Lessons From Combat Care Helped Save Lives And Limbs After Boston Bombing

Collaboration across surgical specialties and lessons from combat casualty care—especially the use of tourniquets and other effective strategies to control bleeding—helped mount an effective surgical response to aid victims of the Boston Marathon bombings, according to a special editorial in the July issue of *The Journal of Craniofacial Surgery* [1], which is led by Editor-in-Chief Mutaz B. Habal, MD, and published by Lippincott Williams & Wilkins [2], a part of Wolters Kluwer Health [3].

The experience of surgeons treating victims of the Boston bombings at Brigham and Women's Hospital (BWH) highlights the "intensive surgical resources necessary after a civilian bomb attack," according to the article by Dr. E.J. Caterson and coauthors. They write, "Unfortunately, it is likely that more centers will deal with similar events in the future and it is imperative that we as a community of providers take what lessons we can from battlefield medicine and that we collectively prepare for and engage this future."

'Exceptional Team Effort' in Response to Boston Bombings

Surgeons and staff at BWH mobilized "an exceptional team effort" in treating victims of the horrific terrorist attack at the Boston Marathon finish line. In the wake of the bombing, BWH received 39 bombing victims, including seven critically injured patients arriving nearly at once. The first patient was resuscitated and on an operating table just 18 minutes after arriving at the BWH trauma center, and about 35 minutes after the explosion.

Thirteen patients underwent emergency surgery within the first few hours after the event. BWH surgeons performed a total of 72 surgeries in a total of 181 hospital days, with the most severely injured patients requiring multiple surgeries. In an intensive effort lasting more than a month, surgeons, residents, nurses and other staff volunteered for extra shifts to reduce the backlog of blast-injured Bostonians requiring surgery.

"[F]rom the first moments of hospital care being initiated it was truly a team effort with orthopedic surgery, plastic surgery, trauma surgery and vascular surgery standing shoulder to shoulder in the trauma bays, and together in the operating rooms, Dr. Caterson and coauthors write. They believe that "prepositioned collaborative relationships" among surgical specialties at BWH could provide a useful model of collaboration for responding to mass casualty events—military as well as civilian. With expertise in facial trauma, hand and burn surgery, and wound management, plastic surgeons can play a key role in coordinating surgical care, "with a broad perspective on functional recovery."

Critical Lessons from Combat Care in Response Civilian Casualties

The authors also emphasize the "effective transfer" of the lessons of combat casualty care -- especially the Tactical Combat Casualty Care course [4]that has grown out of the medical experience in Iraq and Afghanistan Wars. Foremost among these lessons was the effective use of tourniquets to control hemorrhage from missing and mangled limbs is potentially lifesaving.

Quick-clotting military combat gauze plays a similar role in stopping bleeding in places where a tourniquet can't be used, such as the neck or groin. For internal bleeding, the blood-clotting drug tranexamic acid is effective. Other critically important techniques include fracture splinting and emergency airway management. "All of these lifesaving lessons should be incorporated into our civilian mindset when we were dealing with casualties of a potential terrorist attack," according to the authors.

"If there is any overarching lesson, it is that multidisciplinary teamwork, preparation and dedication are the keys to success in effectively dealing with a mass casualty event," Dr. Caterson and colleagues conclude. "It is important to perform an assessment of performance after such an event to use and disseminate knowledge to make these attacks less effective by making our responses more efficient and effective."

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