

Chapter 1 : Advances in Emergency Medicine – An Open Access Journal

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EM has received increased recognition by the national government the past few years with the accreditation of training positions through the Medical Council of India and the National Board of Examinations. This meeting attracted over 1, delegates both nationally and internationally. The importance of this meeting was highlighted by the advancement of clinical research now being conducted by EM physicians across India. Over abstracts were submitted, and fourteen of the top papers from the conference are presented as a supplement in this journal. As the specialty develops, new concerns are being raised and brought to the forefront. Many of these issues are widespread to emergency medicine globally, but many are also matters that are endemic to India and can now be addressed. Emergency physicians are becoming more involved in the planning and protocols involved in the transport of critically ill patients by medical providers. The abstract by Bharati, Taraphdhar and Choudhary shows the need for more regional centralization of pre-hospital services to provide better care for patients. Taraphdhar and Reddy present the efficacy of using Isoprenaline for patients in complete heart block who are transported by ambulance. Abstracts by Radha and by Ahuja, et. Shankar and Mohanasundaram compare the effectiveness of Ketamine and Propofol versus Fentanyl and Propofol as induction agents for rapid sequence endotracheal intubations. Mass gathering events India has a long history of large public events from political rallies to religious festivals, but sporting events are bringing a new complexity with civilians being active participants in events such as marathons. Communicable diseases and sepsis Indian Emergency Physicians have experience treating malaria, TB, and respiratory diseases, but the abundant use of antibiotics that are readily available without prescription in many pharmacies has led to an alarming increase of antibiotic associated diarrhea. Shah et al, document the effect of Clostridium difficile diarrhea in patients presenting to the ED. In addition, early treatment of patients with sepsis requires rapid identification of severe disease and potential markers to predict outcomes. Diagnosis of acute cardiac causes for chest pain is a global challenge for all Emergency Physicians. Sharma et al describe the difficulty of identifying Myocardial Infarctions in patients less than 40 years of age. Because of its complex environment, providing safe and high-quality patient ED care remains an ongoing challenge. Mallick et al present a prospective study that evaluates the sensitivity of a clinical decision tool for the safe discharge of patients from the ED. Of the 14 papers presented here, most of the research studies were done at institutions that train EM physicians. This finding once again reiterates the need for the expansion of academic departments and training programs in India to meet the enormous demand for high-quality emergency care within the country.

Chapter 2 : Advances in prehospital trauma care

Emergency medicine is a branch of medicine that is practiced in a hospital emergency department, in the field by emergency medical service, such as paramedics, and other locations where initial medical treatment of illness takes place.

This article has been cited by other articles in PMC. Abstract Prehospital trauma care developed over the last decades parallel in many countries. Most of the prehospital emergency medical systems relied on input or experiences from military medicine and were often modeled after the existing military procedures. Some systems were initially developed with the trauma patient in mind, while other systems were tailored for medical, especially cardiovascular, emergencies. The key components to successful prehospital trauma care are the well-known ABCs of trauma care: Establishing and securing the airway, ventilation, fluid resuscitation, and in addition, the quick transport to the best-suited trauma center represent the pillars of trauma care in the field. While ABC in trauma care has neither been challenged nor changed, new techniques, tools and procedures have been developed to make it easier for the prehospital provider to achieve these goals in the prehospital setting and thus improve the outcome of trauma patients. The treatment that patients receive in the field can significantly alter their outcome. Prehospital Emergency Medical Service EMS systems rely on advances in therapy and management, often developed for patient care in the hospital setting, but over time, has reached prehospital care providers. All modern EMS systems still follow this early idea of either bringing the physician to the patient or bringing the patient to the physician. Civilian systems were often developed for specific patient groups such as trauma patients or patients with myocardial infarction. Nevertheless, these prehospital systems were responsible for all emergency patients and had to be staffed and equipped accordingly. In Germany, a surgeon developed the first physician based EMS system in Heidelberg with the idea to bring not just a surgeon, but a whole operating room and its staff to the scene of an accident. The trauma patients did not require surgery, but rather stabilization, at the scene. In the same year, the city of Cologne introduced a similar system. Using a much smaller vehicle driven by a firefighter, one physician attended the scene of the accident and transported the patient back to the hospital. Consistent with this, surgeons played a large role in the initial setup of these systems. The first ground-based paramedic systems in the US are often attributed to an article from Ireland in by Frank Pantridge and John Geddes, published in the Lancet. The unit was staffed with personnel from the cardiac intensive care unit and a junior physician. Following this article, physician staffed mobile intensive care units were introduced in New York and Charlottesville. This setup provides first responders with very basic training to perform early simple techniques such as chest compressions, automatic defibrillation or basic airway management until advanced interventions can be performed by either paramedics or emergency physicians at the scene. Some countries like Germany and France are still using EMS systems which are based on the idea of bringing the physician to the patient. The transport to the hospital comes second in this concept, as patients often undergo prolonged treatment at the scene. On the other hand, EMS systems in the US are based on the premise of bringing paramedical providers, who are trained to perform a limited number of medical procedures in the field to the patients. The emphasis is focused on rapid transport to the hospital, after the basic rescue techniques, such as airway management and fluid resuscitation, were performed at the scene. All EMS systems have been undergoing changes over the years. The care of trauma patients is significantly influenced by military conflicts. While the Korean and Vietnam wars saw the first airborne rescue missions by helicopters at a large scale, the civilian EMS systems quickly implemented this new concept into the rescue of civilian trauma patients. Recent changes in military field medicine, such as low volume resuscitation, the revival of tourniquets, and of blood stopping granules, will clearly influence the care of civilian trauma patients in the future. The aim of this article is to give a brief overview of the advances in military and civilian EMS systems which are currently happening and which will affect the way trauma patients are treated, both in the field and in the emergency rooms receiving these patients. The airways of severely injured patients need to be secured as soon as possible. Airway management in the field is often more difficult than intubations in the operating

room or the emergency department. This is caused by different provider training and experience, patient location, and coexisting medical or surgical problems. Over the years, different devices used in anesthesiology have been introduced to prehospital care providers. These devices range from laryngoscopes and different laryngoscope blades to oral and nasal airways. More recently introduced devices include the Eschmann elastic bougie, and even more recently, supraglottic devices. The Eschmann or gum elastic bougie has been used by anesthesiologists, especially in Europe, since its introduction by Macintosh in 1971. In a cadaver study, the bougie was placed through an LMA and an endotracheal tube ETT was then placed over the bougie. This technique shows good success rates amongst providers otherwise inefficient in intubation with direct laryngoscopy[27] as a backup intubation tool after the other intubation attempts have failed,[28 , 29] or in cases of difficult airways, such as limited access to the patients airway. So far, most publications of video-assisted laryngoscopes include case reports in trauma patients[33] and mannequin simulations,[34] but not randomized trials. Nevertheless, these studies have shown that the success rate and speed of intubation with video laryngoscopy is comparable in providers, experienced with direct laryngoscopy, due to a steeper learning curve with the video laryngoscopes. Video-assisted devices have shown to reduce cervical spine movement in comparison to direct laryngoscopy. While the video-assisted laryngoscopes offer advantages over direct laryngoscopy for difficult airways and for providers with minimal training or experience, they also provide the disadvantage of providers losing their skills in direct laryngoscopy, therefore giving up a time-honored and proven technique to intubate a patient. Nevertheless, given the low national requirement of intubation for new paramedics, we will very likely see a widespread use of video-assisted devices in the prehospital systems. This will hopefully reverse the current trend of abandoning prehospital intubation due to the lack of intubation skill in some paramedics. The need to administer fluids and medication makes circulatory access essential. In certain patients such as hypovolemic patients, intravenous drug abusers, burn patients, and children, peripheral intravenous access may not be possible. While the concept of intraosseous access is quite old and has been used for pediatric patients for a long time, only recently this technique was introduced to the adult patients. The technique is supported by the European Resuscitation Council and has shown comparable plasma concentrations of injected drugs, similar to injection through a central venous catheter. The mechanical devices Bone Injection Gun, FAST 1 showed to be equivalent in terms of success rates as compared to standard intraosseous needles, but differed in the time required to secure circulatory access. This means that once at the hospital, the patient still requires intravenous access and the intraosseous needle or needles needs to be removed. For this reason, intraosseous access is often used as a last resort when peripheral IV access can not be established and central venous access is not possible either. Central venous access has been used in some prehospital systems, but has a higher risk of serious side effects and complications compared to peripheral IV access. The most common risks are pneumothorax, vascular injury, and infection. For reasons of infection control, all the lines placed in the field need to be considered contaminated and should be replaced at the earliest possible time. **BLEEDING CONTROL** Tourniquets are experiencing a revival after they were all but eliminated in the early 80s when the fear of extended soft tissue damage, nerve damage and the potential loss of the extremity was feared if the tourniquet was used for too long or was not indicated in the first place. The different injury pattern experienced by the US military in the latest conflicts in Iraq and Afghanistan showed that tourniquets save lives in cases of severe blast injuries to the extremities. These findings even translated into tourniquets built into tactical gear by some manufacturers. While these types of injuries are less frequently encountered in the civilian EMS systems, there has been a change of policy regarding tourniquet use in many civilian EMS systems. The different types of tourniquets rubber, cloth, and windlass are successful in eliminating distal pulses when applied above and below the knee or elbow. Accurate documentation regarding time of tourniquet application is necessary with their use. Other forms of hemorrhage control include advanced hemostatic dressings where a clotting agent is impregnated into the dressing and granular agents. Examples of hemostatic dressings are: Two examples of granular agents are Celox and WoundStat. HemCon is a positively charged chitin-based wafer which bonds strongly with negatively charged blood cells upon contact. Military comparisons of these agents show better control of hemorrhage in swine models. But the success is limited in critically ill or unstable patients. A further

indication is the assessment of effectiveness of cardio pulmonary resuscitation CPR , as larger volumes of end-tidal CO₂ indicate not only effective ventilation but also better cardiac output. Furthermore, correlation with PaCO₂ should be obtained as soon as possible, which usually occurs shortly after arrival at the receiving hospital. Other devices, such as the single use colorimetric end-tidal CO₂ detectors, are still used frequently. One must remember that these devices are of single use and early exposure to ambient air prior to their use can render them useless. These devices can be removed from the breathing circuit as soon as confirmation of tube placement is made. A new development in patient monitoring is the transcutaneous measurement of tissue hemoglobin oxygenation. Unlike other monitoring devices, the tissue hemoglobin oxygenation measurement has already found access to the prehospital field and seems to give the prehospital provider a tool to assess hypoperfusion in the field. There are trauma courses for medics including firefighters , nurses, and physicians. Some trauma courses conducted in North America are as follows: It is very important in trauma management systems for all participants to be fluent in order to provide the best care for patients. The use of muscle relaxants in patients undergoing ETI facilities and improves the success rate of intubation. In the prehospital setting, the use of muscle relaxants for rapid sequence intubation RSI was first described by Hedges in To safely use these potentially dangerous medications, advanced airway training is needed and has been proven to be effective in improving intubation success and decreasing cricothyroidotomy rates when implemented. The training of new students or medical residents has been undergoing numerous changes over the last years. The most recent development is the use of simulation programs in which the student is exposed to real-life scenarios and realistic time constrictions. The idea of the simulation is to give the student not just vital parameters or other physiologic data, but also to mimic real scenarios including interaction with patients and other team members. These simulations were first used in the training of anesthesiology residents and first described in Other medical specialties and paramedic training programs have been using simulation-based learning. Simulation is a means where difficult, and sometimes rare, events can be reproduced in a safe setting. Participants can then get multiple exposures to scenarios which occur infrequently. Studies indicate that simulation-based learning programs improve crisis management skills, especially behavioral skills, necessary in the team approach to injured patients. This training requires substantial resources and clinical opportunities, which may not be available to many training programs. The purpose of these scores is to predict and identify the most critical of patients and guide with patient transport to the appropriate hospital. It has been shown that organizing a prehospital advanced life support system in combination with the transport of the patient to the most suitable hospital decreases the mortality of trauma patients. This result is attributed to improved quality of care and reduced time to definite treatment. The AIS underwent a total of six revisions. The current AIS dictionary lists approximately injuries. The AIS is commonly used to assign monetary values to injuries for cost-benefit analysis. More current scores such as the Revised Trauma Score RTS look at physiologic data, but are often cumbersome to calculate. This scoring system looks at variables in the following settings: Logistic regression of these variables showed that in the prehospital phase, age, blood pressure BP , heart rate HR , GCS, and anisocoria were the significant survival predictors. Compared to other trauma score systems, the STS is collecting data from numerous data points to predict patient survival at different stages.

Chapter 3 : Advances in Pediatric Emergency Medicine | Children's National

Advances in Emergency Medicine is a peer-reviewed, Open Access journal that publishes original research articles, review articles, and clinical studies in all areas of emergency medicine.

Chapter 4 : Emergency Medicine Cardiac Research and Education Group (EMCREG-International)

Research in the Department of Emergency Medicine at the Medical College of Wisconsin is both nationally and locally funded. Our Research Director, E. Brooke Lerner, holds a PhD in Epidemiology and is nationally recognized EMS researcher.

Chapter 5 : Stanford Emergency Medicine: Academic EM Faculty and Vice Chair of Research Openings ()

Summarize advances in the diagnosis and treatment of appendicitis in the pediatric population. Review recent articles in the literature that are relevant to pediatric emergency care. Understand the threat of emerging infectious diseases in the pediatric population.

Chapter 6 : The Journal of Emergency Medicine - Elsevier

Vice Chair of Research. The Department of Emergency Medicine at Stanford University seeks a board-certified Clinician Researcher to join the Department as an Associate or Full Professor in the Medical Center Line for the title of Vice Chair of Research.

Chapter 7 : Advances in Medical Research

Over the past several years, EMCERT has become more diversified in their support of emergency medicine by supporting technologic advances in advanced airway management, purchasing medical simulation equipment, AEDs for community organizations, and providing seed funding for a joint reduction simulator, development of new research for education.

Chapter 8 : Emergency Medicine | Resident Research | Medical College of Wisconsin

Within India, Emergency Medicine (EM) is a rapidly evolving and expanding specialty. EM has received increased recognition by the national government the past few years with the accreditation of training positions through the Medical Council of India and the National Board of Examinations. These.

Chapter 9 : Emergency cardiology: Challenges, controversies, and advances – Mayo Clinic

The International Journal of Emergency Medicine is a high-quality Open Access journal which aims to bring to light the various clinical advancements and research developments attained over the world, thus helping the specialty forge ahead.