

## Twenty-four Hour Trauma Team at the University Hospital of the West Indies, Kingston, Jamaica – The Time is Now

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### INTRODUCTION

The timely and aggressive resuscitation of seriously injured trauma patients requires rapid assessment and efficient management of the injuries. Over the past thirty years, fatalities from trauma have decreased markedly due to the increased awareness of simple trauma care principles, such as those of the American College of Physicians Advanced Trauma Life Support [ATLS] (1). However, the ATLS approach is designed so that tasks are performed in sequence, one after the other, resulting in a 'vertical organization'. A trauma team employing a 'horizontal organization' has been shown to lead to significant reductions in resuscitation times (2).

Trauma and injury still remain the most common causes of death under the age of 44 years worldwide and the fourth leading cause of death in the western part of the world (1, 3, 4). The Pan American Health Organization reports that trauma is among the five leading causes of hospitalization, and is estimated to represent approximately 20% of hospital admissions in Jamaica (5). In 2000, the Royal College of Surgeons in England published a report emphasizing the insufficiencies in the management of the trauma patient (6). The report recommended the organization and institution of a trauma system and most importantly "the hospital trauma team" (6). Seven years later the United Kingdom (UK) National Confidential Enquiry into Patient Outcomes and Death reported that only 20% of hospitals in the UK had established trauma teams available, and of these trauma teams, only 59.7% of patients with an injury severity score (ISS) greater than 16 had a "documented trauma team response" (4). Studies have shown that even when a trauma team works in isolation outside a designated trauma system, it is still very effective in decreasing overall patient morbidity and mortality (7–11).

The main objective of any trauma care system is to "assure optimal and equitable care for all trauma victims, prevent unnecessary death and disability from trauma, contain cost and assure quality of trauma care throughout the

system" (12). The establishment of a trauma team is central to the fulfillment of this objective. This team should be able to i) resuscitate and stabilize patients, ii) determine the nature and extent of injuries in order to prioritize them, and iii) prepare and transport trauma patients for definitive care, whether to an operating theatre, intensive care unit or to another hospital (13, 14).

The University Hospital of the West Indies sees approximately 56 000 patients annually (15). Trauma accounts for approximately 40% of the workload in both the Accident and Emergency Unit and the surgical wards (16). Between January 2001 and December 2005, penetrating trauma accounted for almost 50% of cases seen (17). These figures are a direct reflection on the probable societal burden and cost of trauma care in Jamaica. One study showed that only approximately 15% of the total cost for each trauma patient is recovered from the patient, making the care of these patients mainly state funded (17). A more efficient trauma care delivery system will therefore lessen the burden injuries place on the health service (16).

The aim of a trauma team is to provide a safe and competent evaluation of a trauma patient within the shortest possible time (2). The following is a proposal to create a functioning trauma team that intends to further decrease preventable deaths utilizing a 'horizontal organization' to enhance significant reductions in resuscitation times and survival.

### THE CONCEPTS

#### The Trauma Team

The ideal trauma team should comprise specialists from emergency medicine, general surgery, anaesthetics, nursing and support staff, who will provide concurrent 'assessment and management' of the trauma patient (13, 14). Too many persons on a trauma team can cause disorganization and breakdown in communication detrimental to the patient (11, 14). Vital to the team efforts is coordination put forward by a team leader. The trauma team leader will ensure that the objectives of the team are fulfilled. This individual should be trained in trauma management and be able to recognize impending problems associated with managing a severely injured patient. The team leader will organize specific tasks for each team member, which include: monitoring vital signs and adjusting management accordingly, determining the likely mechanism of injury and proceeding with definitive treatment where possible, prioritizing investigations, and com-

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municating with specialists as necessary (13, 14). Leadership skills are necessary in order to direct as well as respond to the other members of the team and to show flexibility depending on the team experience level (18–19). Studies have shown that having a trauma surgeon on the trauma team reduces both the ‘resuscitation time and the time to incision for emergency surgeries’; this, however, has not impacted on decreasing overall mortality (14, 20). The trauma team leader is usually an emergency medicine physician, an intensivist-anaesthetist, or a surgeon. There have been no significant differences in length of stay in the emergency department or in actual survival of trauma patients between trauma cases led by surgeons *versus* those led by other trauma team leaders (21–22). However, it has been shown that the more senior the physicians leading the team, the better the team performance (23). The Figure shows a representation of a trauma team and its various tasks.

### Trauma Team Activation and Organization

Many trauma systems around the world use “tiered trauma team response” to trigger activation of their trauma team. This triggering is dependent on the ISS of the injured patient (24–26). The system is dependent on the quick assessment of the mechanism of injury, the severity of the injuries and the patient’s physiological derangement on arrival (26). The existence of a pre-hospital care report is very useful, but not completely necessary as it has been shown that there should be a high degree of ‘over-triage’ in mobilizing the trauma team to prevent ‘under-triage’ as well as any other delays in management of the patient (27–28).

A two-tiered system has been described, where Tier 1 trauma includes all trauma patients with a high likelihood of needing immediate surgical intervention. More specifically, these include (i) penetrating injuries to the neck, torso, groin or extremities proximal to the knee and elbow, (ii) amputations proximal to the wrist and ankle, as well as blunt injuries where the patient is haemodynamically abnormal [defined as sustained hypotension (SBP < 90 mmHg), bradycardia (HR < 60 mmHg), tachycardia (HR > 120 mmHg), ongoing external haemorrhage (*eg* a crushed, degloved or mangled extremity) and a high likelihood of needing a surgical airway] (26). A Tier 1 trauma will activate the trauma team, the trauma staff surgeon, the radiologist on call, as well as notify the operating theatre, the intensive care unit, and blood bank services (26). The Tier 2 trauma includes patients that have sustained significant blunt force trauma with potential for multisystem injuries. Examples of these types of patients are: (i) Glasgow Coma Scale < 14, (ii) intubated patients and mechanism of injury consistent with multisystem trauma, (iii) suspicion for injuries that comprise two or more systems, (iv) flail chest, (v) suspicion of two or more proximal long-bone fractures, (vi) suspicion of depressed/open skull fractures, (vii) paralysis, (viii) facial injuries with potential need for airway management, (ix) blast, explosion or other industrial or recreational accidents with significant

force or velocity, and (x) injuries in the context of a major burn (26). A Tier 2 trauma will activate the trauma team and the radiology technician on call (26). If there is notification of the trauma patient prior to their arrival then the trauma team should be waiting in the emergency room with tasks allocated (13).

### Benefits of a Trauma Team

Benefits of establishing a trauma team are multiple. One study showed that patients with ISS greater than 12 had better patient outcome as well as there were increased numbers of survivors when managed initially by a trauma team compared to management on a ‘service-by-service’ basis (29). Another study showed that overall trauma morbidity and mortality rates were reduced in severely injured patients with ISS greater than 25, who were managed by a trauma team (30). Trauma teams working in isolation have been shown to increase survival rates in hospitals not designated as trauma centres (8). The reasons cited for this are that trauma teams have been shown to decrease the overall times the patient will spend in the emergency department before being transferred to radiology or to the operating theatre (31). In one study done on paediatric trauma, the time to injury diagnosis was reduced ten-fold with the establishment of a trauma team (32).

### CONCLUSIONS

The introduction of a trauma team service to the University Hospital of the West Indies can improve the efficiency in management of a problem that has a high prevalence among young adults. It can also be supported by evidence that it is likely that a trauma team service will decrease overall morbidity and mortality of the severely injured patient. The time is now.

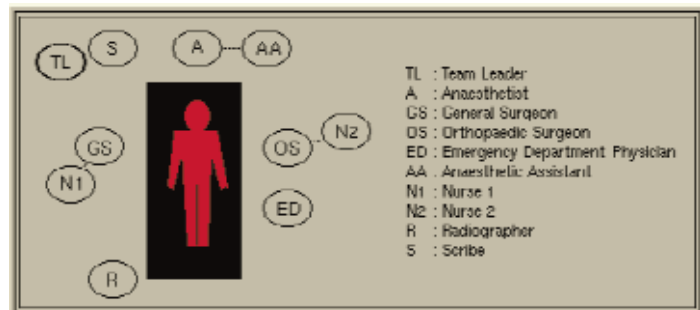


Figure: Representation of the trauma team (2).

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