

Section 5

Mass Trauma and Explosive Events

Mass trauma is the term used to describe the multiple injuries, deaths, disability, and emotional stress caused by a catastrophic event, such as a large-scale natural disaster or a terrorist attack. Increasing population density and urbanization, coupled with the propensity for larger buildings, mass transit, and mass gatherings, create the potential for a serious disaster involving multiple casualties.

Across the globe, the threat of terrorism involving the use of explosive agents in urban or otherwise crowded environments has become reality. Bombings are blatant and emphatic, and by their very nature gain immediate public attention. In contrast to natural disasters (which may be forecasted successfully for a particular region), mass traumatic and explosive events are typically not predictable.

Despite widespread concerns regarding biological and chemical attacks, conventional explosives devices are by far the most commonly used terrorist weapons because they are the easiest to create, obtain, and use. The medical consequences from the detonation of a conventional explosive include death and acute injury, as well as destruction of critical infrastructure such as buildings, roads, and utilities. Victims trapped in collapsed buildings require rapid extrication and treatment. Health care needs include immediate emergency trauma care, follow-up medical and surgical care, forensic disposition of bodies and body parts, and mental health care.

Mass trauma related to explosions can produce unique patterns of injury, which are seldom seen outside of military hospitals. When explosions occur, they have the potential to inflict multi-organ, life-threatening injuries on many victims simultaneously. The impact of an explosive event depends largely on the composition and amount of explosive materials involved, the surrounding environment, delivery method (if a bomb), distance between the victim and the blast, and any intervening protective barriers or environmental hazards. Blast-related injuries can present unique triage, diagnostic, and management challenges to physicians and other health professionals.

After an explosive event, physicians and hospitals must be prepared to treat hundreds or thousands of casualties. Their response, however, may be complicated by the loss of utilities (eg, electricity, water), difficulty in transporting victims, lack of trained personnel, and damage to the hospital infrastructure. Similar effects can be encountered in natural disasters such as tornadoes, earthquakes, and industrial or gas main explosions.

Recognizing that few U.S. health professionals have experience with explosion-related injuries and mass casualty situations, the Centers for Disease Control and Prevention (CDC) prepared the following resources to enhance awareness of the unique pathophysiology of injuries associated with explosions and the care of casualties from explosives and blast injuries:

[CDC Mass Trauma Preparedness Site](#)

- [Explosions and Blast Injuries: A Primer for Clinicians](#)
- [Fact Sheets for Clinicians and the Public](#)
- [Mass Trauma Casualty Predictor](#)
- [Mass Trauma: Essentials for Public Health Professionals and Clinicians](#)
- [Mass Trauma: Essentials for the Public](#)
- [Predicting Casualty Severity and Hospital Capacity](#)
- [Rapid Assessment of Injuries from Mass Trauma Events](#)

Suggested Reading

Bellamy RF, Zajchuk R, eds. *Conventional Warfare: Ballistic, Blast, and Burn Injuries*. Washington, DC: Office of the Surgeon General of the United States Army; 1991.

Briggs SM, ed. *Advanced Disaster Medical Response*. Boston: Harvard Medical International Trauma and Disaster Institute; 2003.

Comprehensive handbook for multidisciplinary disaster teams, includes sections on mass casualty management, essentials of disaster response, public health response to disasters, incident command structure, medical response to terrorism, as well as environmental and other special considerations in disaster management and response.

Stein M, Hirshberg A. Medical consequences of terrorism: the conventional weapon threat. *Surgical Clin North Am.* 1999;79:1537-1552.

Reviews characteristics and medical management of blast injuries caused by terrorist use of conventional munitions and explosives.

Wightman JM, Gladish SL. Explosions and blast injuries. *Ann Emerg Med.* 2001;37:664-678.

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