

Major Trauma Outside a Trauma Center



Prehospital, Emergency Department, and Retrieval Considerations

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KEYWORDS

- Trauma resuscitation • Prehospital trauma • Retrieval medicine
- Resource-limited environment • Rural hospital • Ultrasound

KEY POINTS

- Incoming Emergency Medical Services crews often have crucial information about trauma mechanism, contributing factors, specific injuries, effect of treatment, key timings, personal details, and more. They also can be an essential extra set of hands in settings with limited resources.
- Set up the resuscitation area for success and know the equipment and team capabilities. Create and rehearse emergency department and hospital procedures for quickly obtaining additional personnel and resources as needed.
- Extensive radiological and laboratory evaluation is often unnecessary and may delay access to definitive care. Only obtain studies that may provide actionable results and improve the course of management. Targeted bedside ultrasound can provide rapid and useful answers with appropriate training.
- An emergency physician must be prepared to provide immediate life, limb, and sight saving interventions when indicated, regardless of the clinical environment.
- Request transfer/retrieval as soon as the need for higher level of trauma care is presumed. A standard preretrieval process (with checklist) can make the transition of the patient out of the emergency department safer and more efficient.

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PART ONE: PREHOSPITAL TRAUMA: CUTTING-EDGE CARE IN THE FIELD

Evolving Practices in Prehospital Care

Prehospital care has evolved significantly from its origins in military conflicts to today's complex Emergency Medical Services (EMS) systems. Highly specialized providers, structured protocols, and a broad scope of practice have contributed to prehospital medicine as a recognized medical specialty.¹ High-quality trauma care begins from the point of first medical contact and continues during transport to local hospitals and ultimately to designated trauma centers. Prehospital medicine is now an area of significant and substantive research that has led to important, patient-centered improvements in processes of care.

Thoughtful use of rigid cervical collars and backboards

Recent evidence suggests there is little benefit for the routine use of either backboard or cervical spine immobilization in trauma. In fact, neither technique provides effective spine immobilization and may result in patient harm through pain, skin breakdown, and complicating airway management.²⁻⁹ Spinal immobilization in penetrating trauma is associated with increased mortality.^{9,10}

Position statements by the National Association of EMS Physicians and the American College of Surgeons Committee on Trauma both recommend attention to spinal protection via "application of a cervical collar, adequate security to a stretcher, minimal movement/transfers, and maintenance of in-line stabilization during any necessary movement/transfer." Additionally, both groups recommend against immobilization for penetrating trauma.¹¹ We anticipate that a selective, rather than "routine" approach to spinal immobilization, will result in fewer patients immobilized without benefit during EMS transport.

Increasing use of ultrasound

Point-of-care ultrasound improves the diagnostic capability of prehospital physicians.¹² Non-physician providers can be trained to accurately obtain and interpret ultrasound examinations, such as the Focused Assessment with Sonography for Trauma (FAST) or examination of the abdominal aorta.¹³ This skill set may improve the ability of EMS teams to assess trauma patients, triage a mass casualty incident, and direct patients to the most appropriate facility.¹⁴ In some EMS systems, FAST examination findings directly impact patient care. For example, a shocked trauma patient with a positive prehospital FAST examination may trigger the administration of prehospital blood administration and be directly transported to the operating room of the receiving institution. Prehospital ultrasound is still in its infancy, and further studies will guide its use and establish its impact on patient outcomes.

Focus on hemorrhage control using strategies derived from combat medicine

Lessons learned from military conflicts have led to substantial developments in trauma management for civilian prehospital practice. Damage control resuscitation (DCR), a treatment paradigm that combines rapid hemorrhage control, minimal crystalloid, and permissive hypotension has become the standard for patients with serious injuries and presumed hemorrhage.^{15,16} Prehospital clinicians can apply DCR principles by limited crystalloid administration, tourniquet application for extremity bleeding, and massive transfusion protocol initiation.¹⁷ The use of blood products in the field is feasible and may improve survival.^{18,19} Many advanced care EMS organizations now carry blood products, including both packed red blood cells and fresh frozen plasma.²⁰ A more detailed review of DCR principles is outlined in the trauma resuscitation sections of this issue.

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