, initial stabilization, and targeted diagnostic work-up will be discussed, emphasizing that every hour of delay may significantly increase morbidity and mortality.
Key words: acute abdomen, shock, triage

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WHAT NOT TO MISS ON X-RAY IN ED

Dušica Ilić
UNIVERSITY CLINICAL CENTER NIŠ, RADIOLOGY DEPARTMENT

Classic radiography has been an indispensable tool in medicine for over a century and is a cornerstone in emergency medical imaging.
X ray imaging can be definite diagnostic tool for wide range of conditions, providing rapid and critical information in time-sensitive situations.
The aim is to identify life threatening conditions that should not be missed on X ray imaging by reviewing selected cases from everyday practice in our ED and ICUs.
This will include cases of chest, abdomen, spine and bones plain X ray images with medical emergencies such as pneumothorax, GI perforation, foreign bodies, misplaced tubes and lines and trauma cases.
Hoping that this will improve radiological diagnostic skills for X ray interpretation, especially in young ED physicians and encourage them in making life-saving decisions without delay.

TITLE: CROSS-BORDER EMERGENCY MEDICAL ASSISTANCE IN DISASTERS: INTERNATIONAL LEGAL STANDARDS AND CHALLENGES

Iva Pehlivanska
SECTORAL COUNCIL ON HEALTHCARE, EDUCATION AND POLICIES, MINISTRY OF EDUCATION AND SCIENCE, UNION OF PARAMEDICS IN BULGARIA, INTERNATIONAL AND HEALTH LAW, DEPT. ADMINISTRATIVE LAW AND PROCEDURE, SPECIALIZED HOSPITAL FOR REHABILITATION

BACKGROUND: Major disasters frequently exceed national medical capacities, requiring rapid deployment of Emergency Medical Teams (EMTs). The 2023 Turkey-Syria earthquakes (magnitude 7.8, February 6) killed over 55,000 people and highlighted critical systemic gaps: while massive international mobilization occurred, essential medical supplies and personnel faced three-day delays at border crossings, and over 50% of medical facilities in affected Syrian regions were dysfunctional. In such settings, legal and regulatory readiness becomes a determinant issue of clinical effectiveness, not a peripheral consideration, for disaster medicine specialists.
OBJECTIVES: (1) To evaluate WHO (World Health Organization) EMT classification and minimum standards; (2) To examine international legal instruments (IHR 2005, IDRL Guidelines) facilitating cross-border medical aid; and (3) To identify evidence-based strategies to overcome professional recognition and liability barriers.
METHODS: Comprehensive analysis of WHO EMT standards, the International Health Regulations (2005), and the IFRC International Disaster Response Law (IDRL) Guidelines, supported by case analysis of the 2023 Turkey-Syria earthquake response examining deployment of over 300 international medical teams and cross-border coordination mechanisms.
RESULTS: WHO EMT Standards: The classification into Types 1, 2, and 3 ensures interoperability and standardized clinical capacity. A vital but often overlooked standard is the mandatory integration of early rehabilitation (minimum 1 rehabilitation professional per 20 beds for Type 2/3 teams), which is essential to prevent long-term disability in trauma victims.
LEGAL FRAMEWORKS: While the IHR (2005) mandates state cooperation for public health emergencies, the EU Civil Protection Mechanism provides a superior operational model through 24/7 Emergency Response Coordination Centre and mutual recognition of medical credentials. However, global "legal corridors" for expedited cross-border medical response remain underdeveloped.

OPERATIONAL CHALLENGES: Key barriers include lack of harmonized professional qualification recognition across borders, liability and malpractice insurance gaps for foreign medical responders, and complex customs procedures delaying essential equipment. The Bab al-Hawa border crossing case demonstrates how political obstacles can critically obstruct medical neutrality and timely access to affected populations.
CONCLUSIONS: Effective disaster medical response requires transition from ad hoc mobilization to pre-positioned legal readiness. Evidence-based recommendations include:
Universal Verification: All international medical teams should meet WHO EMT standards to ensure quality assurance and clinical safety.
Legal Preparedness: Development of pre-disaster bilateral agreements explicitly including expedited professional licensing and liability protection for all team members, including rehabilitation specialists.
Digital Continuity: Standardizing cross-border electronic patient record transfers to ensure continuity of care and medical documentation.
Protected Neutrality: Establishing humanitarian corridors protected from geopolitical influence through international legal mechanisms.
Clinical Relevance: Understanding these legal and operational frameworks enables emergency medicine professionals to deploy more effectively, minimize life-threatening regulatory delays, and ensure the highest standards of patient care in disaster environments.
Keywords: disaster medicine; Emergency Medical Teams (EMT); WHO EMT standards; cross-border medical response; trauma care; surgical capacity in disasters; early rehabilitation; international disaster response; regulatory barriers; deployment readiness

SEPTIC SHOCK CAUSED BY MEDIASTINITIS

Marija Stošić[1,2], Vesna Marjanović[2,3]
[1]CLINIC FOR CARDIAC SURGERY, UNIVERSITY CLINICAL CENTER NIŠ, SERBIA, [2] FACULTY OF MEDICINE, UNIVERSITY OF NIŠ, SERBIA, [3] CLINIC FOR ANESTHESIA AND INTENSIVE CARE, UNIVERSITY CLINICAL CENTER NIŠ, SERBIA

Poststernotomy mediastinitis is one of the most severe complications following cardiac surgery and represents a significant cause of postoperative morbidity and mortality. Due to the close proximity of the heart and great vessels, a localized infection can rapidly progress to a systemic inflammatory response, bacteremia, and septic shock. Although its incidence is relatively low, the clinical course is often dramatic, requiring prolonged treatment, multiple surgical interventions, and carrying a high mortality rate.
The aim of this paper is to emphasize the importance of early recognition and a multidisciplinary approach in the diagnosis and treatment of septic shock caused by mediastinitis after cardiac surgery. Special attention is focused on risk factors, clinical manifestations, and contemporary therapeutic strategies.
Clinical presentation may be nonspecific, particularly in elderly, immunocompromised, and sedated patients, in whom fever may be absent. Signs such as sternal pain and instability, wound dehiscence, purulent discharge, hypotension, elevated serum lactate, oliguria, and altered mental status may indicate progression of infection and the development of septic shock. Risk factors include diabetes mellitus, obesity, chronic obstructive pulmonary disease, renal insufficiency, malnutrition, prolonged mechanical ventilation, and more complex surgical procedures.
Management requires prompt administration of broad-spectrum antibiotics, hemodynamic stabilization, source control through surgical debridement and sternal reconstruction, as well as

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intensive monitoring of vital functions. Early diagnosis and an aggressive therapeutic approach significantly improve clinical outcomes and reduce mortality.

Keywords: poststernotomy mediastinitis, septic shock, cardiac surgery, sepsis, sternotomy, wound infection.

FIRST PRIVATE EMERGENCY DEPARTMENT IN BOSNIA AND HERZEGOVINA

Amela Ramadani Podžo, Aida Gavranović
EMERGENCY DEPARTMENT OF ASA HOSPITAL, SARAJEVO, BOSNIA AND HERZEGOVINA

Two years ago, with the establishment of the first private general hospital in Bosnia and Herzegovina, the first private emergency department also began operating. Considering the introduction of secondary level private healthcare into a healthcare system that had until then been exclusively public, expectations were both enthusiastic and uncertain.

Among the first departments to start operating on April 6, 2024, symbolically on the Day of the City of Sarajevo, is also the Emergency department of ASA Hospital.

Spanning 36,000 m², the hospital features 180 hospital beds across seven floors, 10 operating rooms, 20 outpatient clinics, and a committed team of 290 employees.

The emergency department operates 24 hours a day, 7 days a week, providing fast and professional care for acute health conditions, injuries, acute exacerbations of underlying diseases, and life-threatening conditions.

The emergency department is equipped with a special emergency operating room, as well as comprehensive radiological and laboratory diagnostics.

Our experienced team of specialists, nurses and technicians, with a deep understanding of emergency situations and a wide range of medical skills, are dedicated to providing the best possible intervention and saving lives.

If we are unable to offer further treatment because the condition requires a tertiary level of health care, we will facilitate the transport of the patient through the ambulance service to the nearest tertiary health facility.

Key words: private emergency department, private hospital

SPLEEN INJURIES – TRAUMA FOR THE DOCTOR

Miodrag Đorđević
UNIVERZITETSKI KLINIČKI CENTAR NIŠ, KLINIKA ZA ENDOKRINU HIRURGIJU

Spleen injuries are a significant clinical problem within abdominal trauma, with potentially serious consequences for the patient's life. As a highly vascularized organ located in the upper left quadrant of the abdomen, the spleen is particularly susceptible to injuries due to blunt trauma, such as car accidents, falls, and penetrating injuries. There are various approaches and procedures in the diagnosis and treatment of spleen injuries, and special attention should be paid to assessing the severity of the injury and choosing the optimal therapeutic strategy. Diagnostics is based on clinical examination and the application of modern radiological methods, among which computed tomography plays a key role in the classification of injuries and making therapeutic decisions. In recent decades, there have been more and more frequent decisions about non-surgical treatment of hemodynamically stable patients, which seeks to preserve the immune function of the spleen. However, surgical treatment, including splenectomy, continues to play an important role in severe

injuries and unstable patients. Special attention in clinical practice should be paid to indications for surgical intervention, possible complications, as well as the importance of postoperative protection against infections.

Keywords: spleen, injury, abdomen, surgery

THE IMPACT OF AN ACCESS BLOCK ON THE PATIENT'S TOTAL TIME IN THE EMERGENCY ROOM

Marija Marinković
UNIVERSITY CLINICAL CENTER NIŠ, EMERGENCY CENTER "PRIM DR MIODRAG LAZIĆ-LAZA"

An access block is the inability to admit patients from the emergency center (UC) to the appropriate hospital ward for an optimal period of time, most often defined as a delay of more than 8 hours from the decision on hospitalization. This phenomenon is one of the key causes of overload in emergency rooms around the world and directly affects the total time patients spend in the UC, the quality of care, and patient safety. Modern research shows that access block is not just an organizational problem, but a systemic disorder that affects all phases of emergency care – from triage, through diagnostics, to the final outcome.

The prolonged retention of patients in the UC due to the lack of free hospital beds leads to a number of negative consequences. First, the total time of stay of patients (ED Length of Stay – ED LOS) increases, which slows down the flow and creates a "bottleneck" in the reception zone. Patients waiting for admission occupy space, equipment and staff, reducing the capacity of the UC to accommodate new emergencies. Second, prolonged stay at UC is associated with an increased risk of adverse events, including deterioration of clinical condition, infections, delayed therapy, and mortality.

An access block also affects the time until the first medical intervention. When UC capacities are burdened with patients waiting for admission, triage and initial treatment of new patients slow down. Studies show that waiting times in triage and time to doctor's appointment are significantly extended during periods of high access block. This particularly affects medium and low priority patients, but also vitally vulnerable patients may be subject to delays due to lack of space and staff.

In organizational terms, an access block leads to an increased burden on healthcare workers, burnout, reduced efficiency, and a higher risk of errors. UC staff is forced to simultaneously care for patients waiting for admission and new emergencies, which creates chronic overload and impairs the quality of communication with patients. In addition, prolonged patient stays in UC increase costs for the health system and reduce the availability of emergency services.

Solutions to reduce access blocks include systemic and local interventions. At the hospital level, key measures are increasing the number of available beds, optimizing discharges, moving patients from ward to ward faster and introducing a "flow manager". At the UC level, effective strategies include rapid diagnosis, expedited hospitalization protocols, the creation of special zones for patients waiting for admission, and better coordination with departments. In countries with developed emergency systems, the implementation of the "wholehospital approach" model has shown a significant reduction in access blocks and total patient stay time.

In conclusion, access block is one of the most important factors affecting the total time patients spend in the emergency room. Solving it requires a multidisciplinary approach, clear protocols and active cooperation of all hospital services. Reducing access blocks directly improves patient flow, quality of care and safety, and is a priority of modern emergency medicine.

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ACUTE EPIGLOTTITIS - AN URGENT AND POTENTIALLY FATAL CONDITION

Nikola Nikolić
UNIVERSITY CLINICAL CENTER NIŠ, CLINIC FOR THE EAR, NOSE AND THROAT

Acute epiglottitis is an urgent condition that, if not diagnosed or treated on time, can be life-threatening. Various etiological factors have been described, and bacteria are the main causative agent. Until the introduction of the vaccine, Haemophilus influenzae was the most common cause of acute epiglottitis. The clinical features can be dramatic and without a prodromal phase. Typical symptoms such as hypersalivation, difficulty breathing, anxiety, inability to take food, tripod position, are similar in children and adults, with the difference that they are more pronounced in the pediatric age. The diagnosis is established by anamnesis, clinical picture and, if the patient's condition allows, flexible nasolaringoscopy, which is the gold standard. Securing the airway is a major therapeutic challenge. There is still debate in the literature about how to manage the airway, from watchful waiting to early, prophylactic intubation, or tracheotomy. Tracheotomy and intubation as well are usually performed by experienced anesthesiologists and otorhinolaryngologists and should be performed under controlled clinical conditions. Medical therapy includes the use of third-generation cephalosporins, or in case of allergy, quinolones and vancomycin. Although corticosteroids are given in most of the cases, their use remains controversial. It has been shown that they have no effect on the reduction of symptoms nor the length of hospitalization.

POSTOPERATIVE MENINGOENCEPHALITIS IN A PATIENT WITH A CHRONIC PILONIDAL SINUS

Slađana Trpković [1,2]
[1]FACULTY OF MEDICINE PRIŠTINA, UNIVERSITY OF PRIŠTINA – KOSOVSKA MITROVICA,
[2]UNIVERSITY CLINICAL CENTER PRIŠTINA, LOCATED IN GRAČANICA

INTRODUCTION: Post-spinal bacterial meningoencephalitis is a rare but potentially life-threatening complication of neuraxial anesthesia. The clinical presentation develops rapidly, sometimes within the first few hours after intrathecal administration of anesthetic agents.
CASE REPORT: A 19-year-old male patient, without comorbidities and with normal laboratory parameters, was admitted to the Department of Surgery of the Clinical Centre of Priština–Gračanica for surgical treatment of a recurrent pilonidal sinus. Six hours after the administration of spinal anaesthesia, a sudden deterioration of the clinical condition occurred, manifested by vomiting, delirium with hallucinations, psychomotor agitation, and episodes of aggressive behaviours, accompanied by complete disorientation (in time, place, and person). Due to the inability to perform necessary diagnostic procedures, the patient was urgently transferred to the University Clinical Centre Niš. Upon admission to the intensive care unit, bacterial meningoencephalitis was suspected (altered level of consciousness, leucocytosis, elevated C-reactive protein, procalcitonin, and presepsin), and a lumbar puncture was performed. Cerebrospinal fluid (CSF) analysis revealed neutrophilic pleocytosis and elevated protein levels, with normal glucose concentration. However, although clinical and laboratory findings were suggestive of bacterial meningitis, CSF cultures remained negative, most likely due to early initiation of antibiotic therapy. Blood culture and wound swab yielded Staphylococcus epidermidis, suggesting that possible mechanisms of meningitis in this case include direct inoculation during spinal anaesthesia and hematogenous spread in the setting of possible bacteraemia. During the stay in the intensive care unit, the patient required mechanical ventilation,

followed by oxygen therapy via mask. After 12 days of hospitalization, he was discharged in good general condition.

CONCLUSION: Early recognition, timely empirical antibiotic therapy, and urgent transfer to a tertiary healthcare facility were crucial for a favourable outcome. This case highlights the importance of strict adherence to aseptic technique during neuraxial procedures, as well as the fact that negative cerebrospinal fluid cultures do not exclude the diagnosis of bacterial meningitis.

Keywords: spinal anaesthesia, bacterial meningitis, pilonidal sinus, iatrogenic infection, asepsis

WHEN ALCOHOL MASKS DANGER – A CASE REPORT OF SUBDURAL HEMATOMA

Milan Urošević
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

An EMS team brought a 45-year-old man to the emergency center, found on the street in a state of severe alcohol intoxication. According to the HMP team, after leaving the restaurant, he fell, after which he returned, then lay down on an armchair in the restaurant, after which the restaurant staff invited the HMPi team

An objective examination revealed the following: the patient was somnolentic, severe ethyl halitus, indistinct, easily aggressive and without the possibility of cooperation. No visible injuries to the head except for a minor scratch on the forehead. He threw up once during the examination.

Vital parameters: TA 135/85 mmHg, ECG: sinus, normogram, sf 110/min, no ST and t disorders, SpO_2 95%. Neurological: somnolentic, dysarthritic, pupil isocortic, slow reaction with light. GMS without clear lateralization, meningeal signs negative, GCS 12 (O3 V4 M5).

Due to alcohol intoxication and the absence of clear neurological outbursts, the patient was kept for further observation with rehydration, symptomopathic therapy and monitoring. A urinary catheter is placed.

Over the next three hours**, there was no awakening**. The new vital parameters did not show a significant deviation from the original ones, except for mild tachypnea, but a change in the state of consciousness was evident in the neurological status (somnolence deepened, the patient periodically showed motor restlessness accompanied by brief episodes of rigidity of the extremities. Speech is worse, the finding on the pupils is significantly different – the right is slightly wider and slower reactive). GCS dropped to 9 (O2 V2 M5).

Due to the deterioration of the condition, an emergency **MSCT of the endocranium** was performed, which showed **a right-sided subdural hematoma** 12 mm thick, with a slight displacement of the midline and a compressive effect. Transport to NHK UKC Niš was indicated, where the patient underwent surgery and after 15 days was returned to the home institution for further treatment

This case shows how much alcohol can **mask symptoms and make it difficult to make a timely diagnosis, in this case a serious head injury**. The elements that masked the whole situation are an acutely drunken state, the fact that the patient returned to the restaurant after the fall, the absence of external injuries. The key moments that enabled a favorable outcome were continuous monitoring of the level of consciousness, recognition of deviations from the expected course of alcohol intoxication, timely neurological reevaluation, and urgent referral to MSCT.

The case emphasizes that any patient with alcohol intoxication and a history of fall must be viewed as potentially neurotraumatized, until a serious injury is ruled out by adequate diagnosis.

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POPLITEAL ARTERY ANEURYSM

D. Husović, E. Nikšić, E. Lukač Radončić
HEALTH CENTER NOVI PAZAR, EMERGENCY MEDICAL SERVICE

INTRODUCTION: A popliteal artery aneurysm is an enlargement of the main occipital artery – the popliteal artery, which occurs due to the weakening of its wall. The condition can be urgent because it leads to blood clots, reduced blood flow to the lower leg and foot, and even rupture and loss of a limb if left untreated. Early diagnosis using ultrasound and CT angiography are the gold standard in making a diagnosis.
CASE REPORT: A 48-year-old patient reports to the emergency room due to sudden pain and cramps in the lower leg of his left leg. He denies trauma as a possible cause, and states that his father underwent surgery for an enlarged blood vessel at a similar age.
RESULTS: On examination, conscious, oriented, left lower leg livid, palpation of the knee pulsating a. poplitea. The pulse of a. Dorsalis pedis and a.Retromaleolaris do not palpate. Echosonographic color duplex scan: visualizations are made of an aneurysmatically enlarged left a.Poplitea 35 mm in diameter and 47 mm in length with a 13 mm thick thrombus present. The patient is referred to the UKCS, Clinic for Vascular and Endovascular Surgery, where the diagnosis is confirmed by MSCT angiography.
DISCUSSION: Pain in the lower leg without anamnestic information about trauma with physical examination and positive genetics, are sufficient suspicion of vascular etiology. By replacing the popliteal aneurysm with a venous graft: Extirpatio aneurysmatis a. poplitealis lateris sinistri "in loto" et interpositio grafti autovenosum "reverse", the patient was definitely taken care of and discharged home with adequate antiplatelet therapy.
CONCLUSION: A popliteal artery aneurysm is a serious condition that can endanger the leg and the patient's life. Early diagnosis by ultrasound and timely surgery significantly improve the prognosis
Keywords: Popliteal artery, Aneurysm, Thrombosis, ultrasound, CT angiography

NEW GUIDELINES IN CARDIOPULMONARY RESUSCITATION

Aleksandar Pavlović[1,2]
[1]FACULTY OF MEDICINE PRIŠTINA, UNIVERSITY OF PRIŠTINA – KOSOVSKA MITROVICA, [2]UNIVERSITY CLINICAL CENTER PRIŠTINA, LOCATED IN GRAČANICA

The European Resuscitation Council (ERC) has published new guidelines for the period 2025–2030, based on the recommendations of the International Liaison Committee on Resuscitation (ILCOR), aiming to improve the recognition of cardiac arrest, the quality of cardiopulmonary resuscitation (CPR), and post-resuscitation care.
Although the new recommendations do not introduce radical changes compared with the 2021 guidelines, they strongly emphasize the importance of early recognition of cardiac arrest, timely activation of emergency medical services (EMS), and the initiation of high-quality chest compressions. Particular attention has been given to the concept of the “Formula for Survival,” which integrates science, education, and implementation. Epidemiological data indicate that the annual incidence of out-of-hospital cardiac arrest (OHCA) in Europe is approximately 55 per 100,000 inhabitants, with an overall survival rate of only 7.5%, whereas outcomes of in-hospital cardiac arrest (IHCA) are significantly better due to earlier recognition and the availability of advanced treatment modalities. Within the framework of Basic Life Support (BLS), the 2025 guidelines emphasize that any unresponsive person should immediately be considered a potential cardiac arrest victim, prompting

the immediate initiation of CPR and activation of EMS. Assessment of breathing by inexperienced rescuers should be assisted by EMS dispatchers. Recognition of agonal breathing and brief seizure-like activity has gained particular importance, as these manifestations frequently delay the initiation of CPR. The guidelines also stress minimizing interruptions in chest compressions, maintaining a compression rate of 100–120/min with a depth of 5–6 cm, and ensuring the earliest possible use of an automated external defibrillator (AED). Although "head-up CPR" has shown promising results, it has not yet been incorporated into the official CPR guidelines. Advanced Life Support (ALS) includes modern approaches to airway management, ventilation, defibrillation, and drug administration during resuscitation. A stepwise airway management strategy is recommended, with supraglottic airway devices and tracheal intubation used according to the rescuer's expertise and the clinical situation. Bag-mask ventilation during CPR does not reduce the likelihood of return of spontaneous circulation (ROSC), although post-resuscitation airway management should include endotracheal intubation. Epinephrine remains the vasopressor of choice, while amiodarone is the preferred antiarrhythmic agent; lidocaine may be used according to local protocols. Defibrillation is now recommended even in cases of fine ventricular fibrillation, representing an important novelty in the updated guidelines. In well-monitored settings, CPR should be initiated when arterial blood pressure decreases below 50 mmHg. In such circumstances, epinephrine should initially be administered in titrated low doses of 50–100 μg rather than the standard 1 mg bolus dose. A "three-shock strategy" is recommended in these highly monitored environments, whereas single-shock strategies remain standard in other settings. Following each defibrillation attempt, chest compressions should be continued for 2 minutes (five CPR cycles) before reassessment of cardiac rhythm. Sodium bicarbonate administration is indicated only in cases of metabolic acidosis, while persistent respiratory acidosis during the first minutes of CPR should be corrected through adequate ventilation. During CPR, the highest possible oxygen concentration (100%) should be administered, whereas during ROSC oxygen therapy should be titrated to maintain arterial oxygen saturation (SaO_2) between 92–94% and arterial oxygen tension (PaO_2) between 75–100 mmHg. Target Temperature Management (TTM) remains an important component of post-cardiac arrest care; however, the focus is no longer on routine deep hypothermia (33°C) for all patients, but rather on active temperature control and prevention of fever, maintaining a target temperature ≤37.5°C. Post-resuscitation care frequently requires a multidisciplinary approach with maintenance of normoxemia, normocapnia, and mean arterial pressure >65 mmHg under continuous monitoring in the intensive care unit.

SCAD AS A HIDDEN CAUSE OF *MINOCA* - THE IMPORTANCE OF INTRACORONARY IMAGING

Bane Spasović[1], Bojan Maričić[1,2], Svetlana Apostolović[1,2]
[1] CLINIC OF CARDIOLOGY, UNIVERSITY CLINICAL CENTER NIŠ, [2] FACULTY OF MEDICINE, UNIVERSITY OF NIŠ

The clinical syndrome *MINOCA* (*Myocardial Infarction with Non-Obstructive Coronary Arteries*) is defined by the presence of criteria for acute myocardial infarction, with angiographic findings without significant coronary stenosis (≤50%) and without another apparent cause explaining the clinical picture. The diagnosis is most often made immediately after coronary angiography in patients with a clinical picture consistent with acute myocardial infarction. It is important to note that *MINOCA* is a working diagnosis that requires further evaluation. An additional challenge is the fact that modern criteria for myocardial infarction are predominantly based on troponin, the increase of which may be present in other clinical conditions.

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We present a case of a 55-year-old patient with sudden onset of pain in the middle of the chest for 2 hours. The electrocardiogram showed ST-elevation in the V3–V5 drains, while an increase in high-sensitivity troponin I (hsTnI - 0.08 ng/mL at admission, reference <0.04 ng/mL) was recorded, which confirmed the diagnosis of *ST-elevation myocardial infarction (STEMI*), and referred for urgent invasive diagnostics. An orientation transthoracic echocardiogram showed preserved global left ventricular systolic function (EF - 55%), with hypokinesia of the anteroseptal segments, without signs of apical balloonization and pericardial effusion, with preserved right ventricular function.
Coronary angiography did not clearly identify *a culprit* lesion, but angiography suspicion of spontaneous dissection of the left *anterior descending branch of the left coronary artery (LAD*). The left ventriculography was normal, with no regional kinetic disorders.
After coronary angiography, intravascular ultrasound (*IVUS)* of the coronary arteries was performed, which revealed the dissection of the *LAD* wall with intramural hematoma, which confirmed the diagnosis of *Spontaneous Coronary Artery Dissection (SCAD*).
In the meantime, the result of D-dimer arrived, which was negative.
Differential diagnosis of *MINOCA* includes coronary causes (rupture or erosion of plaque, vasospasm, spontaneous coronary artery dissection, thromboembolization and microvascular dysfunction), non-coronary cardiac causes (myocarditis and takotsubo cardiomyopathy), as well as extracardiac causes of troponin elevation (pulmonary embolism, sepsis, and conditions with an imbalance between the need and supply of oxygen to the myocardium). In this case, a negative D-dimer made pulmonary embolism unlikely, while a normal ventricular finding reduced the likelihood of takotsubo cardiomyopathy. Identification of LAD dissection using *the IVUS method* made it possible to make a definitive diagnosis of the coronary cause *of MINOCA* syndrome.
Based on the clinical picture, laboratory and invasive findings, the diagnosis of *MINOCA was made,* which is based on *SCAD – LAD* arteries. After diagnosis, anticoagulant therapy was discontinued and antiplatelet therapy was reduced by discontinuation of one antiplatelet drug.
Follow-up coronary angiography after a month showed a completely normal angiographic finding, with no signs of residual dissection or stenosis.
The diagnostic approach of *MINOCA* syndrome requires systematic evaluation, including intracoronary imaging (*IVUS*/*OCT*), whereby *IVUS* plays a significant role in the identification of intramural hematoma and vascular wall dissection in suspected SCAD. Therapy depends on the underlying mechanism, while in the absence of a clearly defined cause, secondary prevention is recommended.
This case illustrates the importance of intracoronary imaging in confirming the diagnosis and clarifying the etiology in *MINOCA*, especially in the context *of STEMI* presentation without angiographically evident lesion, as well as the typical course of spontaneous *resolution of SCAD* lesions.
Keywords: *MINOCA; SCAD*; *IVUS; STEMI;* intracoronary imaging.

A CASE REPORT OF SUCCESSFUL RESUSCITATION IN A HEALTH CENTER, WITH THE USE OF AED

Ivana Andrić
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

During the morning shift at the Health Center, a 48-year-old man suddenly collapsed in front of the elevator. It turned out to be a doctor at home. The collapse was noticed by two women standing nearby and called emergency medical staff, which is located about 10m from the elevator.

Initially, the patient is unconscious, without breathing or pulse. A medical technician immediately began cardiopulmonary resuscitation (BLS), while another member of the team brought an automatic external defibrillator (AED), which was part of the health center's equipment and was obtained from a donation a few days earlier. After the placement of the AED electrodes, the device performed a rhythm analysis and ordered the continuation of resuscitation procedures.
Resuscitation was continued with chest compressions in accordance with asystole guidelines. The airway is secured with an iGel mask. After two minutes, the AED analyzed the rhythm again and recommended defibrillation again. A second shock was delivered, after which there was a return of spontaneous circulation (ROSC). The patient began to breathe shallowly and spontaneously, and soon a weak but present pulse was established. The team provided oxygen support, set up an intravenous pathway, and prepared the patient for transport.
In the emergency reception service, the patient has experienced another episode of cardiac arrest that has been resolved by emergency defibrillation (using a manual defibrillator, since this service does not have an AED) After this, the patient is referred to the cardiology department, where he undergoes an emergency diagnosis, which confirmed an acute myocardial infarction with occlusion of the anterior descending artery. After successful percutaneous coronary intervention (pPCI), the patient was stabilized and transferred to the intensive care unit. Over the next few days, the recovery proceeded smoothly, without significant neurological consequences, thanks to the quick and properly conducted resuscitation.
This case clearly shows how crucial the presence of an AED device in the health center, as well as trained staff, is for the survival of patients with sudden cardiac arrest. An AED allows for quick and easy defibrillation even in situations where there is no immediately available doctor, and the combination of high-quality compressions and timely defibrillation significantly increases the chances of a favorable outcome.
The case confirms the importance of continuous education of staff, the availability of AED devices in all healthcare facilities and the implementation of standardized resuscitation protocols. It is thanks to these factors that resuscitation in the health center ended successfully, with a complete recovery of the patient.

INTENSIVE CARE OF PATIENTS IN EMERGENCY MEDICINE WITH CASE REPORT

Dževad Velagić
CANTONAL HOSPITAL ZENICA, BOSNIA AND HERZEGOVINA

INTRODUCTION: Intensive care is a branch of medicine specialized in providing continuous monitoring, care and assistance to a life-threatening patient and is crucial in treatment. A critical condition, then it is necessary to begin treatment, intensive care treatment conducted by an emergency medicine specialist. The prevalence of critical conditions begins with the SHMP staff, no further treatment is necessarily required. More severe conditions are treated in emergency medicine, hospitals, after which patients are discharged or referred to the central ICU.
BACKGROUND: Peter Safer indicated that the chances of survival and organ recovery in intensive care significantly increase if resuscitation measures are started from the moment a critical patient is recognized.
The path of the critically ill patient from SHMP, emergency medicine, hospital and operating room complications, post-operative recovery in central intensive care units.

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Gainski and colleagues concluded that critically ill patients treated by SHMP from the beginning have better outcomes in intensive care units.
Anesthesiologist Bjorn Ibsen was the first to establish an intensive care unit in 1953., in the 1970s, the development of intensive care experienced a significant development.
Emergency care: Emergency intensive care interventions begin with airway management, CPR, defibrillation, pacing, and chest tube cardioversion.
Early initiation of intensive care treatment in critically ill patients can halt or reverse acute organ dysfunction and improve short- and long-term survival.
MANAGEMENT: Based on expert conclusions, WHO concluded that emergency medicine and intensive care in the initial state saves money and provides the most needed assistance to the patient. The emergency medicine department has teams for coronary diseases, emergency interventions, resuscitation and intensive care.
The basic tasks of intensive care, monitoring parameters, patient, respiratory support, hemodynamic stability, solving acute problems, multidisciplinary approach to all conditions in the body,
Prof. Dr. Tintinalli in the literature from 2020 describes the technique of endovascular balloon occlusion of the aorta in rescue in severe injuries, a presented technique that emerged after summarizing the knowledge and techniques that were implemented in the field in Afghanistan during rescue and intensive treatment of the injured.
Initial intensive care treatment in emergency medicine departments gives us the space and possibility of carrying out diagnostics and tests with which we will reach a definitive diagnosis.
CONCLUSION: In 2025, a college of doctors in Europe deliberated, debated and advised, and came to the realization and common opinion that the ideal path for a severely endangered patient is as follows: early recognition, followed by the first medical response, if emergency medicine treatment with intensive care did not help, if it did not result in homeostasis, the patient is referred to a central intensive care unit, which continues with general care that leads to the patient's recovery, the patient is discharged and further recovery is carried out through rehabilitation, which is considered to be complete. Critical care journal; an article that shows similar thoughts of doctors who care for seriously ill patients in intensive care.

PATIENT EDUCATION IN THE EMERGENCY CENTER – ROLE, CHALLENGES AND STRATEGIES

Marijana Đorđević
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

Educating patients in the emergency room is often seen as a side obligation in an environment dominated by speed, noise, stress and a constant struggle against time. However, modern emergency medicine is increasingly showing that the quality of communication is one of the most powerful clinical tools. A patient who understands what is happening to him, what to do at home and when to seek help again is safer, more satisfied and less likely to return to the emergency room unnecessarily. WHO data that 40–60% of patients do not understand the instructions they receive during an urgent examination only confirms how important this segment is.
In such an environment, education becomes a kind of "silent intervention". As the dynamics of emergency care unfold around the patient, a short, clear, and focused explanation can make the difference between a successful recovery and a return return. Studies show that a well-explained diagnosis and treatment plan reduce return visits by 20–30%. Patients who understand the treatment are less likely to make mistakes in the dosage, and those who know the signs of worsening react more

quickly when it is really needed. The American College of Emergency Physicians calls education "the pillar of quality emergency care."

The specificity of the emergency center requires that the education be short, simple and focused on the essence. Patients are often in pain, stressed, scared or confused. Health literacy is often low and time is limited. That is why the information must be reduced to the most important things: what the diagnosis is, what to do at home, how to take therapy and when to contact again. In practice, this means avoiding technical terms, using short sentences, and checking understanding through the "teachback" method, where the patient repeats instructions in their own words.

The most critical areas of education include understanding diagnosis, proper use of medications, recognizing signs of worsening, and basic principles of prevention. It is especially important to explain what is normal to expect after an examination and therapy, and what is an alarm. In chronic diseases – hypertension, asthma, COPD, diabetes – even short education can have a long-term effect on disease control.

Training methods must be adapted to the pace of the emergency room. Verbal explanations are the most common, but written materials – short brochures, clear discharge certificates, pictograms – significantly increase understanding. Research shows that patients remember only about 20% of verbal information, but more than 60% when they receive written material. Visual education is especially helpful for patients with low health literacy.

Of course, there are obstacles: lack of time, staff overload, noise, emotional state of patients, language barriers. However, the literature clearly shows that even short, well-structured education can have a powerful effect. Standardized protocols, simple written materials, mandatory explanation of therapy and signs of deterioration, as well as the involvement of nurses in the education process – are realistic and feasible steps of improvement.

In the end, patient education in the emergency room is not an add-on, but an integral part of quality emergency medicine. It makes care complete, increases safety and trust, reduces the burden on the system and gives the patient what he needs most at that moment – clarity, security and the feeling that he is really cared for.

FATIGUE AS THE FIRST SIGN OF MULTIPLE MYELOMA – A DIAGNOSTIC CHALLENGE IN THE EMERGENCY DEPARTMENT: A CASE REPORT

Zehrina Husnić, Belma Bušatlić, Elma Demirović
DEPARTMENT OF EMERGENCY MEDICINE WITH OBSERVATION UNIT, GENERAL HOSPITAL "PRIM. DR. ABDULAH NAKAŠ" SARAJEVO, BOSNIA AND HERZEGOVINA

Fatigue is a common but nonspecific symptom that is often attributed to benign or chronic conditions in everyday clinical practice, which may delay the diagnosis of serious diseases. We present a case of a patient in whom isolated fatigue was the sole initial manifestation of multiple myeloma. A 68-year-old male was admitted to the emergency department due to progressive fatigue lasting four months, without pain, fever, or weight loss. Physical examination revealed marked pallor, while laboratory findings demonstrated severe pancytopenia (erythrocytes 1.81×10^{12}/L, hemoglobin 58 g/L, platelets 100×10^{9}/L), along with renal insufficiency and hypercalcemia. Despite multiple blood transfusions, there was no expected increase in hemoglobin levels, representing a key diagnostic red flag prompting further evaluation. Additional analyses confirmed elevated immunoglobulin A (IgA) levels and the presence of Bence Jones protein, while the diagnosis of multiple myeloma was definitively established by bone marrow biopsy. Standard treatment with bortezomib, cyclophosphamide, and dexamethasone, along with bisphosphonates, was initiated. This case highlights the importance of a

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multidisciplinary approach, with the role of the emergency physician being crucial in the early recognition of nonspecific symptoms and timely referral for further management. Persistent fatigue in combination with pancytopenia and lack of response to transfusion requires urgent hematological evaluation. Early recognition of these "red flags" can significantly shorten the time to diagnosis and initiation of appropriate treatment.

Keywords: fatigue, emergency medicine, multiple myeloma, pancytopenia, transfusion

SIMULATION-BASED LEARNING (SBL)

Dumitru Șutoi
UNIVERSITY OF MEDICINE AND PHARMACY „VICTOR BABEȘ", TIMIȘOARA, ROMANIA

Simulation-Based Learning (SBL) has emerged as a cornerstone in modern medical education, offering a highly effective and safe environment for the development of clinical competencies, particularly in Emergency Medicine. By integrating realistic clinical scenarios with advanced technology, SBL allows trainees to practice critical decision-making, procedural skills, Team-work, and communication without risking patient safety. This approach is especially valuable in high-stakes, time-sensitive specialties such as Emergency Medicine, where rapid and accurate interventions are essential. SBL promotes experiential learning, enhances retention of knowledge, and bridges the gap between theoretical understanding and real-life clinical practice. It also facilitates structured feedback and reflective learning, contributing to continuous professional development. Despite its proven benefits, the adoption of simulation-based methodologies remains uneven across different regions.

The Balkan region—including countries such as Romania, Serbia, and Bulgaria—stands to gain significantly from broader implementation and dissemination of SBL. Increased investment in simulation infrastructure, faculty training, and curriculum integration could substantially improve the quality of medical education and patient outcomes. Emphasizing SBL as a strategic educational tool can support the development of highly competent Emergency Medicine physicians, ultimately strengthening healthcare systems across the region.

CHALLENGES OF NIGHT SHIFT IN THE EMERGENCY CENTER – ORGANIZATIONAL, CLINICAL AND PSYCHOLOGICAL ASPECTS

Milica Jovanović
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

The night shift in the emergency center carries a special weight – it is a combination of the silence of the sleeping city and the intensity of medical situations that do not choose the time. While the corridors seem calmer than during the day, behind this apparent silence there is a work environment that is at once unpredictable, demanding and emotionally draining. The literature in the field of emergency medicine clearly shows that the night brings specific challenges that affect both patients and healthcare professionals.

Over the course of the day, the patient's profile changes. People with trauma, alcohol intoxication, psychiatric crises and acute pain syndromes are more likely to arrive at the emergency center. Communication is difficult – alcohol, aggression, confusion and fear create additional barriers. In many areas, including Serbia, night is also the time when patients with non-urgent problems seek help because primary health care is not available. All this increases the pressure on staff, and studies show that the number of incidents of violence in the night shift increases by up to 50%.

At the same time, night work almost always means working with reduced resources. Fewer doctors, nurses and technicians have to respond to the same complex situations as they do during the day. Diagnostics are available, but with minimal teams, so patient processing time is extended. ACEP states that at night, optimal staffing levels are rarely achieved, leading to longer waits, a higher risk of errors, and reduced communication quality.

The physiological challenges of night work further complicate the situation. Working between 10 p.m. and 6 a.m. disrupts the circadian rhythm, reduces concentration and slows down decision-making. The greatest drop in alertness occurs between 3 a.m. and 5 a.m. – that's when, according to research, most medical errors occur. In the long term, night work increases the risk of cardiovascular disease, sleep disorders, depression and burnout syndrome.

The psychological burden of the night shift is often invisible, but deeply present. Resuscitation, polytrauma, working with patients under the influence of alcohol or psychoactive substances, as well as violent incidents, leave their mark. Healthcare workers in emergency rooms have twice the risk of anxiety and depression compared to other medical professions. At night, there is also a sense of isolation – there are fewer consultations available, less support, and decisions are often more difficult.

Staff safety is one of the biggest challenges. As many as 70% of employees in emergency services experience some form of violence during night work. Alcohol, longer waits, fewer staffing, and psychiatric crises create an environment in which incidents occur faster and more often.

Communication and patient education are also suffering. Staff and patient fatigue, noise and chaos of the environment lead to shorter and less clear explanations, which increases the risk of misunderstandings and repeat visits.

That is why measures that can improve work in night shifts are recommended: increasing the number of staff during critical hours, short breaks and rotations, education on recognizing fatigue, strengthening security, standardized protocols and digital tools that speed up communication. Psychological support for employees is equally important.

The night shift in the emergency center is not just working hours – it is a test of endurance, knowledge and humanity. That is why it deserves special attention and support.

Conclusion: The night shift in the emergency room is a complex combination of organizational, clinical and psychological challenges. Reduced resources, increased workload, physiological decline in wakefulness, and a higher risk of violence make night work particularly demanding. However, with adequate organization, support to staff and the implementation of modern recommendations, it is possible to significantly improve the safety and quality of emergency health care during the night.

WHEN ROUTINE BECOMES AN EMERGENCY – A CASE REPORT OF A COMPLICATED ACUTE MYOCARDIAL INFARCTION

Mirela Ćirović
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

A 50-year-old patient reported to the emergency room for intense chest pain, which lasts about 20 minutes before reporting for an examination. The problems were similar to the previous episodes for which he came earlier (frequent flyer), but so far the results have always been normal. This time, immediately after admission, an ECG was performed, which showed **acute anteroseptal myocardial infarction**, with pronounced ST elevations in the V1–V4 ducts. During the preparation of therapy, the patient suddenly lost consciousness, followed **by an epi-seizure**, with a pronounced tonic spasm of the whole body that lasted about one minute. At that time, it was not possible to safely administer defibrillation due to the risk of injury to the patient and staff. As soon as the spasms subsided and the

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patient's body became stable, the team proceeded to analyze the rhythm through a defibrillator, which registered **ventricular fibrillation (VF).**

A DC shock **was immediately delivered**, after which an organized rhythm was established. The patient began to breathe spontaneously, and vital parameters stabilized. After the return of circulation, complete initial therapy for acute myocardial infarction was administered.

According to the protocol, the patient should have been referred for **primary percutaneous coronary intervention (pPCI).** However, at that time, the angio-room at the Zajecar Health Center was out of order due to a technical failure. The option **of thrombolytic therapy** was considered as an alternative.

Immediately before the administration of thrombolytics, nurses noticed **pronounced supfusions and periorbital hematomas**, which were not present at admission. Due to the unclear etiology of these changes — which may indicate potential intracranial hemorrhage or another contraindication for thrombolysis — the team decided to **abandon thrombolytic therapy**.

The patient was urgently transported to the **Emergency Center of the University Medical Center Niš**, where **pPCI was immediately performed** with successful revascularization. After stabilization, additional diagnostics were carried out for unusual suffusions. An **MSCT of the endocranium** was performed, which showed **a normal finding**, with no signs of bleeding or traumatic changes.

The patient recovered without neurological consequences. Sufusions were thus attributed to a combination of short-term hypoxia during the VF episode and intense tonic spasm during the epi-seizure, which led to the rupture of the tiny capillaries.

This case highlights several key principles of emergency medicine: the need for constant caution even with "familiar" patients, a quick response and properly conducted resuscitation, the importance of good judgment when standard protocols need to be temporarily altered

A timely decision to avoid thrombolysis and urgently refer the patient to a tertiary center was crucial for a favorable outcome.

PEDIATRIC POLYTRAUMA IN HELICOPTER EMERGENCY MEDICAL SERVICE

A. Keranović[1,3], I. Miloš[2,3]

[1] DEPARTMENT OF EMERGENCY MEDICINE, UNIVERSITY HOSPITAL CENTRE ZAGREB, ZAGREB, CROATIA, [2] INSTITUTE OF EMERGENCY MEDICINE OF THE KRAPINA-ZAGORJE COUNTY, KRAPINA, CROATIA, [3] TEACHING INSTITUTE OF EMERGENCY MEDICINE OF THE CITY OF ZAGREB, ZAGREB, CROATIA

INTRODUCTION: Pediatric polytrauma is one of the leading causes of mortality and long-term disability in children. Helicopter emergency medical service (HEMS) enables rapid assessment, stabilization, and transfer of severely injured pediatric patients to tertiary care centers, especially in geographically remote areas. The aim of this study was to demonstrate the importance of HEMS in the prehospital management of pediatric polytrauma patients.

MATERIALS AND METHODS: Analysis was performed of an child with traumatic injuries following a stab wound injury, managed by a HEMS team. Vital parameters, airway management, hemodynamic stabilization, medication administration, and transport time to the hospital were analyzed. We also included data on primary interventions performed by the HEMS in 2025 in base Zagreb and compared them with ground emergency medical service (GEMS) interventions.

RESULTS: Upon arrival at the scene, the child was hemodynamically unstable, with impaired consciousness and signs of respiratory insufficiency. Following the primary assessment, immobilization was performed, intravenous fluid resuscitation and analgosedation were administered

also with other management related with polytrauma gudelineses. The total time from team arrival to admission at the tertiary center was less then one hour. Further diagnostic evaluation confirmed hemothorax with cardiac injury. After intensive treatment, the patient was discharged without permanent deficits. The other results showed that transport time to an appropriate facility was shorter with the HEMS team in all 75 interventions.

CONCLUSIONS: HEMS plays a significant role in the rapid and effective management of pediatric polytrauma patients. Timely assessment, appropriate management, and reduced transport time may significantly improve treatment outcomes and reduce mortality in severely injured children.

Keywords: pediatric polytrauma, helicopter emergency medical service, ground emergency medical service, prehospital care

WHO HIDES THE CAUSE OF SYNCOPE – A CASE REPORT OF PROGRESSION TO GRADE III AV BLOCK

Violeta Mladenović
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

A 55-year-old man, a postal worker, was rushed to the emergency room after collapsing at his workplace. This was the **third episode of loss of consciousness in the last two months**. The patient has previously been treated by a doctor and neurologist; An MSCT of the endocranium was performed with normal findings. Laboratory results showed slightly elevated liver enzymes, cholesterol and triglycerides, which is associated with occasional excessive alcohol consumption, which the patient does not deny. In the meantime, the psychiatrist prescribed an antidepressant and a sedative, assuming that the problems were psychogenic or alcohol-related.

On admission to the emergency center, the patient was stable: TA 155/90 mmHg, ECG: **sinus rhythm, sf 92/min AV block I degree, levogram**, no STT changes, glycemia 10.1 mmol/L, TT 36.1°C, SpO_2 99%, Neurological findings initially normal, no focal outbursts

The patient is offered **observation** in order to monitor vital parameters and any changes in the condition. At that moment, no therapy was prescribed, because the patient did not have active problems or hemodynamic instability.

During the first two hours of observation, the patient was calm, stable and without new symptoms. He was fine and insisted on going home. As there was no progression of clinical status, he was prepared for discharge. Before leaving, the patient got out of bed and headed to the toilet, but **collapsed again**, with short-term loss of consciousness.

After a quick examination, vital parameters were: TA 100/65 mmHg, pulse difficult palpable

A new ECG was urgently performed, which showed **a grade III AV block, with a ventricular frequency of 41/min**, which represented a clear arrhythmic etiology of his repeated syncopes. This finding completely changed the clinical picture and confirmed that the previous episodes were not psychogenic or exclusively related to alcohol, but the result of arrhythmia.

The patient was immediately stabilized and referred to a cardiologist, where a pacemaker was implanted for further treatment.

This case clearly shows how **deceptive syncope can be**, especially when there are distracting factors — such as alcohol, psychiatric therapy, or neat previous findings. The case confirms that any patient with recurrent loss of consciousness must be considered as potentially arrhythmically at risk, even when the initial findings seem benign.

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STRATEGIES TO EXPAND THE COMPETENCIES OF NURSES AND TECHNICIANS IN THE CONDITIONS OF CRITICAL SHORTAGE OF DOCTORS IN EMERGENCY SERVICES

Jovana Vešović
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

A critical shortage of doctors in emergency departments is one of the most visible symptoms of a burdened health care system today. In an environment that functions under constant pressure, where decisions are made in a minute that determine the outcome of life, each missing team member creates a void that is felt on all levels – from triage to resuscitation room. That is why in modern emergency medicine, there is more and more talk about expanding the competencies of nurses and technicians as a necessary, not just desirable strategy.

The reasons for this approach are deeply rooted in the reality of everyday work. A shortage of doctors leads to longer waits, overloading existing staff, and an increased risk of errors. Doctors who work in such conditions burn faster, which further deepens the problem. On the other hand, nurses and technicians represent the most stable part of the emergency system – professionals with long experience, developed practical skills and the ability to take on most of the clinical burden when they are provided with the conditions.

Models of extended competences have already been proven in practice in many countries. Advanced triage, led by nurses, allows for quick assessment of urgency, ordering of basic diagnostic tests, and initial care of patients. This significantly shortens the time until the first intervention, and doctors are freed up for more complex cases. Protocol-guided therapy allows nurses to start analgesia, antiemetics, bronchodilators, or intravenous hydration without waiting for a doctor, which is especially important for trauma, respiratory problems, and dehydration.

In units for minor injuries, nurses with additional education can independently take care of cuts, abrasions, superficial burns, simple fractures and suture minor wounds. This directs doctors to vitally endangered patients, and the flow through the emergency center becomes more efficient. The most advanced model – the Emergency Nurse Practitioner – allows nurses to independently diagnose non-urgent cases, order a laboratory and radiology, and even prescribe therapy. This model has proven to be extremely effective in environments with a chronic shortage of doctors.

Extended competencies are not limited to the hospital environment. In prehospital medicine, technicians and paramedics already apply protocols for acute coronary syndrome, asthma, anaphylaxis, administer medication according to algorithms, do ECG and telemetry, and use basic POCUS. Critical interventions are started even before they arrive at the hospital, which directly affects the outcome.

In order for such a system to be secure, clear protocols, standardization of procedures and clearly defined boundaries of responsibility are necessary. Continuing education, certification and simulation training are key to maintaining a high level of competence. Expanded roles do not mean working without a doctor, but rather teamwork with a clear hierarchy and available supervision. The legal framework must ensure the protection of personnel and regulate the prescription of therapy.

The advantages of this approach are numerous: shorter waiting times, faster initiation of therapy, relief from doctors, better availability of care and greater patient satisfaction. Challenges exist – resistance from some doctors, lack of educational capacity, uneven application of protocols and the risk of overloading nurses – but they are solvable with good organization and a clear strategy.

In conditions where the shortage of doctors is a reality, not an exception, expanding the competencies of nurses and technicians is one of the most important steps towards preserving a functional, safe and sustainable emergency system.

CONCLUSION: In the conditions of a critical shortage of doctors, expanding the competencies of nurses and technicians is a sustainable and effective strategy for the improvement of emergency services. With clear protocols, education and legal support, these roles significantly improve the quality of care and the stability of the system.

VIOLENCE AGAINST HEALTHCARE WORKERS IN EMERGENCY CENTRES – EPIDEMIOLOGY, RISK FACTORS AND PREVENTION MEASURES

Miljana Drobnjak
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

Violence against health care workers in emergency rooms is one of the most difficult challenges in modern medicine today. In a space where pain, fear, uncertainty and urgency intertwine on a daily basis, tension easily escalates into aggression. Emergency centers are places where quick decisions are made, where patients and families expect immediate intervention, and staff work at the limit of endurance. In such an environment, even the slightest disruption in communication can become a trigger for conflict. Health workers – doctors, nurses, technicians, triage workers – are on the front line of this pressure, often without adequate protection.

Epidemiological data clearly show the scale of the problem. More than 70% of emergency department employees experience some form of violence in their careers, while a third encounter incidents each year. Verbal abuse and threats are the most common form of aggression, but physical attacks are becoming more frequent, especially at night and at weekends. In Serbia and the region, emergency centers record the highest number of reported incidents, and the most common perpetrators are patients under the influence of alcohol or psychoactive substances, people with psychiatric disorders and family members who do not understand triage or are emotionally overwhelmed.

The risk of violence is shaped by a number of factors. Organizational problems – long waits, staff shortages, system overload, unclear protocols – create frustration for patients and families. Add to this the lack of security, video surveillance or security exits, leaving staff exposed without adequate protection. On the other hand, patients under the influence of alcohol, psychoactive substances or in acute psychiatric conditions pose the greatest risk for physical attacks. Pain, fear and panic further intensify aggressive behavior. Families, faced with uncertainty and worry, often react impulsively, especially when they do not understand why other patients are being cared for before their loved ones.

Staff are not immune to risk factors either. Fatigue, overwork, shift work with fewer employees, and lack of training to de-escalate reduce the ability of health professionals to recognize and prevent conflict escalation. Insufficient communication, often the result of a lack of time, further complicates the situation.

The consequences of violence are profound and long-lasting. Psychological effects include anxiety, depression, post-traumatic stress, and fear of coming to work. Professionally, bullying leads to a drop in motivation, avoidance of at-risk patients, and a decrease in the quality of work. Organizations are facing sick leave, staff turnover and the loss of experienced workers. In the most severe cases, violence leads to serious injury or death of a health worker, which leaves lasting consequences on the entire collective.

Violence prevention requires a comprehensive approach. Organizational measures include clear triage protocols, their active explanation to patients, an increase in the number of staff during peak periods, and faster administrative procedures. Physical and technical measures – the presence of security, video surveillance, panic buttons, architectural solutions for rapid evacuation and separate rooms for

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intoxicated patients – create a basic level of security. Educating staff on de-escalation, identifying at-risk patients, and safe communication techniques is key to preventing incidents. Legal measures, such as tougher penalties for assaulting a healthcare worker, mandatory reporting of incidents, and available legal and psychological support, create a framework that protects employees and raises public awareness.
Violence in emergency centres is not just a problem of individual incidents – it is a systemic challenge that requires a coordinated response. The protection of health workers is not only a moral obligation, but a prerequisite for quality emergency medicine and the stability of the entire health system.

FROM ADMISSION TO THE OPERATING ROOM - EMERGENCY PHYSICIAN IN RESUSCITATION DAMAGE CONTROL IN POLYTRAUMA

Dušan Milenković
UNIVERSITY CLINICAL CENTER NIS, EMERGENCY CENTER "PRIM. DR MIODRAG LAZIĆ LAZA"

Damage control (DCR) is a trauma management philosophy that emphasizes physiological stabilization rather than immediate definitive surgical repair. The primary goal is to combat the "lethal triad" – hypothermia, acidosis and coagulopathy. Early recognition of life-threatening bleeding is key to activating the DCR protocol. Permissive hypotension is often administered to maintain perfusion without worsening bleeding. Balanced transfusion strategies favor blood products over crystalloids, in order to restore oxygen delivery and correct coagulation disorders. Massive transfusion protocols typically strive for ratios that mimic whole blood, such as 1:1:1 for plasma, platelets, and erythrocytes. Adjuvant therapies, such as tranexamic acid, help reduce fibrinolysis and stabilize the thrombus. Point of care testing, including thromboelastography, allows for targeted correction of coagulation abnormalities. Active warming measures are crucial for the prevention of coagulopathy caused by hypothermia. Calcium supplementation is often required to neutralize citrate toxicity from transfused blood products (forming the so-called "lethal diamond" in trauma). The volume of resuscitation is deliberately limited to avoid complications such as abdominal compartment syndrome. DCR integrates surgical, anesthesiology, and intensivist teams into a coordinated, phased approach. Emergency physicians play a key role in initiating these measures during the chaotic early stages of trauma care. The philosophy emphasizes "buying time" for the patient until certain definitive surgical repair is provided. Eventually, DCR reshaped trauma management by shifting priorities from anatomical repair to physiological stabilization, thereby improving the survival of severely injured patients.

ORGANIZATIONAL MODELS OF THE EMERGENCY DEPARTMENTS

Vanja Panajotović
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

The organization of the emergency medicine service in the hospital is a key element of the effective care of acutely ill and injured patients. Modern models of organization are based on the principles of speed, accessibility, multidisciplinary approach and a clear hierarchy of decision-making. Depending on the size of the health institution, staff capacities and regional needs, different organizational

models are developed, but they all have a common goal — to provide timely and quality emergency health care.

One of the most common models is centralized emergency admission, where all patients with emergencies are referred to a single service that functions as the hospital's entry point. This model enables standardized triage, rapid diagnostics and optimal referral of patients to appropriate specialist services. The advantage of the centralized model is the efficient use of resources and the reduction of time to diagnosis and treatment.

The second model is a decentralized emergency system, where different specialist services (e.g. internal medicine, surgery, pediatrics) have their own emergency departments. This approach allows for faster involvement of specialists in patient care, but can lead to duplication of resources and difficult coordination, especially in situations with a large influx of patients.

The third model, increasingly common in modern hospitals, is the hybrid model, which combines centralized triage with specialist emergency units. Patients are first taken care of in the central emergency department, where they are assessed for urgency, stabilization and basic diagnostics, and then they are referred to specialized units according to the type of emergency. This model allows for optimal load distribution and efficient collaboration between different departments.

Triage plays a key role in all models, and it must be standardized, fast, and based on validated protocols. Triage teams are usually made up of experienced medical technicians and emergency physicians, trained to identify life-threatening conditions in a short period of time. Efficient triage allows for the rational use of resources and prevents overloading of critical sectors.

Organizational models also include clearly defined diagnostic flows, 24/7 availability of the laboratory and radiology, as well as the constant readiness of resuscitation and surgery teams. A multidisciplinary approach is essential, as emergency medicine encompasses a wide range of conditions — from cardiac and neurological emergencies to trauma and toxicological incidents.

Modern models of emergency department organization are increasingly relying on digital systems, electronic documentation, telemedicine and integration with prehospital services. This leads to better coordination, faster exchange of information and more efficient decision-making.

Regardless of the model, the success of the emergency department depends on trained staff, clear protocols, good communication, and constant willingness to work in high-pressure conditions. Optimal organization allows the hospital to respond to the needs of patients in everyday and emergency situations, ensuring a high level of emergency health care.

PNEUMOTHORAX

Lili Žura, Ines Florijančič, Tomo Orbanič
ZD KRANJ, PREHOSPITAL UNIT, SLOVENIA

Pneumothorax is the presence of air in the pleural space that leads to partial or complete collapse of the lungs. The clinical presentation varies from mild symptoms, such as dyspnoea, to life-threatening conditions, especially in tension pneumothorax. Timely recognition is crucial, because in hemodynamically unstable patients, the diagnosis is made clinically and requires immediate intervention without delay.

Diagnosis is based on clinical examination and radiological methods. Ultrasound (POCUS) plays an increasingly important role in emergency medicine due to its availability and speed, while chest X-ray remains the primary diagnostic method. CT of the thorax is the most sensitive diagnostic technique, but it is less commonly used in emergency situations.

The therapeutic approach depends on the size of the pneumothorax and the clinical condition of the patient. In minor and asymptomatic pneumothorax, conservative treatment with oxygen

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administration and monitoring is recommended. Major or symptomatic pneumothoraxes require aspiration or thoracic drainage. Tension pneumothorax is an emergency condition that requires immediate needle decompression, followed by thoracic drain placement.
Clinical decision-making is based primarily on the assessment of the patient's hemodynamic stability. Prompt and adequate intervention significantly improves the outcome of treatment, which is why pneumothorax remains one of the key diagnoses in emergency medicine.
CASE REPORT: We present a case of a patient **C. I. (born in 2001)** with recurrent spontaneous tension pneumothorax:

- **12/30/2025** – first event: the patient presents with pronounced dyspnoea and chest pain. Clinically and ultrasound suspicion of tension pneumothorax. Emergency needle decompression was performed in the field with clinical improvement, followed by thoracic drainage in the hospital.
- **01/16/2026** – Second event: recurrence of symptoms with rapid deterioration of respiratory status. Diagnosis re-established clinically and by POCUS. Emergency intervention with decompression and drainage performed.
- **02/17/2026** – Third event: Third recurrence of spontaneous tension pneumothorax in a short period of time. Emergency care again with the same therapeutic strategy.

This case highlights the significance of:

- Rapid clinical assessments without delay
- Key roles of POCUS in prehospital and emergency settings
- The Need for a Definitive Solution for Recurrent Pneumothorax

Keywords: pneumothorax, tension pneumothorax, POCUS, thoracic drainage, emergency medicine

ACUTE MYOCARDIAL INFARCTION WITH INITIALLY NORMAL FINDINGS

Goran Perge, Vladan Dragišić
HEALTH CENTER ŠID, EMERGENCY MEDICAL SERVICE

The aim of this study is to present a patient who presented with chest pain, but the initial findings were normal
A 54-year-old man was woken up by chest pain spreading to his left arm and was drenched in a cold sweat. The pain subsided a little, but it did not completely stop and after one hour he reported to the Emergency Medical Service. On examination, he had a blood pressure of 125/80 mmHg, the ECG showed no changes except for a high starting J-spot of up to 1 mm. Given the symptoms, a troponin test was performed and a result of 0.04 ng/l was obtained (normal result is up to 0.03). After half an hour, the ECG was done again and now the ST elevation in V2-4 is clear, and the patient is given appropriate therapy and transported to a tertiary institution where acute myocardial infarction is confirmed.
Although some patients do not have clear signs of acute infarction, if the symptoms are clear and convincing, all necessary tests should be done to rule it out. In the literature, there are data that up to 50% of acute heart attacks go without changes in the ECG.

APPLICATION OF NON-INVASIVE MECHANICAL VENTILATION IN THE INITIAL MANAGEMENT OF ACUTE PULMONARY EDEMA AT THE PREHOSPITAL LEVEL

Vladan Dragišić, Goran Perge
HEALTH CENTER ŠID, EMERGENCY MEDICAL SERVICE

INTRODUCTION : Pulmonary edema is a pathological accumulation of fluid in the extravascular space of the lungs. Medications used in the treatment of acute pulmonary edema include nitrates, diuretics, morphine, and inotropes. Patients also need ventilator support in the form of invasive or non-invasive mechanical ventilation. Non-invasive mechanical ventilation (NIMV) is a form of mechanical ventilation that provides ventilator support without invasively securing the airway. Aim: To present the use of non-invasive mechanical ventilation as a form of respiratory support at the prehospital level. Material and methods: This article presents two parallel case reports of patients with a clinical picture of acute pulmonary edema, different values of vital parameters, treated with different pharmacological therapy, but with the same mode of non-invasive mechanical ventilation. Results: In both cases, the use of non-invasive mechanical ventilation achieved hemodynamic stability of patients and improved the parameters of vital functions. Conclusion : The use of non-invasive mechanical ventilation is absolutely indicated and justified as a treatment measure for patients with the development of acute pulmonary edema at the prehospital level.
Keywords : acute pulmonary edema, non-invasive mechanical ventilation, prehospital level

EMERGENCY MEDICAL SYSTEM RESPONSE TO THE KOCANI NIGHTCLUB FIRE DISASTER

Nikola Brzanov[1], Jovana Stanoeva[1], Mila Ilie Mihajlova[1], Julijana Kazandziska[1], Matea Stojanovska[2], Vesna Krstevska[2]
[1] UNIVERSITY CLINIC FOR TRAUMATOLOGY, ORTHOPAEDIC DISEASES, ANESTHESIOLOGY, RESUSCITATION, INTENSIVE CARE AND EMERGENCY DEPARTMENT, FACULTY OF MEDICINE, UNIVERSITY "SAINTS CYRIL AND METHODIUS", SKOPJE - NORTH MACEDONIA, [2] PUBLIC HEALTH CENTER SKOPJE - EMERGENCY MEDICAL CARE SKOPJE

The Kocani nightclub fire on March 16, 2025, represented one of the most severe mass casualty incidents in North Macedonia’s recent history, rapidly overwhelming local healthcare capacities and requiring immediate activation of emergency response systems.
The first critically injured patients arrived at approximately 04:30 AM with extensive burns, inhalation injuries, respiratory compromise, severe pain, and associated trauma. More than 200 injured patients were admitted across the country, while 115 patients were transferred to 34 hospitals in 14 countries through international medical evacuation systems.
Management required rapid mobilisation of emergency physicians, anesthesiologists, surgeons, intensivists, pulmonologists, toxicologists, nurses, and transport services. Particular challenges included progressive inhalation injury and airway oedema, requiring continuous reassessment, early airway protection, oxygen therapy, mechanical ventilation, fluid resuscitation, and effective pain control.
The disaster pointed to the essential role of multidisciplinary teamwork, coordinated triage, institutional adaptability, and international collaboration in the management of large-scale burn and inhalation disasters.

Keywords: Burns; disaster medicine; emergency response; mass casualty incident; Kocani.

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INSIDIOUS SIGNS OF AORTIC DISSECTION

Milan Đorđević
UNIVERSITY CLINICAL CENTER NIS, EMERGENCY CENTER "PRIM. DR MIODRAG LAZIĆ LAZA"

INTRODUCTION: Aortic dissection (AD) is a severe disease with a high mortality rate. Unfortunately, it can be diagnosed late because of the high frequency of unusual symptoms at the beginning. The onset of AD is usually characterized by chest or abdominal pain, or sometimes back pain. Nowadays, more cases with an atypical, painless onset have been reported, which makes the diagnosis extremely difficult.
THE AIM of this article is to review the literature and investigate cases of unusual and sneaky symptoms of AD presented in our ED and to show importance of making the diagnose on time, thus prevent the lethal outcome.
RESULTS AND DISCUSSION: AD is classically manifested by severe, acute pain in the chest, abdomen or back. Atypical symptoms include headache, migratory pain, nonspecific gastrointestinal and neurological symptoms such as seizures, syncope, paraparesis and ischemic neuropathy. Painless AD is associated with persistent altered mental status, syncope, and focal neurological deficits. Early diagnosis is crucial due to the high mortality rate. Key objective findings seen in aortic dissection: pulse deficit in more than one limb, neurological deficit in more than one limb, myocardial infarction on ECG, widened mediastinum on chest X-ray, loss of aortic crest on chest X-ray, pericardial effusion and/or free fluid in abdomen on ultrasound.
Patients with painless AD, have higher incidence of syncope, congestive heart failure, and stroke compared with patients with painful AD. Mortality and aortic rupture are also higher. The fact that pain may decrease after the initial onset is falsely reassuring, leads to delayed recognition. The location of the pain varies depending on the site of the initial tear and the progression of the dissection.
CONCLUSION: AD is suspected in any patient with sudden, intense pain in the chest and/or back, especially when there are risk factors, pulse asymmetry, neurological or hemodynamic signs. Early medical evaluation with urgent imaging tests (CT angiography, trans thorasic/esophageal echocardiogram, or MR angiography) is vital because immediate surgical intervention can be life-saving.

EARLY CARE OF PATIENTS WITH ACUTE STROKE – CHALLENGES IN THE CONDITIONS OF A SMALL LOCAL HOSPITAL

Nataša Branković
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

Acute stroke remains one of the most critical conditions in modern medicine, and the success of treatment depends on every minute. Ideally, the patient is transported directly to a center that can provide CT diagnostics, intravenous thrombolysis, and mechanical thrombectomy. However, in the reality of small local hospitals – especially in rural and geographically isolated areas – this process is much more complex. It is in such settings that the prehospital phase becomes crucial for making decisions that determine whether the patient will receive reperfusion therapy at all in the therapeutic window.
Small hospitals often work with limited resources: the CT machine is not available 24 hours, the neurologist is present only in daily shifts, and the possibility of conducting thrombolysis depends on

the training and availability of staff. Mechanical thrombectomy is completely out of reach of these facilities, which means that patients have to be transported to regional centers, often more than an hour away. In such conditions, every step of prehospital care must be precise, fast and based on clear protocols.

Recognizing stroke in prehospital settings relies on simple but extremely effective FAST and BE FAST protocols. Facial asymmetry, arm weakness and speech disorder are the most common and reliable signs. However, in small communities, there is often a delay in calling an ambulance. Patients first turn to the chosen doctor, the ambulance on duty, or wait for the symptoms to pass, which wastes valuable time. Low health literacy and a lack of local education campaigns further increase the time to first medical contact.

EMS teams in smaller communities face their own limitations: fewer teams, longer arrival times, lack of training in stroke protocols, and the absence of telemedicine. In such circumstances, the decision to transport becomes the most difficult part of taking care of it. The dilemma of "nearest hospital or directly to a thrombectomy center" must be solved in real time, based on an estimate of the probability of LVO, the time of onset of symptoms, the availability of CT scans, and the distance of the regional center. Making the wrong decision can mean losing the chance of reperfusion.

Modern models of care are trying to adapt the protocols to the reality of small hospitals. The mothership strategy involves direct transport of patients with a high probability of LVO to a thrombectomy center, even if it is further away. This approach increases the chance of timely mechanical reperfusion. The "drip and ship" model is optimal when the local hospital has CT scans and trained thrombolysis staff – the patient is first taken care of locally and then transported to a regional center. This approach is especially useful when the regional center is very remote or when the patient has no signs of LVO.

In the prehospital phase, key interventions include stabilization of ABC parameters, control of glycemia, blood pressure and ECG, collection of data on "last known well" time, and early announcement to the hospital. It is important to avoid unnecessary interventions that delay transport, as well as aggressive lowering of blood pressure, except in exceptional situations.

Small hospitals can significantly improve outcomes through several strategic steps: organizing 24-hour CT availability, developing regional networks with clearly defined transportation protocols, and strengthening education of the population about stroke symptoms. In environments where resources are limited, organization, communication and clearly defined protocols become the most important part of the fight against the consequences of stroke.

CONCLUSION: Prehospital stroke care in the conditions of a small local hospital is a particular challenge due to limited resources, distance from specialized centers and lack of staff. Despite this, the application of modern protocols – FAST/BEFAST, LVO scale, early activation of stroke alert systems, telemedicine and smart triage – can significantly improve outcomes. The key is in a well-organized EMS, clear regional protocols and continuous education of the population and health professionals. In such conditions, even a small hospital can be an effective part of the stroke care chain and contribute to reducing mortality and disability.

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SEPSIS IN 2026. WHAT EVERY CLINICIAN SHOULD KNOW?

Višnja Nesek Adam
EMERGENCY DEPARTMENT, UNIVERSITY HOSPITAL "SVETI DUH", ZAGREB, CROATIA, UNIVERSITY NORTH, VARAŽDIN, CROATIA, FACULTY OF DENTAL MEDICINE AND HEALTH, OSIJEK, CROATIA

Sepsis in 2026 remains a life-threatening condition defined as organ dysfunction caused by a dysregulated response to infection. Early recognition is crucial, as delays in treatment significantly increase morbidity and mortality. Clinically, sepsis should be suspected in patients with infection accompanied by signs such as hypotension, altered mental status, tachypnea, reduced urine output, or elevated lactate. While tools like qSOFA and SOFA assist in risk stratification, clinical judgment remains essential. Management relies on rapid, protocol-driven interventions, including immediate administration of broad-spectrum antibiotics, prompt source control, fluid resuscitation, and vasopressor support when needed. Continuous monitoring and reassessment guide ongoing treatment, including de-escalation of antibiotics based on culture results, while supportive care addresses organ dysfunction and prevents complications. In 2026, artificial intelligence (AI) is increasingly integrated into sepsis care, with systems capable of detecting early warning signs from electronic health records, predicting clinical deterioration, and supporting decision-making, including antibiotic optimization. Although AI does not replace clinical expertise, it serves as a valuable adjunct to enhance early detection, risk stratification, and personalized management. Additionally, ongoing advances in precision medicine aim to tailor therapy based on individual patient characteristics, biomarkers, and real-time data, further improving outcomes when combined with AI-supported monitoring and timely clinical intervention.
Keywords: sepsis; artificial intelligence; early recognition; precision medicine

SIMILARITIES AND DIFFERENCES BETWEEN THE EMERGENCY MEDICINE SYSTEM IN SERBIA AND WESTERN COUNTRIES

Vojkan Vučić
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

Emergency medicine systems around the world have evolved in accordance with historical circumstances, resources, and health policies. Serbia and Western countries share the same goal – rapid identification and care of life-threatening patients – but organizational models differ significantly. The biggest differences relate to the composition of the teams, the philosophy of work and the level of interventions that are carried out on the field.

Emergency Medicine System in Serbia

Serbia applies the continental, so-called French model, in which the doctor is the central figure of prehospital care. A standard team consists of a doctor, a nurse/technician and a team driver. This model enables the implementation of advanced medical interventions already on the spot: intubation, analgesia, antiarrhythmic therapy, polytrauma management, neurological assessment and decision-making on transport priority. The advantage of the system is the high level of expertise available to the patient immediately upon arrival of the team.

However, the model is staff-intensive. A shortage of doctors in the prehospital sector leads to longer response times, especially in smaller settings. Physicians often work in conditions of high workload and limited resources, which can affect efficiency and availability.

Emergency Medicine in Western Countries

Most Western countries (USA, Canada, Great Britain, Australia, Scandinavian countries) use the Anglo-Saxon model based on:

- Rapid transport of the patient.
- Highly trained paramedics.
- A strong hospital emergency infrastructure.

The teams are usually two-member: EMT (basic level) and Paramedic (advanced level). Paramedics undergo many years of training and are authorized for a number of interventions: defibrillation, drug administration (analgesics, bronchodilators, antiarrhythmics, glucose, opioids), advanced airway techniques, ECG interpretation, recognition of STEMI and stroke, immobilization and stabilization of trauma. The doctor is only involved in special situations.

The advantages of this model are faster availability of teams, greater field coverage and more efficient logistics. The disadvantage is a narrower range of interventions compared to a doctor in the field, but this is compensated by fast transport and highly equipped emergency centers.

Similarities between the system

Despite the differences, the two systems share:

- standardized protocols (ACLS, PHTLS, ITLS, STEMI/Stroke algorithms),
- A high level of training,
- dispatch centers with call triage,
- Focus on reducing mortality and morbidity.
- Continuing education and simulation training.

Key Differences

1. Work philosophy

- **Serbia:** "on-site treatment" – the goal is stabilization before transport.
- **West:** "load and go" – the priority is fast transport to the hospital.

2. Team composition and competencies

- **The** doctor makes all the key decisions.
- **West:** Paramedics work independently within the framework of protocols.

3. Availability of teams

- **Serbia:** Limited number of doctors → longerresponse time.
- **West:** More paramedics → faster ground coverage.

4. Scope of interventions

- **Serbia:** A wider range of interventions, including complex ones.
- **West:** standardized, rapid and effective interventions.

5. Organization of the system

- **Serbia:** strong pre-hospital part, hospitals often overloaded.
- **West:** optimized prehospital part, hospitals highly specialized.

Which system is more dedicated to the patient?

If commitment is measured by the level of expertise available immediately in the field – Serbia has an advantage, because the presence of doctors enables complex decisions and advanced therapies.

If commitment is measured by the speed of the team's arrival, field coverage and efficiency – **Western countries** have the advantage, thanks to paramedics and strong logistics.

Conclusion: Both models are functional within their respective health systems. The Serbian model provides a high level of expertise in the field, while the Western model ensures speed, availability and organizational efficiency. The ideal solution is probably a combination of both approaches: a strong paramedical system with the availability of a doctor for the most severe cases.

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SUBCUTANEOUS INFUSION AS AN ALTERNATIVE TO INTRAVENOUS REHYDRATION IN PALLIATIVE TREATMENT

Željko Krsjanović
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

Subcutaneous infusion, or hypodermolysis, is taking an increasingly important place in palliative medicine as a method that allows a gentler, more humane and practical approach to rehydration and the administration of certain medications. In an environment where dehydration, weakness, difficult fluid intake and poor venous access are daily challenges, this technique represents a rational alternative to intravenous therapy, especially in elderly, oncological and multimorbid patients.

In a palliative context, the goal of therapy is not aggressive correction of laboratory parameters, but to alleviate symptoms that impair comfort – thirst, dry mouth, confusion, restlessness and general exhaustion. Subcutaneous infusion allows for gradual, physiologically acceptable resorption of fluids, which is in line with the philosophy of palliative care, which emphasizes the quality of remaining life and the avoidance of unnecessary interventions. Indications include mild to moderate dehydration, inability to take oral intake, the need for parenteral administration of analgesics, antiemetics or sedatives, as well as situations where venous access is difficult or impossible to establish.

Technically, the method is simple and accessible. The most common application sites are the front of the chest, abdomen, thighs and upper arms – regions with sufficient subcutaneous fat and no signs of infection or edema. Standard solutions such as saline, Ringer's or glucose are used, most often in total daily amounts of 500 to 1000 ml per application site. The infusion can be administered by gravity or by means of a pump, using a short subcutaneous needle or a butterfly set. Placement is simple and can be performed by a nurse, and with adequate education, family members, which is of particular importance in home palliative care.

The advantages over intravenous therapy are numerous. Subcutaneous infusion is less invasive, does not require finding veins, reduces pain and the number of punctures, which is especially important in cachectic and elderly patients with fragile veins. Access is more stable and long-lasting – the subcutaneous catheter can remain in place for several days with minimal care. The risk of complications is low, and those that occur are generally mild and local: erythema, swelling, induration or mild pain. There are fewer systemic complications than with aggressive IV rehydration, because the rate of resorption is naturally limited. The method is suitable for home and hospice use, is economical and requires fewer resources, which is important in systems with a growing number of palliative patients.

However, hypodermolysis has its limitations. It is not suitable for severe dehydration, shock or situations that require rapid fluid replenishment. The maximum amounts and rate of infusion limit it to mild and moderate cases. The clinical benefit may be less in patients in the terminal phase with very low performance status. Local side effects, although mild, may require a change of application site. The range of solutions and drugs that can be administered subcutaneously is limited, so it is necessary to strictly follow the protocols. An additional challenge is the lack of education of healthcare professionals and the prejudice that intravenous therapy is the "standard", although the evidence clearly shows that subcutaneous infusion is safe and effective in a palliative setting.

When properly administered, subcutaneous infusion is a rational, humane and clinically justified choice. It allows the patient to remain in a familiar environment, reduces the need for hospitalization and contributes to the preservation of dignity and comfort in the most sensitive phases of the disease. Optimal implementation requires an individual assessment of treatment goals, education of staff and families, and an open discussion of the expected benefits and limitations. This is the most important thing in palliative medicine.

THE SPECTRUM OF SHOCK

Natalija Vuković
UNIVERSITY CLINICAL CENTRE NIŠ, CLINIC FOR ANESTHESIA AND INTENSIVE CARE

INTRODUCTION: One of the most common clinical scenarios presented in the emergency care unit is shock. Inadequate tissue perfusion with cellular dysoxia (1) and division into 4 types are the main postulates connected to the pathophysiological definition of this serious issue. There are three basic phenotypes of shock: hypovolemic, distributive, and cardiogenic, which also encounter obstructive causes of the right ventricular failure (2).
UNDIFFERENTIATED SHOCK OR OVERLAPPING SHOCK: Over the past 40 years, progressive development of the understanding shock, its severity, response to treatment, and monitoring has taken place. New facts about previously mentioned, among others, showed that boundaries in the area of diagnosis, monitoring, and consequently management of shock, are frequently not so rigid. If we look at the diagnosis of shock, the term undifferentiated shock can apply when there is more than one phenotype of shock. Namely, a large proportion of the patients in shock are suffering from multiple insults, presenting with different phenotypes of shock at the same time. This imposes a different approach to diagnosis and treatment modality.
TWO PHASES OF CIRCULATORY DYSFUNCTION: Looking at the septic distributive shock, the study of Hernandez et al (3) pointed out two phases of the circulatory dysfunction.
The first phase is the initial, pre-resuscitative phase, mainly characterized by hypovolemia. In this phase, patients exhibit impaired perfusion with or without hypotension. In this phase, there is a scientifically proven correlation between parameters of the microcirculatory flow and parameters of the global, macrocirculatory flow.
The second phase appears in the situation of the unresolved circulation, so after fluid resuscitation. This is persistent circulatory dysfunction, and it is presented with different clinical scenarios. At this point, there will be a patient presenting with hypoperfusion without hypotension, or with so-called cryptic shock. The main characteristic of this phase is the discrepancy between markers of the global and microcirculation. In this way, assessment of a single parameter of the perfusion may lead to misleading conclusions and inadequate treatment.
RECOGNISING HIDDEN: According to the new ESICM guidelines on circulatory shock and hemodynamic monitoring (4), hypotension is not required for the definition of the shock. The main issue is hypoperfusion, as it was. In this way, clinicians must combine parameters of tissue perfusion with parameters of global hemodynamic evaluation. By means assessment of the skin perfusion, urinary output, and altered mental status must be a mandatory part of the shock diagnosis.
CONCLUSION: The definition of the shock, its monitoring and management, has evolved since. Hypotension may not be present in the patient with shock, even though it is frequently the main characteristic of circulatory failure. Monitoring of capillary refill time, skin temperature, and mottling score accompanies usual hemodynamic evaluation.

SIMILARITIES AND DIFFERENCES OF TRIAGE ON THE AMBULANCE PHONE AND TRIAGE IN THE EMERGENCY CENTER

Milana Marković
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

Triage is a key process in emergency medicine, the goal of which is to quickly identify life-threatening patients and prioritize care. Although emergency call center triage and emergency room triage are

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of Emergency and Disaster Medicine
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based on the same principles – speed, accuracy, and risk assessment – they take place in completely different conditions, use different methods, and have different options for intervention. Understanding their similarities and differences is important for improving the overall emergency care system.

SIMILARITIES. The first and most important similarity is **the goal**: both types of triage have the task of identifying the urgency of the condition and ensuring that the patient receives appropriate help in the shortest possible time. Both environments use **standardized protocols**, such as algorithms to identify life-threatening conditions (loss of consciousness, suffocation, chest pain, massive bleeding). Triassers – whether call center dispatchers or emergency room nurses/doctors – must possess a high ability **for clinical reasoning**, communication, and decision-making under pressure.

Another similarity is **the dynamics of the process**. Triage is not a one-time assessment; The patient's condition can change, so priorities must be constantly re-evaluated. In both telephone and hospital triage, assessment is based on a combination of subjective information (description of symptoms) and objective indicators (when available).

The third is **responsibility**. Triage errors can have serious consequences, so both dispatchers and hospital triage workers are trained to recognize "red flags" and act according to clearly defined protocols.

DIFFERENCES. The biggest difference lies in the **amount of information available**. Telephone triage is based solely on a verbal description of symptoms, often imprecise, emotionally tinged or incomplete. The dispatcher does not see the patient, cannot measure vital parameters and relies on the ability of the interlocutor to correctly convey the condition. In contrast, emergency room triage allows **for direct examination**, measurement of vital signs, application of diagnostic procedures, and direct observation of the patient's behavior and appearance.

Another key difference is **the possibility of intervention**. Telephone triage can only provide instructions – e.g. how to start resuscitation, stop bleeding or provide airway – while the actual care is only done after the arrival of the team. In the emergency room, the triage can immediately begin emergency measures, including oxygen, infusion, analgesia or resuscitation.

The third difference relates to **the organizational context**. Telephone triage is part of the pre-hospital system and has the function of deploying resources in the field, prioritizing the departure of teams and providing support until their arrival. Hospital triage, on the other hand, manages the flow of patients within the facility, determines the category of urgency (e.g., according to the ESI or CTAS system), and directs patients to the appropriate departments.

CONCLUSION. Although triage on the ambulance phone and triage in the emergency center are based on the same principles, they work in different conditions and have different capabilities. Telephone triage is the first filter of the system, where decisions are made quickly and often with limited information, while hospital triage allows for a more detailed assessment and immediate care. Their effective cooperation is crucial for the timely and adequate care of patients, especially in situations where time is of the essence.

ULTRASOUND IN PREHOSPITAL AND EARLY HOSPITAL TREATMENT OF THE PATIENT - ADVANTAGES AND DISADVANTAGES

Anđelija Gospodinović
HEALTH CENTER ZAJEČAR, EMERGENCY DEPARTMENT

Ultrasound in the prehospital and early hospital phase has become one of the most valuable diagnostic tools of modern emergency medicine, precisely because it allows key information to be

obtained immediately, at the point of care. The development of compact, battery-powered devices has made it possible for ultrasound diagnostics to move from radiology to ambulances, helicopters, emergency departments and triage zones. Within the POCUS concept, the same doctor who evaluates the patient simultaneously examines vital structures by ultrasound, which speeds up decision-making and increases the safety of therapeutic procedures.

In the prehospital phase, ultrasound plays a particularly important role in respiratory failure. Lung examination allows rapid differentiation of pneumothorax, pulmonary edema, consolidations and pleural effusion. These findings directly influence decisions about emergency decompression, oxygen administration, ventilation strategies, and hemodynamic therapy. In trauma patients, the FAST and eFAST protocols allow the detection of free fluid in the peritoneum, pericardium, and pleura, as well as pneumothorax. In prehospital settings, where time is of the essence, these findings help decide whether the patient should be transported directly to a trauma center, without being held in smaller facilities.

In patients in shock or cardiac arrest, ultrasound provides information that can change the course of care. Subxiphoid or parasternal imaging may reveal tamponade, right ventricular dilation as a sign of massive pulmonary embolism, severe hypovolemia, or absence of contractility. Based on these findings, the team can adjust the therapy – from volume resuscitation to the use of vasopressors or thrombolysis. Ultrasound also facilitates the placement of peripheral and central venous accesses, especially in hypotensive, obese, or hard-to-reach patients, thereby reducing the number of punctures and the risk of complications.

The benefits of ultrasound in the prehospital and early hospital phase are numerous. Diagnostics takes place "bedside", without the need to transport the patient, which is crucial in unstable patients. The method is non-invasive, without ionizing radiation, suitable for pregnant women, children and polytrauma. Ultrasound findings guide therapy and triage, change hospital choice and priority of interventions, and the combination of clinical examination and POCUS increases diagnostic safety, especially in uncooperative or intubated patients. Modern handheld devices make it possible for ultrasound to become a standard part of emergency room equipment.

Still, the method has limitations. Ultrasound is an extremely dependent – the quality of the findings depends on the knowledge and experience of the person performing it. Prehospital conditions are often difficult: vehicle vibrations, limited space, cold, blood, bandages and immobilization can reduce image quality. There is also a risk of delaying transportation if examinations are carried out in the field for too long, which is especially dangerous with polytrauma. Ultrasound can not replace CT, MRI or X-ray in the diagnosis of retroperitoneal injuries, small parenchymal lesions or complex fractures. Without clear protocols and standardization, there is a risk of chaotic implementation and insufficient documentation.

In the early hospital phase, ultrasound is followed by prehospital POCUS. It enables rapid re-evaluation of findings, integration into trauma and shock protocols, and planning of further diagnostic procedures. Although hospital conditions are more favorable, ultrasound remains a complementary rather than a definitive method, but its value in the initial assessment is invaluable.

Ultrasound in the prehospital and early hospital phase is a powerful, fast and safe tool for assessing vitally endangered patients. In order for its implementation to be optimal, clear protocols, continuous education and quality control are necessary. Only in this way can POCUS become a standard pillar of emergency medicine, and not just an additional option.

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of Emergency and Disaster Medicine
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HOW TO RECOGNIZE ACUTE RENAL IMPAIRMENT

Dušica Gujaničić
UNIVERSITY CLINICAL CENTRE OF SERBIA, BELGRADE, EMERGENCY CENTRE

Acute renal impairment (ARI) refers to potentially reversible nephron damage, which is manifested by a sharp increase in azotemia accompanied by hydroelectrolyte disturbances,
with or without a decrease in the strength of diuresis. It presents a heterogeneous syndrome not only in terms of exposure (low cardiac output, sepsis, major surgery, nephrotoxicity) and
pathophysiology (hypoperfusion, inflammation), but also with regard to the clinical presentation (severity and evolution). It is estimated that every year about 1.7 million people worldwide die from ARI. Initial Treatment is based on early recognition and early treatment of the underlying causes in order to prevent further kidney damage.

By analyzing the etiology and clinical presentation of ARI in the Emergency Department (ED) of the Emergency Center of the University Clinical Center of Serbia, attention is drawn to the most diverse manifestations of this syndrome, from inconspicuous clinical pictures to vitally endangered patients who need immediate urgent measures of initial care and treatment. The largest number of patients is triaged as an emergency and examined in the red and yellow zones, and a smaller number of patients are postponed in the emergency zone and examined in the green zone. It is very important to keep in mind the fact that out of the total number of patients examined in the zone of delayed urgency, two-thirds of patients have ARI. It is necessary to think about these, often non-specific patients.

The high incidence of ARI and high hospital mortality in patients admitted to intensive care units pose a significant challenge for emergency medicine specialists. Traumatism, gastrointestinal and cardiovascular causes are the most common reasons for admission to intensive care units. Sepsis, with or without septic shock and hypovolemia are the most common causes of ARI itself.

In the initial management of patients who have ARI, it is important to:

1. Determine the cause of ARI
2. Optimization of hemodynamics
3.Application of support for the prevention and treatment of complications

It is necessary, at the hospital level, to determine gas analyses, measurement of diuresis and ultrasound examination, for monitoring and timely disposal.

Through practical examples, ARI is presented in a plastic way and each is approached individually.

Keywords: ARI(Acute renal impairment), ED (Emergency Department)