



EMERGENCY MEDICAL TECHNICIAN WITH PHYSICIAN IN ASSESSING CRITICAL TRAUMA, ROLE OF FAST IN EMERGENCY ROOM

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Abstract:

One of the leading causes of death that may be attributed to trauma is intra-abdominal bleeding, which can be caused by blunt abdominal trauma. Therefore, any action performed to facilitate the detection of intra-abdominal bleeding might potentially save the lives of patients in a more efficient manner. Ambulance paramedics are an essential component in shortening the time it takes for patients to get emergency medical care. There has been an increase in the accuracy and speed of information transfer as a result of standardized handover communication frameworks; nevertheless, it is not apparent how these frameworks will affect situations that are time-sensitive. The presence of paramedics who remain for a short period of time following the handover in order to provide assistance with shared patient care may result in improved patient outcomes.

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Introduction:

It is still the case that major trauma is the leading cause of mortality at an early age in developed nations. The number of deaths and permanent disabilities that occur as a result of severe injuries is growing in nations with poor incomes, and this trend is expected to continue with increasing frequency [1]. Around five million individuals all around the world lost their lives as a direct result of injuries in the year 1990. Suffering an injury is the top cause of mortality among those who are less than 35 years old. Despite this, the worldwide epidemic of in-jury is only getting started. On average, 8.4 million people will have died as a result of injuries by the year 2020 [2].

The patterns of injuries that occur in Europe and the United States are very different from one another. It is still the case that the vast majority of fatalities in Europe are caused by injuries sustained on the road, namely blunt force trauma. According to the findings of a survey conducted in Scotland, the total frequency of deaths that occurred as a consequence of injuries caused by blunt trauma was 93% [6]. On the other side, in certain states in the United States, the number of deaths caused by penetrating injuries, such as gunshot wounds, has surpassed the number of deaths caused by motor vehicle accidents. There are a variety of processes that can cause trauma, each of which contains the potential to cause significant dangers for trauma patients and may need the use of different treatment procedures [3].

The use of focused assessment with sonography in trauma (FAST) scanning has been a significant contributor to the quick non-invasive evaluation and subsequent care of patients who have suffered thoracoabdominal trauma ever since it was first introduced in the 1990s. Compared to other imaging modalities that are available for trauma evaluation, there are a number of significant benefits that are well acknowledged. As a result of the evolution of FAST, it has been incorporated into the Advanced Trauma Life Support (ATLS) training courses offered by the American College of Surgeons. Additionally, it is presently being utilized by emergency doctors in resuscitation rooms all over the world to aid in the process of making quick decisions [4].

In the high-pressure setting of the emergency room (ER), how quickly and accurately trauma evaluations are performed can be the deciding factor in whether or not a patient lives or dies that day. For many years, medical professionals have depended on a variety of diagnostic techniques to quickly evaluate trauma patients, particularly in

cases where the patient's life is in danger. Ultrasound, and more specifically point-of-care ultrasound (POCUS), has emerged as an important device among these techniques because it provides a real-time, non-invasive method of evaluating injuries. The application of ultrasound in trauma evaluations involves a wide variety of circumstances, each of which plays a significant role in assessing the nature and severity of injuries [5].

Review:

When it comes to patients who present themselves as medical crises, evidence-based care standards place an emphasis on the significance of early detection, appropriate conveyance, and coordinated treatment [1]. The importance of this cannot be overstated when it comes to optimizing outcomes for illnesses that require time-sensitive therapies, such as trauma, myocardial infarction (MI), and acute stroke [2]. The provision of speedy pre-hospital evaluation, triage, and the acceleration of access to these emergency therapies are all important responsibilities that ambulance-based paramedics are responsible for. On the other hand, a study of twenty-one clinical handover studies indicated concerns regarding the quality of communication and information sharing between pre-hospital and hospital workers, particularly when time constraint is present as a result of service demands [2,4]. It has been demonstrated that structured handover frameworks can increase the accuracy and speed of information transmission between paramedics and emergency department (ED) staff [5]. However, it is not known if condition-specific versions could further improve treatment and health outcomes for conditions that are time-critical.

It is possible that patient outcomes could be improved even further in clinically complex situations if paramedics and/or emergency medical technicians continued to actively contribute to care alongside the emergency hospital team for a limited amount of time after handover. For example, they could assist with airway management or intravenous access. Paramedics do not regularly continue to be a part of the continuing care of patients in the emergency department, coronary care, stroke unit, or any other suitable specialty treatment facility in secondary care after the transfer of basic clinical information. On the other hand, they could have the necessary abilities at a time when the hospital staff might be dealing with conflicting demands, which could be an additional factor that contributes to the speedier availability to emergency therapies. In order to achieve optimal

health outcomes, it may be necessary to design improved clinical roles that go beyond the limitations that have traditionally been established [6].

The diagnosis of cardiac trauma poses a one-of-a-kind set of complications due to the complex nature of the anatomy of the heart and the vital function it plays in the circulatory system. In addition, the intricacy of cardiac ailments, in conjunction with the pressing need to provide appropriate therapies, calls for diagnostic approaches that are both exact and quick. When seen in this light, ultrasonography guidance emerges as a very helpful resource for emergency room practitioners. To be more specific, the extended Focused Assessment with Sonography in Trauma (eFAST) protocol has become more popular as the method of choice for the initial assessment of suspected cardiac damage in patients who have been injured in a trauma situation [6].

In addition, the detection of pneumothorax is yet another component of trauma evaluation in which ultrasonography has the potential to play a significant role. The medical emergency known as pneumothorax, which is defined by the buildup of air in the chest cavity leading to lung compression, requires prompt identification and management due to the severity of the condition. In order to emphasize the relevance of thoracic ultrasonography in the diagnosis of pneumothorax, the Eastern Association for the Surgery of Trauma has granted a level 2 recommendation for its utilization in this diagnostic procedure. For the purpose of providing a prompt examination, the FAST test has been created as the standard of care under certain circumstances. Furthermore, the extended FAST (eFAST) technique contains the ability to explicitly identify the presence of pneumothorax. This is a significant advancement. The diagnostic potential of ultrasound was revealed in a retrospective review that was carried out at a level I trauma center and published in *American Surgeon* in 2015. The review demonstrated that ultrasound has the ability to predict the absence of pneumothorax with remarkable sensitivity and a remarkable negative predictive value when compared to chest x-ray [7].

Blunt abdominal trauma is a crucial and deceptive scenario that generates a variety of signs and symptoms, ranging from trivial symptoms to severe shock. It also leads to a greater risk of death due to the difficulties in recognizing the damage to intra-peritoneal organs [8]. All of these signs and symptoms can be caused by blunt abdominal trauma. Because the mental state of individuals who have been through traumatic experiences is

typically altered, the outcomes of physical examinations are frequently erroneous. Diagnostic peritoneal lavage (DPL), which is an invasive technique, offers information about the presence or absence of peritoneal fluid. However, it lacks specificity and does not provide information about any possible injury to the muscles and organs that are located within the abdominal cavity. At the same time that it is essential for emergency physicians to determine who should approach a blunt abdominal trauma, they must rely on a physical examination or perform diagnostic procedures, such as FAST ultrasonography, diagnostic peritoneal lavage (DPL), or computed tomography (CT), in order to determine which patients require any kind of therapeutic intervention. In spite of the fact that DPL is extremely sensitive when it comes to recognizing hemoperitoneum and continues to be a helpful tool for excluding hollow organ perforations that may go unnoticed by CT, the utilization of this technique has decreased in recent years due to advancements in imaging diagnostic processes [8]. Contrast abdominal CT is regarded to be the gold standard; nevertheless, it is not the best option for low-risk patients because of its limitations. These drawbacks include the fact that it is expensive, that it takes a lot of time, that it requires the patient to be transferred out of the emergency department, and that it exposes the patient to radiation. FAST ultrasonography is the principal method that is utilized in the majority of institutions for the purpose of determining whether or not there is intra-peritoneal free fluid present in cases of traumatic abdominal trauma. Rapid performance is possible, and it may be carried out in the resuscitation room of the emergency department. Even though the FAST ultrasound has a high level of sensitivity and specificity for hemoperitoneum, it is not possible to rule out the possibility of intra-abdominal injuries that necessitate laparotomy in the event that the FAST result is negative [9].

When compared with radiographic techniques, the specificity and sensitivity of ultrasound evaluation of pneumothorax were shown to be 84.6% and 100%, respectively, in this study. Compared to the findings of other investigations, which have demonstrated respective ranges of 86.2% to 98.1% and 97.2–100%, this is comparable. In two cases of suspected tension pneumothorax, a fast examination with sonography provided weight to the clinical assessment and made it possible to confidently perform rapid decompression and subsequent insertion of an intercostal drain. Ultrasound was used to identify a pneumothorax in one patient, however the chest x-ray did not reveal

the presence of the pneumothorax. Studies that were conducted in the past and compared the x-ray diagnosis of pneumothorax with the ultrasound evaluation of the condition have showed that the ultrasound assessment may be superior. The diagnostic sensitivity of a chest x-ray ranges between 27.6–75.5%, but the specificity of the test is one hundred percent. In addition to this, it appears to be a talent that can be quickly acquired and has been effectively implemented into prehospital care in Europe [10]. Across the threshold of secondary and tertiary care, the role of ambulance-based paramedics was restricted to "direct transportation" of patients to imaging facilities. They did not participate in any further assessment or treatment of the patients. This was typically done in an effort to improve process measures, such as the amount of time it took from the time the patient arrived at the imaging facility to the time they received treatment. However, there is no similar policy push for paramedics to use extra clinical skills during and after handover to hospital workers. Direct transportation is currently a fundamental part of emergency treatment planning in the United Kingdom National Health Service for trauma, stroke, and myocardial infarction. The training of paramedics to utilize standardised communication tools, on the other hand, has been shown to have the potential to be useful in studies that are relevant to the ongoing growth and extension of the ambulance-based paramedic function. This was the primary emphasis of a previous evaluation, which likewise came to the conclusion that there is insufficient evidence to support the use of structured handover tools (that would make use of mnemonics) to enhance communication during handover [11]. However, if generic formats are helpful, then there may be a higher impact from using tailored frameworks that communicate vital information during time-sensitive scenarios. This is consistent with our review, which found that there is still insufficient evidence to make any recommendation regarding condition-specific structured handovers. In a similar vein, condition-specific feedback appears to be of use to paramedics; yet, it is difficult to offer it in a timely and structured manner to a workforce that is scattered and continuously responding to high service demands [11].

Conclusion:

A physician's participation in pre-hospital trauma treatment has not yet been shown to result in a better prognosis for patients who have suffered severe injuries, according to the available available evidence. Nevertheless, this conclusion is equally

prevalent in systems that are based on paramedics. In the event that airway management, volume replacement, and spinal immobilization are discontinued because of the potential for harm they create, there is not much treatment that can be administered anywhere else in the field. The methodologies that have been utilized in the process of developing the present prehospital trauma literature do not allow for the formation of a consensus opinion about the influence that each component of the system has on the outcome of the patient. The research that was found demonstrates that the competences and duties of paramedics are fast developing, and that their direct engagement in the treatment of patients who have crossed the barrier into secondary care in collaboration with hospital professionals has the potential to improve health outcomes. For the purpose of informing the design of cost-effective handover and feedback mechanisms, as well as the health impact that results from increased communication and inter-professional sharing of clinical skills, a "new wave" of study on paramedics is required.

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