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ABSTRACT BOOK

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A BRIEF OVERVIEW GUIDELINE FOR ACUTE AORTIC SYNDROME PUBLISHED 2024

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Introduction: The guidelines have the task of evaluating and summarizing the available evidence with the aim of suggesting to healthcare professionals the best diagnostic or therapeutic approach for each patient.
Synthesis of results: Acute aortic syndromes (AAS) are life-threatening emergencies involving aortic wall damage, including classic Acute aortic dissection(AAD), Intramural Hematoma(IMH), Penetrating Atherosclerotic Ulcer(PAU), aortic pseudo-aneurysm, and traumatic aortic injuries (TAI).
The anatomical classifications: Stanford and the DeBakey systems being the most widely used. A new classification considers the intimal tear's entry site and dissection extension. This classification guides treatment decisions for sealing the entry tear. AADs limited to the aortic arch or originating as retrograde dissections from the descending aorta that extend into the arch and stop before the ascending aorta are termed as non-A non-B aortic dissection. European update of the Stanford classification—Type Entry Malperfusion (TEM) classification—has been proposed. This combines information about the type of dissection, its extent, and the presence of complications (malperfusion).
In relation to the time elapsed from the onset of symptoms to diagnosis, AAS can be divided into hyperacute (<24 h), acute (1-14 days), subacute (15-90 days) and chronic (>90 days)
Recommendations for diagnostic work-up of AAS: CCT from neck to pelvis is recommended as the first-line imaging technique in patients with suspected AAS since it is widely available.
Recommendations for medical treatment in AAS: In patients with AAS who can be managed conservatively and who achieved haemodynamic targets with i.v. anti-impulse therapy. If the patient has a contraindication for BBs, a non-dihydropyridine calcium blocker should be considered. The goal is SF 60, SBP 120, and pain control.In patients with suspected AAS, focused TTE (with use of contrast if feasible) is recommended during the initial evaluation. CMR should be considered as an alternative imaging technique if CCT is not available.
Recommendations for follow-up after treatment of AAS. In medically treated type B AAS or IMH, follow-up imaging is recommended at 1, 3, 6, and 12 months after onset, then yearly if imaging findings are stable. In medically treated PAU, follow-up imaging is recommended at 1 month after diagnosis, then every 6 months. After open surgery for AAS, follow-up imaging by CCT and TTE within 6 months, then CCT at 12 months. If no complications occur within the first 5 years, CCT every 2 years.
Key words: acute aortic syndrome, recommendations

POCUS IN CRITICALLY ILL PATIENTS IN THE ED

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Point-of-care ultrasound (POCUS) is a focused, bedside imaging technique designed to address specific clinical questions in critically ill patients, offering rapid, goal-directed assessment.
POCUS is an essential tool for bedside assessment, used primarily to answer binary clinical questions such as "rule in" or "rule out" certain conditions. Key applications of POCUS include rapid assessment in trauma (e.g., FAST scan), lung, cardiac and abdominal imaging, and evaluation of symptoms like abdominal pain, dyspnea, and suspected small bowel obstruction. Case studies highlight scenarios in

which POCUS proved invaluable for detecting conditions such as hydronephrosis, aneurysms, and syncope in elderly patients.
Challenges and limitations of POCUS are operator dependency, limited field of view, patient restlessness, and the need for thorough training and documentation. Despite these limitations, POCUS offers significant advantages: faster diagnosis, earlier intervention, reduced need for patient transport, and minimized CT usage, all contributing to shorter hospital stays.
In conclusion, POCUS is an indispensable tool in managing critically ill patients. It requires proficiency in various techniques, continuous practice, and interdisciplinary collaboration. By integrating POCUS into standard practice, healthcare providers can enhance diagnostic accuracy and patient care outcomes in critical settings.

RESUSCITATION OF THE DROWNING CHILD

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Drowning is defined as "the process resulting in primary respiratory impairment from submersion/immersion in a liquid medium." The incidence of drowning is highest in children between the first and fourth year of life, due to lack of perception of danger and lack of supervision by adults, and afterword's in adolescent boys due to diving, as well as alcohol and drug consumption.
After the submersion, reflex inspiratory efforts cause the aspiration of water which triggers laryngospasm leading to asphyxia. Prolonged hypoxia causes laryngospasm to abate which allows further aspiration, acute respiratory distress syndrome (ARDS) and consequently cardiac dysfunction. Depending on duration of cerebral hypoxia, neurological impairment can be debilitating.
Resuscitation of the unconscious child who is not breathing starts in the safe environment, with 5 rescue breaths, then continues with 30:2 ratio of chest compressions and rescue breaths and application of 100% O2 as soon as possible. Consider early rapid sequence intubation to minimize risk of aspiration and mechanical ventilation at least for 24 hours. Lung injury may take up to six hours to present. Warm the child if hypothermic, since atropine, lidocaine and defibrillation are ineffective with low core temperature although hypothermia can have a neuroprotective effect, especially in children.
The outcome of cardiopulmonary resuscitation depends on the time of submersion and the age of the child.
More than 85 % of the cases of drowning are preventable by swimming training, use of safety barriers for pools, ponds, water tanks, wells and focusing on the importance of adult surveillance.
Key words: drowning, children, resuscitation, prevention.

HOSPITAL - ACQUIRED ANAPHYLAXIS

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Anaphylaxis is a severe, life-threatening hypersensitivity reaction that occurs suddenly, simultaneously affecting multiple organ systems, and can have a fatal outcome. With this paper, I aim to inform you about the frequency, causes, and risk factors for the occurrence of anaphylaxis in hospital settings, which can be of practical importance to emergency medicine doctors whose scope of

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work has recently included secondary and tertiary healthcare institutions. Severe anaphylaxis occurs relatively rarely among hospitalized patients, with a risk of 1 case per 5000 hospital admissions.
The most common triggers of anaphylaxis in hospital settings differ depending on whether the patient is in a surgical (muscle relaxants, latex, antibiotics, chlorhexidine, colloid solutions) or non-surgical environment (streptokinase, antivenom serum, contrast agents). The diagnosis of anaphylaxis is primarily based on the clinical picture. The earlier the anaphylactic reaction develops, the more severe the clinical manifestations will be, and the outcome more uncertain. Specific laboratory tests should be performed within one hour: determination of mast cell tryptase concentration and histamine levels. Skin tests are recommended only after 4 - 6 weeks due to the possibility of false-negative results caused by depleted (degranulated) mast cells.
The treatment of anaphylactic reactions in the perioperative period is similar to the treatment of anaphylaxis in other clinical situations, but has its own specifics. The "first-line" therapeutic approach involves: immediately discontinuing the administration of the potential allergen, notifying the surgeon about the occurrence of an anaphylactic reaction, securing the airway as soon as possible (in case the surgery is performed under regional anesthesia or analgesosedation) due to the possibility of developing angioedema and the later difficulty of establishing the airway, ventilating the patient with 100% oxygen, Trendelenburg position, placing multiple venous lines, and administering infusion solutions. Timely administration of adrenaline is crucial for a favorable outcome in perioperative anaphylaxis. The "second-line" therapeutic approach involves the use of bronchodilators, corticosteroids, and antihistamines. In patients who require the administration of a drug to which they are allergic, desensitization shuld be performed.

BLOOD SAMPLING FOR BLOOD GAS ANALYSIS

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EMERGENCY MEDICAL SERVICE ZAJEČAR

Introduction: Blood Gas Analysis (BGA) test is a blood test that requires a sample from an artery in body to measure the levels of pH, pO2, pCO2, bicarbonate concentration, as well as anion gap.
Data source and selection of materials: Retrospective analysis of literature with settings: arterial blood gas (ABG,) test: Searching is done through: PubMed, Medline and electronic journals accessible via KoBSON as well literature available in the library.
Results of synthesis: Heparinized blood is used for BGA but the correct amount of heparin and blood is very important to prevent coagulation of blood and to obtain accurate test results. It has been recommended by the International Federation of Clinical Chemistry (IFCC) that heparin should be taken in the syringe to lubricate the inner wall of the syringe and then heparin should be expelled from the syringe completely and at least 20 times the dead space volume of blood should be collected. Under-filling the syringe would result in erroneous results due to dilution and chemical effects. The dilution effect of heparin may cause a fall in pCO2 and bicarbonate concentration and since the heparin is acidic the use of concentrated heparin may result in an increase in pCO2 and reduction in pH. pO2 may also be affected by too much heparin. Steps for blood collection for BGA
1. Take a little amount of heparin in a 2ml syringe to lubricate the inner wall of the syringe and then flush out the heparin completely. 2. Collect 2ml arterial/venous blood in this heparinized syringe (filling the syringe completely is very important).
3. Remove air bubbles quickly, if any, and place the needle cap (don't bend the needle as it may hurt the analyst) or better insert the tip of the needle into a rubber cap (of injection vial) or a bung to prevent any leakage of gases. Mix the blood in the syringe gently by rotating the syringe between the palms of the hands to ensure mixing of blood with heparin.

4. Send the sample to the laboratory immediately. If it is not possible to send immediately then keep the syringe in a container having ice-water slurry (not with ice alone) but not for too long because the plastic syringes are partially gas permeable and this permeability increases at a lower temperature.

CANNABINOID HYPEREMESIS SYNDROME IN THE EMERGENCY DEPARTMENT

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Chronic, heavy use of marijuana is associated with the appearance of cannabinoid hyperemesis syndrome (CHS), which can present with abdominal pain, nausea and repeated severe vomiting. In this case report and literature review, we will present a 27-year-old patient who was diagnosed and treated in the emergency department (ED). Besides classic herbal marijuana, more and more cases are associated with the use of synthetic cannabinoids. The symptoms do not respond to opioids, analgesics and classic antiemetics. Patients present recurrently in ED, and they usually require extensive diagnostics. Many patients report almost immediate relief of symptoms after a bath or shower in hot water, or ingestion of hot water. The pathophysiology of this syndrome is not clear. Endogenous cannabinoids show increased binding affinity to other G protein receptors, such as the cation channel TRPV1. Relief with hot water may indicate dysfunction of pain perception, increased concentration of substance P, and activation of the TRPV1 system, and these factors may help clarify the origin of this syndrome, as well as the search for new treatment modalities. This hypothesis is supported by reports of successful treatment of CHS with topical capsaicin. There are also papers on the successful treatment of CHS with benzodiazepines, dopamine antagonists and substance P inhibitors. Current evidence shows that treatment with haloperidol is better than other treatment modalities. After discharge, patients should be educated that the syndrome is likely to return if the individual continues to use cannabinoids, and symptoms should resolve completely within 10 to 14 days.
Key words: cannabinoid hyperemesis syndrome, emergency department, toxicology

CASE OF ASPHYXIA DUE TO AIRWAY OBSTRUCTION BY A DIAPER IN A PERSON WITH MENTAL DISABILITY

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Background: Obstruction of airways by a foreign body is one of the most urgent conditions in medicine, from which between 700 and 1,000 people in America die annually. Case report: A 24-year-old woman, extremely malnourished (BMI=12.33), was submitted for the autopsy. From the medical records, it is known that she was mentally disabled. She had severe hearing and vision impairment and stenosis of the pulmonary artery due to an intrauterine infection with Rubella virus. In the hypopharynx, pieces of diaper were found that completely blocked the opening of the larynx. The exact contents were found in the esophagus and stomach. Discussion: The incidence of bolus-induced deaths is 0.18%. Children, elderly, people without teeth, alcoholics, and people with mental and neurological disorders are at increased risk. The clinical presentation comes on quickly, accompanied by cough, dyspnea, and wheezing. Death can occur quickly when large foreign bodies completely

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block the airway or, by a reflex mechanism, are delayed due to complications such as infections. The person in our case had severe neuropsychiatric illness caused by intrauterine infection with the rubella virus, which could lead to swallowing control disorders, which was recorded in as many as 61% of cases. In people with mental disorders, there is a need to chew things as a way to overcome anxiety, which would explain the need to chew diapers. Conclusion: Although not very common, foreign-body asphyxia does happen. Children, elderly, alcoholics, and people with intellectual disabilities are at special risk and require adequate care and stricter supervision.
Keywords: asphyxia, foreign body aspiration, mental disability, autopsy, emergency medicine

CONGENITAL TRANSMESOCOLIC INTERNAL HERNIA AS A CAUSE OF SUDDEN DEATH

V. Milošević, Milena Kontić, M. Bogdanović, Tijana Petrović, Tijana Gojković, Irina Banjanin Bojana Radnić
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Background: Internal abdominal hernias (IAH) represent a protrusion of the abdominal organs through an aperture on the mesenterium or peritoneum, accounting for approximately 0.5-5.8% of all intestinal obstructions. Case report: An 89-year-old woman was seen by a surgeon due to 3 days-long constipation and abdominal pain. She was conscious, afebrile and without vomiting at the first examination. On the same day, her state worsened, she developed acidosis and electrolyte disturbance, which were followed by a fatal outcome. At the autopsy, an incarceration of the small intestine was found. A large segment of the small intestine protruded through a 3 cm wide congenital defect on the mesocolon transversum. The intestinal wall was necrotic, colored dark purple. No signs of peritonitis were present. Discussion: Internal hernias are rare, with an overall incidence of 0.2-0.9%, and may be congenital or acquired, caused by trauma or surgery. Transmesocolic hernias are a rare type of IAH with incidence of 5-10% of all internal hernias. Symptoms are usually abdominal pain, distension, nausea, vomiting, diarrheas and constipation. Sometimes sudden death may happen without previous symptoms. Ischemia of the intestine, intestinal perforation, sepsis, water and electrolyte disturbances and elevated intra-abdominal pressure are possible mechanisms of dying and may develop in a short period. Due to their nonspecific presentation, IAH are hard to diagnose, and more than 50% are fatal. Conclusion: Although rare, IAH, due to its nonspecific clinical presentation, represents a life-threatening condition that is difficult to diagnose in time and are associated with a high mortality rate.
Keywords: intestinal obstruction, intestinal incarceration, transmesocolic hernia, autopsy.

CROATIAN EMERGENCY HELICOPTER SERVICE

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In April 2024, a network of emergency helicopter services was established in Croatia with four bases. The base located near Zagreb covers as many as eight counties. In one of them, Krapina-Zagorje County, a polytraumatized patient with a head injury was treated through the combined efforts of a ground team and the emergency helicopter service, which was called upon the ground team's arrival at the accident site. The time elapsed from the call to the patient's arrival at the appropriate hospital

facility was 1 hour and 11 minutes, and the time from the activation of the HHMS (Helicopter Emergency Medical Service) to transport to the appropriate hospital was 44 minutes. The accident occurred at a location 62 kilometers from the facility capable of definitively treating the patient's injuries. Ground transport alone would have taken around an hour. This time would also need to account for the period the patient spends in the nearest facility where the ground team takes her for initial stabilization before being transferred to the appropriate facility, which could be extended depending on road conditions.
According to the guidelines of the European Trauma Society, injured patients should be transported as quickly as possible to a facility equipped for definitive care. Studies have shown that prolonged transport time is associated with worse outcomes. One study compared injured patients transported to appropriate facilities by ground teams with those transported by helicopter teams, showing that patients transported by helicopter had a 1.5 times higher chance of survival and a higher likelihood of being discharged from the hospital for rehabilitation. These studies, along with the patient transported by the HHMS team, demonstrate that helicopter transport plays a significant role in reducing mortality and disability.
Keywords: helicopter service, golden hour, polytraumatized patients

DEVELOPMENT OF ECG AND TROPONIN RAISES IN DE WINTER SYNDROME

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Background: De Winter syndrome, first described in 2008., represents an occlusion of left anterior descendin (LAD) artery. It is highly similar to ST – elevation myocardial infarction, presenting as upsloping ST segment with highly peaked T waves from V2 to V6. There are three types of de Winter syndrome. Emergent clinical recognition of de Winter synrome are crucial for overall patients outcome and therefore catheterisation could be done. Emergency revascularization restores coronary blood flow to improve the clinical outcomes of patients with ST-segment elevation myocardial infarction (STEMI), which is associated with severe myocardial injury and a high mortality rate. Diagnosis of STEMI as early as possible can be life-saving, and relies mainly on the detection of persistent uplift ST-segment elevation in two or more contiguous relevant leads. A recent trial showed that the mortality of patients with STEMI would increase by around 3.3% if primary percutaneous coronary intervention (PCI) was delayed by 10 min.
Keywords: De Winter syndrome, ECG, Troponin

ECG EQUIVALENT STEMI – DE WINTER'S SIGN

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The formation of a "STEMI network" in the territory of Vojvodina implies that the emergency medical service (EMS) doctor, following protocol, makes decisions regarding the need and type of reperfusion therapy. Coronary artery occlusions that present with rare and atypical ECG findings, such as the De

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Winter pattern, can pose a diagnostic challenge for doctors, unnecessarily prolonging the time from the patient's first contact to primary PCI.
In 2008, De Winter and his team published a characteristic ECG presentation indicating occlusion of the left anterior descending artery (LAD). Instead of ST elevation, it shows an upsloping ST depression of 1-3 mm in leads V1-V6 starting from the J-point, followed by a positive symmetric T wave. In most patients, ST elevation in the AVR lead was also found. De Winter observed this ECG pattern in 2% of patients with LAD occlusion in a sample of 1,532 patients.
This paper presents a patient with a typical clinical picture of myocardial infarction, whose ECG showed the De Winter sign. The patient was first transported to the regional General Hospital in Sombor, which at the time did not have the capability for primary PCI. Upon admission, the ECG findings changed, showing ST elevations in the precordial leads. Only then was the STEMI network activated, and the patient was transported for primary PCI.
Failure to recognize the De Winter sign or rigid insistence on clear STEMI ECG patterns can lead to delays in the activation of the STEMI network. Establishing telemedicine, which would enable rapid information exchange between EMS doctors and hospital doctors, could benefit patients.
Keywords: De Winter, myocardial infarction, STEMI network

HOW TO RECOGNIZE AND TREAT BURN SHOCK IN CHILDREN

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INTRODUCTION. Burns are the fifth the most common cause of injury in children. Children under the age of 4, who live in low- and medium- developed economic countries are at a particular risk of developing burns. Anatomical and physiological characteristics, such as thinner and less resistant skin, larger body surface area relative to body weight, immature immune and thermoregulatory systems, make these patients more sensitive for developing larger and deeper burns. In addition, burns of over 40% of the total body surface area, inhalation burns, as well as hospitals with less experience in the treatment of burns, represent risk factors for the fatal outcome of these patients. Therefore, before starting their treatment, an accurate assessment of the total body surface area and depth of the burn should be made, which will enable adequate fluid replacement. Fluid replacement is started with isotonic solutions such as Ringer-lactate, and total fluid deficit is calculated most often based on the Parkland formula, which takes into account the percentage of the total burned surface area and the body weight of the patient. Half of the calculated fluid deficit should be given within 8 hours of the injury, and the other half within the next 16 hours. In addition to isotonic solutions, colloids such as albumin can be administered 8 to 12 hours after the injury, at the earliest. This significantly reduces the amount of prescribed isotonic solutions, promotes satisfactory diuresis and reduces peripheral edema. Monitoring of adequate fluid replacement is best achieved by monitoring the hourly diuresis of these patients. In addition to fluid replacement, these patients need to be provided with adequate analgesia, antibiotic therapy, and other supportive therapy. CONCLUSION. Recognition of risk groups of patients, adequate assessment of the total body surface area of burns and timely implementation of therapeutic procedures can significantly improve the final outcome in these patients.

Key words: burns, treatment, children.

HIGH VOLTAGE ELECTRIC SHOCK - CASE REPORT

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Abstract: Electrical injuries are injuries that can be of high or low voltage and result in variety of injuries ranging from skin burns to damage to internal organs. High voltage electrical injuries are unusual but show a high rate of mortality. Tissue damage can result directly from the current passing through the body or conversion of the electrical energy to heat energy as it is met with various levels of resistance within the different tissues in the body.
Introduction: The harmful effect of electricity on the human body depends on several factors such as: voltage, strength, frequency, body resistance, length of action, place and method of inclusion of the body in the circuit, body condition, external conditions, etc. An electric shock can also cause cessation of breathing, loss of consciousness, irregular heartbeat and cardiac arrest, burns at the point of contact with the source of electric current, convulsions and death.
Case report: On the field, we find a 63-year-old patient sitting on a chair, conscious, without difficulty communicating with us, and states that he received burns by accidentally self-injury on the top of the building where he was fixing the fence, where he hooked the wires of high-voltage power lines that ran above the building, while carrying the aluminum pipe for the fence. We see injuries in the form of high degree burns in the area of both hands, then in the area of the left foot a wound with a necrotic area of about 4x3 cm, with irregular edges, and in the area of the right foot from the rear (palmar) side, an oval wound with a necrotic mass in the central part, a smell like burnt flesh is present and the patient complains of severe pain in those areas, mostly in the feet. During the examination of the patient, of the vital parameters we determine first prolonged capillary filling and then we measure blood pressure TA = 80/50, arrhythmic heart action - frequency around HR = 60/min, respiratory frequency RF 14/min, oxygen saturation SpO2 = 96%, without neurological symptoms. On the ECG we see occasional ventricular extrasystoles (VES). We open the intravenous line, turn on the NaCl infusion solution 500ml and treat the wound and cover it with sterile gauze, and we decide on urgent transport to the Emergency Center due to the present injuries and the nature and mechanism of the high-voltage electric shock injury, and of course we monitor the vital parameters and heart rate and action all the time during transport. In the Emergency Center, he was fully examined, stabilized, burn treatment with excision was performed, less than 10% of the body surface was treated and excised, partial thickness skin transplant was performed too for a small granulating area - OP: Nerectomio et reconstructio defecti cum AT cutis se. Thiersch. At the clinic, during treatment, he was treated daily with antibiotic, anticoagulant and analgesic therapy. The postoperative course went well, the wound was calm and the transplants were consolidated. After 20 days of hospitalization, he was discharged from the clinic with good local findings and in good general condition.
Discussion: An electric shock can cause burns to the skin and deeper tissues including muscles and nerves. As the victim is thrown back by the electric shock, they can also sustain mechanical injuries. An electric shock can cause heart irregularities and cardiac arrest. Arrhythmias are common with high-voltage electric shock, and may develop later. At the moment of an electric shock, the most common loss of consciousness occurs, which usually lasts. Mental disorders, such as fear, insomnia and severe nervousness, remain for a long time. When the current is stronger, small bleedings in the brain occur, with permanent harmful consequences from brain injury. Burns should also be taken care of, but by carefully removing parts of the suit except for those stuck to the skin, forceful removal of those parts causes severe pain and together with the parts of the suit, parts of the tissue peel off. The

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burned surface should be covered with sterile gauze or a bandage as soon as possible. Later, give the injured person to drink as much liquid as possible, and on the spot include the solution intravenously, if possible.
Conclusion: Electric shocks are not such common causes of accidents and fatalities, but they appear sporadically and as such must be the subject of discussion in emergency medicine.
Key words: electric shock, high voltage, burns, arrhythmia, necrosis, skin transplantation

IF YOU LOOK, YOU WILL SEE

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INTRODUCTION: Injuries caused by firearms represent a special challenge and an exceptional opportunity to provide the patient with quick and adequate care through a quality examination.
AIM: to point out the importance of examining the whole body of a patient injured by a firearm.
CASE REPORT: The patient (male, 40 years old) was brought by EMS with injuries allegedly caused by a firearm about 6 hours before admission to our institution. He was referred for an injury to his left forearm, which was previously treated surgically in the primary institution, where scanty radiological diagnostics were performed. Vital parameters on admission were BP 139/111mmHg, HR 120/min, RR 14/min SpO2 100%. Upon arrival, the patient is conscious, oriented, discretely dyspnoic, with a weaker pulse over the a. radialis on the right side, pale skin and visible mucous membranes, diaphoretic, takes a passive position in bed and gives the impression of a hemodynamically unstable patient. General examination shows no actively bleeding wounds. Left forearm is placed in plaster immobilization. Head and neck, right arm and both lower extremities are without signs of injury. The thorax is cylindrical, symmetrical, respiratory movable on both sides. On the left side of the chest, about 4 cm below the nipple, there is a shallow circular wound with blood-soaked edges that raises suspicion about a possible entry point of a penetrating injury, despite the anamnestic and heteroanamnemic data that it is only a superficial injury. The back of the chest is without signs of injury. Abdomen is in the plane of the chest, soft to palpation but diffusely painfully sensitive. MSCT of the chest, abdomen and pelvis showed injuries to the lungs, diaphragm, stomach, liver, v. cava inf., right kidney and adrenal gland. Multiple metallic foreign bodies have also been described from the liver with caudal direction and to the right towards the largest, up to 10 mm in diameter, positioned in the right lumbar region.
CONCLUSION: A proper examination by an emergency medicine specialist and an adequate and timely diagnosis enabled the necessary multidisciplinary surgical intervention that allowed the patient to survive.
Key words: Emergency center, penetrating injury, examination.

COMPLEX PATIENTS AND EMERGENCY MEDICINE

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Introduction: It is dogmatically stated that the emergency medical service primarily takes care of acute, life-threatening conditions that require quick intervention. However, the reality in emergency room waiting rooms points to a much more complicated situation. Emergency medical services are facing increasing pressure due to the increasing number of complex patients, whose conditions often involve interrelated medical and social problems. This increase in complex cases goes beyond the capacities and current organizational models of emergency medicine, leading to an overburdened healthcare professional, an increased risk of professional burnout, and a reduced interest in specializing in emergency medicine among new generations of physicians.
Materials and methods: Operational qualitative research in several regions in Croatia, supported by a literature review and recorded demographic trends and modern challenges of health systems in the countries of Europe and North America.
Results: By reviewing the literature, we find that the patients we care for are more complex. 2.7 times more often they come to the emergency hospital, comorbidities occur 2.1 times more often and 1.8 times they use 10 or more drugs.
Conclusion: In the emergency medical service, changes such as an increase in the proportion of the elderly population, an increase in the number of single households and patients with difficulties in performing activities of daily life are becoming more and more visible and significantly burdening daily clinical practice. Addressing the challenges in emergency medical services requires a holistic approach beyond the emergency departments themselves. This includes prevention, better cooperation at all levels of the health system, and the active involvement of patients and their caregivers in care processes. Technological and organizational tools must be aimed at reducing the burden on the system and health professionals, especially in the care of complex patients, in order to ensure the sustainability and efficiency of the emergency medical service.
Key words: emergency medicine, complex patient, long-term care

OBSERVATION OF TROPONIN IN PATIENTS WITH WELLENS SYNDROME

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Wellens syndrome, first explanied in 1980's, is an obstrucion of LAD (left anterior descending) coronary artery mimicking the simptoms of unstable agina. Usually an ECG (electrocardiogram) is enough to set the diagnosis in place, since blood test like troponin, in acute stages, don't show significant increase. In ECG we should always check for inverted T waves in precordial leads, as well to do check-up ECG-s to see its evolution. There are two types of Wellens syndrome: type A with biphasic T wave (25%) and type B with deep inverted T wave (75%). Patients should be admitted to clinical centres and coronary unit as soon as possible to stabilize them and put right diagnostics.
Keywords: Wellens syndrome, ECG, Troponin

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POSTERIOR FOSSA EPIDURAL HEMATOMA IN YOUNG MALE WITH NOONAN'S SYNDROME

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Background: Epidural hematoma is a type of intracranial hemorrhage localized between bones of the skull and dura mater, and it accounts for about 2% of all head injuries. Epidural hematomas localized in the posterior fossa are rare observations and mostly originate from injured dural sinuses. Noonan's syndrome is an autosomal dominant congenital condition associated with cardiovascular and other malformations. Case report: A 22-year-old male who suffered from Noonan's syndrome and thrombocytopenia obtained a severe impact to the back of his head due to a heavy fall that occurred under suspicious circumstances. Immediate surgery was performed, and four days later he died. Autopsy revealed multiple brain contusions and epidural hematoma localized in the posterior fossa. Posterior branch of the middle meningeal artery was identified as a source of bleeding. Discussion: Posterior fossa epidural hematoma is a rare condition with a mortality rate around 13.3%. The most common source of bleeding are injured dural sinuses, but in rare cases, bleeding can be arterial by its origin. Noonan's syndrome is a rare autosomal dominant congenital condition associated with various malformations. It is associated with numerous cerebrovascular malformations and hemostasis disorders, which we believe were of great significance for the fatal outcome in this young male. Conclusion: We believe that the injuries he suffered are inconsistent with the intensity of the force applied during the fall from his height. The congenital condition he suffered from made him particularly vulnerable to trauma and affected the fatal outcome.
Keywords: posterior fossa epidural hematoma, epidural hematoma, Noonan's syndrome, autopsy

PRELIMINARY DATA FROM THE ACUTE POISONING REGISTRY IN THE EMERGENCY DEPARTMENT OF UNIVERSITY HOSPITAL CENTRE ZAGREB

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Patients with poisonings are not frequently encountered in the emergency department, and their recognition and treatment pose significant challenges for clinicians. Patient presentation is influenced by various factors, with the type and amount of the toxic substance being key. Recognizing toxidromes is essential for diagnosing and treating intoxicated patients. In addition to specific and non-specific treatment measures, symptom management is crucial.
The lack of comprehensive registries is a notable issue in emergency medicine. To address this, the Emergency Department (ED) of the University Hospital Centre Zagreb (UHC Zagreb) has established an Acute Poisoning Registry. This registry aims to analyze demographic and clinical data of poisoned patients. Initial data includes information on 140 patients over a six-month period treated for various types of poisoning, divided into five categories based on the type of toxic substance.
Intoxicated patients accounted for 0.8% of all patients in the ED. The most common poisonings were due to alcohol (47.8%) and psychotropic drugs (18.1%). Addictive substances and other poisonings were equally prevalent, while poisonings from other (non-psychotropic) drugs were the least common. Among psychotropic drugs, benzodiazepines were the most frequent cause of poisoning, making them the second most prevalent substance in this population. Most poisonings were intentional and had a mild clinical course with favorable outcomes.

As toxicology is often an overlooked area in emergency medicine, we believe this registry will provide clear data on the extent of poisoning in the largest emergency department in Croatia and significantly contribute to the advancement of the field.
Keywords: emergency medicine, registry, toxicology

PRESENTATION OF DE NOVO CASES AND CASES WITH PRE-EXISTING CHRONIC HYPERTENSION IN DIFFERENT TYPES OF HYPERTENSIVE CRISES

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INTRODUCTION: Hypertensive urgencies typically manifest with nonspecific symptoms since there is no damage to vital organs, in contrast to hypertensive emergencies, where organ damage causes specific symptoms. Exceptions can pose problems during triage. The aim of this study was to present the differences in clinical presentation between de novo cases and those with pre-existing chronic hypertension. MATERIAL AND METHODS: The retrospective analysis included 305 consecutive patients with hypertensive crises who presented to the Emergency Medicine Clinic of the Clinical Center of the University of Sarajevo over a period of six months. RESULTS: Patients with pre-existing chronic hypertension were more numerous (85.57%) than de novo cases (14.43%). De novo cases did not statistically differ from patients with a history of hypertensive crisis in the frequency of presentation with specific symptoms in the hypertensive urgency group (p=0.35). There were no asymptomatic patients with de novo disease, while approximately one-fifth of patients with pre-existing chronic hypertension were asymptomatic (20.1%). De novo patients statistically presented more frequently with nonspecific symptoms in hypertensive emergencies compared to other group (p=0.018). CONCLUSION: Patients with de novo hypertensive crisis more often present with milder symptoms, but never without symptoms. In hypertensive emergencies, they more frequently present with nonspecific symptoms, which can lead to misdiagnosis, especially in prehospital conditions where complete diagnostic assessment is not possible.
Key words: de novo, previous hypertension, symptoms

RESUSCITATION OF A CARDIAC ARREST PATIENT – ER OF THE SARAJEVO CANTON

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On January 20, 2023, at 1:36 a.m., a dispatcher reported that the patient V.Z. (born 1962) was experiencing severe spinal pain. Medical history: radiculopathy, no other known conditions. Due to persistent pain despite medication, the team was dispatched.
Upon arrival at 1:42 a.m., V.Z. was found unconscious. Airway was opened, and breathing checked within 10 seconds—no breathing, cyanotic skin, without central pulse. CPR (30:2) was started immediately. VF appeared on the monitor. Defibrillation with 150 J was performed, followed by continued CPR. The patient received 500 ml of 5% glucose IV and adrenaline (1:10,000).
After two minutes, PEA appeared on the monitor, and CPR continued. A second dose of adrenaline was administered, and VF returned. A 200 J defibrillation was performed, leading to sinus rhythm at

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approximately 75 bpm with wide QRS complexes, but the central pulse was weak. Pulse was lost, and VF reappeared.
Resuscitation continued with adrenaline, and VF recurred. Defibrillated with 200 J, again, resulting in VT with a pulse. The patient received 300 mg of amiodarone. Atrial fibrillation with a ventricular rate of 207 bpm and inferior lateral ST elevation followed.
The patient was intubated, given 10 L of oxygen, and 150 mg of amiodarone in 250 ml of 5% glucose. Transported to the ER at 2:13 a.m. with vital signs, BP 120/60, PP 80, GL 12.3, 10 bpm, 97% saturation, the patient was stable on admission at 2:23 a.m.
Diagnosis: Cardiac arrest due to VF, ROSC achieved.

THE PATIENT IS ON FIRE: SYNTHETIC CATHINONE INTOXICATION

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A 35-year-old individual was admitted to the emergency department after experiencing an epileptic seizure, profuse sweating, and agitation following the ingestion of an unidentified substance. While in the emergency department, the patient displayed extreme restlessness and was administered ketamine for sedation, followed by intubation due to hemodynamic instability and altered consciousness. The patient also exhibited a body temperature of 41.5°C. Cooling measures were initiated in the emergency department and continued in the intensive care unit. Despite these interventions, the patient developed severe rhabdomyolysis, acute kidney injury, acute liver failure, and disseminated intravascular coagulopathy. After ten days of intensive care and supportive treatment, the patient's condition stabilized, leading to discharge after a twelve-day hospital stay. Urine and blood toxicological analysis for conventional drugs yielded negative results, while GC-MS analysis suggested potential poisoning with synthetic cathinone. This case report aims to investigate the toxicity of synthetic cathinone, with a particular focus on hyperthermia, which may, although not in this instance, lead to fatality, as well as strategies for promptly reducing body temperature in patients exhibiting sympathomimetic toxidrome.
Keywords: emergency department, toxicology, hyperthermia, synthetic cathinone

THE ROLE OF KETAMINE IN EMERGENCY MEDICINE- IS THERE ANYTHING NEW

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Ketamine hydrochloride is a nonbarbiturate dissociative anesthetic with a wide range of applications in emergency medicine. It is a noncompetitive N-methyl-D-aspartate and glutamate receptor antagonist that blocks HCN1 receptors. Recent studies have shown that ketamine while providing two alternatives to rapid sequence intubation (RSI), delayed sequence intubation and ketamine-only breathing intubation, should be strongly considered as a default induction agent in critically ill patients over etomidate. Bayesian meta-analysis (Koroki et al., 2024) based on randomized controlled trials comparing ketamine to etomidate in critical patients reported a moderate probability that induction with ketamine is associated with a reduced mortality risk. Kotani et al. (2023) found a 3% increased mortality associated with etomidate. Procedural sedation for critically ill patients is very

challenging. As one of the possible therapeutic choices, the combination of midazolam and ketamine - "MidaKet" - is becoming increasingly used. This strategy involves three steps: titration of midazolam to moderate sedation (3-5 mg IV bolus, additional doses of 2 mg every 2-4 minutes), addition of ketamine to deepen sedoanalgesia (50 mg, additional doses of 25-50 mg every 2 minutes), maintenance of adequate sedoanalgesia (ketamine 25-50 mg, midazolam 1-2 mg). With awareness of its side effects and limitations of use, ketamine has more and more indications for use in emergency medicine based on data from new studies.
Key words: ketamine, emergency medicine, rapid sequence intubation, sedoanalgesia

UNCOMMON ETIOLOGIES OF ABDOMINAL PAIN IN PEDIATRIC PATIENTS

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Introduction. Acute abdominal pain is one of the most common complaints in pediatric population. The key to distinguishing underlying causes is a detailed history, full clinical examination, and carefully selected investigations. Ultrasound is a valuable method in discerning causes of acute abdominal pain. In acute settings an emergency physician's way of thinking (thinking of rare, dangerous causes, and excluding them toward more common, benign conditions) should be implemented.
Methods. A thorough search of PubMed database and literature. Terms: "Abdominal Pain"[MeSH Terms] AND ("Autoimmune Diseases"[MeSH Terms] OR "Genetic Diseases, Inborn"[MeSH Terms] OR "Metabolic Diseases"[MeSH Terms]) AND ("Child"[MeSH Terms] OR "Pediatrics"[MeSH Terms]).
Results A total of 235 case reports were reviewed for the period from 1990 – 2024.
Discussion IgA vasculitis is triggered by an abnormal immunologic response possibly linked to certain HLA genotypes. Gastrointestinal symptoms may precede skin changes. In females of reproductive age, ruling out ectopic pregnancy must be considered. Duodenal hematoma can occur due to a diagnostic procedure, blunt abdominal trauma, coagulopathy disorders, and leukemia. Testicular torsion can be accessed with cremasteric reflex and TWIST score. Acute non-calculous cholecystitis may co-occur with immune-related disorders, but also occurs in critically ill patients and post-surgically.
Conclusion. Abdominal pain in children, although mostly caused by common pathology and conditions, can present a significant diagnostic problem. Physicians must be aware of rare causes of abdominal pain and include them in differential diagnosis.
Key words: Ultrasound, emergency, rare, acute

WHAT MECHANISM OF INJURY IN CHILDREN CAN TELL US ABOUT INJURY

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Trauma is the leading cause of death and serious sequalae in children and adolescents. Understanding the mechanism of injury is very important as it may direct diagnostic work-up and treatment because some mechanisms are related to certain types of injury. Also, thorough analysis of mechanisms of injury may lead to development of effective prevention programs to decrease the incidence of injuries.

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The most common causes of injuries in childhood are falls, traffic accidents, sports, burns and inflicted injuries in violence and child abuse.
Factors of interest in falls are the height (ground level, <1m, 1-3m, >3m) characteristics of contact surface and part of the body that absorbed impact. An important sign is the handlebar sign in upper abdomen, after falls of bike as it may be indicative of pancreas injury.
Traffic accidents are frequent in all age groups and are the most common cause of death. In children <3 years they usually occur in yards, parking lots and farms while older children may be injured as passengers in car accidents, pedestrians, motorcyclists and bicyclists or in the other ways. Seatbelt sign, Waddel's triade and Chance fracture are indicative for traffic accident injuries.
Burns may be caused by contact with hot surfaces, liquids and gases, as well as electrical current, chemical agents and irradiation. Particular attention should be paid to signs of inhalation burns.
In fighting sports brain concussion and contusion may occur, while in contact sports strains, sprains, fractures and dislocations are common. Parenchymatous organ injuries and hollow viscus injuries may be expected as well. There is an increased incidence of ACL and meniscal injuries among young athletes.
It is of highest priority to recognize injuries sustained in child abuse and violence as our legal and moral obligation is to trigger preventive and protective measures. Certain patterns of bruises, burns and fractures are indicative for child abuse. There is increase in incidence of stab wounds in peer violence.

SIGNIFICANCE OF THE DISPATCHER IN EM SYSTEM

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Introduction: Dispatcher in emergency medical service is a healthcare professional, mostly MD, with the important role of collecting information related to emergency medical care, patient assistance and instruction before the arrival of field crew, sending and supporting EMS teams. To perform the work of dispatchers in the majority of countries requires having a certain certificate, which is acquired through education at the national dispatching academies and other education. Serbia still don't have specific education program for work as a EMS dispatcher
In this paper, we wanted to emphasize the development of the EMS dispatchers in the world. Materials and Methods: Retrospective analysis of the literature.
Dispatchers have always played an essential role of emergency medical services (EMS). At its most basic, the role of the dispatcher has been to identify the problem and the location of the patient, and then identify an ambulance that can be sent to the location. Prior to the professionalization of emergency medical services, this step in the process was often informal; the caller would simply call the local ambulance service, the telephone call would be answered (in many cases by the ambulance attendant who would be responding to the call), the location and problem information would be gathered, and an ambulance assigned to complete the task. The ambulance would then complete the call, return to the station, and wait for the next telephone call.
Indeed, during the 1950s the presence of radio dispatch was often treated as marketing inducement, and was prominently displayed on the sides of ambulances, along with other technological advances, such as carrying oxygen. Dispatch methodology was often determined by the business arrangements of the ambulance company. If the ambulance were under contract to the town, it might be dispatched as an 'add-on' to the fire department or police department resources.
In most modern EMS systems, the emergency medical dispatcher (EMD) will fill a number of critical functions. The first of these is the identification of basic call information, including the location and

telephone number of the caller, the location of the patient, the general nature of the problem, and any special circumstances. In most EMS systems, the telephone remains almost a singular point of access for those needing assistance.

The first such triage protocol appeared in 1975, the Fenix. Since then, they have developed a Medical Priority Dispatch System (MPDS), APCO (EMD) and PowerPhone's Total Response Computer Aided Call Handling (CACH) system. The first systems were initially quite simple. Development of a system in which information to the medical team comes prior to arriving at the scene and continues further, and other medical teams called for the first line of emergency can arrive in the best of cases within the first 8 minutes of the call. Well educated dispatcher unlike team can provide guidance in the first seconds of the call. It was developed Dispatch Life Support.

Conclusion: The development of dispatching systems largely depends on the development of electronic devices. The need to more adequately respond to the needs of patients has influenced the development of dispatching centers. Knowledge of how dispatcher systems function in the world will affect the decisions in which direction to go in the development of dispatching centers in our country.

Keywords: dispatching center, development