ASPR TRACIE Technical Assistance Request

Request Receipt Date (by ASPR TRACIE): 3 September 2020
Response Date: 9 September 2020
Type of TA Request: Complex

Request:

The requestor stated that their hospital is working with their region’s healthcare coalition on a trauma mass casualty incident (MCI) virtual tabletop exercise (TTX). They would like to use the industry site explosion that occurred in Beirut, Lebanon on August 4, 2020 as their TTX scenario. The requestor asked if ASPR TRACIE could help identify updated figures on the number of people injured and killed by the Beirut explosion and the mechanism of injuries from the incident to help with victimology for the exercise’s scenario.

Response:

The ASPR TRACIE Team reached out to members of our Subject Matter Expert (SME) Cadre for more information. We also conducted a search online and reviewed existing ASPR TRACIE resources for relevant materials (namely the Active Shooter and Explosives, Chemical Hazards, Exercise Program, and Pre-Hospital Mass Casualty Triage and Trauma Care Topic Collections). Materials gathered can be found in the following sections.

NOTE: Due to the recent nature of this MCI, the ASPR TRACIE Team was unable to find many resources that specifically identified the types of injuries incurred as a result of the explosion. However, we provided other relevant resources in Section III of this document which include injuries that would be expected or are common following such an explosion.

I. Beirut Explosion Statistics

The ASPR TRACIE Team gathered the most current statistics available related to the Beirut explosion; information and the sources from which it was gathered are as follows:

- As of August 18, 2020, the death toll stands at 178 people.
  - The number of fatalities could reach up to 200.
- There are approximately 30 people missing.
- 6,568 people were injured.
- Three of Beirut's major hospitals had to close, and three others were partially damaged following the explosion.
  - Approximately 500 hospital beds were lost.
- Around 300,000 citizens were left homeless.
Resources:

II. Resources on Types of Injuries and Health Impacts from the Beirut Explosion


The author of this article interviewed three scientists to discuss the health and environmental impacts of the explosion in Beirut. The interviewees noted that they were concerned about the dust and toxins that have been deposited over the city, which could lead to asthma, allergies, pulmonary disease, and other acute and chronic health issues. They were also concerned about the increase in COVID-19 cases and deaths due to residents’ inability to access medical care.

Jerusalem Post Staff. (2020). Most Common Injuries Suffered at Explosions Such as One in Beirut.

This article addresses five types of injuries that can occur during explosions similar to the explosion in Beirut. The authors indicate that the first injury is damage to the body by shrapnel and flying or falling objects. The second type of injury is infections that occur when wounds and injuries are left untreated. The third cause of injury is caused by a blast’s shock wave, which can send individuals airborne, then into buildings, walls, cars, or other objects. The fourth cause of injury is damage to the organs, intestines, sinuses, and blood vessels caused by air pressure or effects of the shock wave. Finally, the fifth cause of injury is damage to the auditory system (e.g., ruptured ear drums), from the sound and shock waves of the blast.

III. Other Relevant Resources (Not Directly Related to the Beirut Incident)


This webpage contains resources to assist clinicians with treating victims of bombings and other explosive events. Included are fact sheets; training materials; and a link to a mobile application to assist in the response and clinical management of blast injuries.


The resources in this Topic Collection can help exercise designers, planners, researchers, and other interested individuals plan exercises with robust evaluation and in compliance
with Federal guidelines. **NOTE:** The Discussion-Based Exercise Templates: Mass Casualty Incident section may be particularly helpful for this request.


This supplemental issue of the Annals of Emergency Management highlights best practices in managing explosive incident scenes. This issue begins with an article featuring consensus statements and includes other pieces on blast physics, medical management of the scene, management in healthcare facilities, and the future of explosive scene management.


The authors share lessons learned from a January 2003 chemical plant fire and describe the challenges associated with managing patients with combined burn and trauma injuries. Recommendations for future disaster responses are included.


This document provides information for clinicians on the unique pathophysiology of injuries associated with explosions. It provides tables to include the mechanism of blast injuries and the types of explosive-related injuries.


British researchers developed an expert consensus regarding the essential items and minimum quantities of clinical equipment necessary to care for 100 patients on the scene of a mass casualty explosion event.


This template was developed to help hospitals in New York prepare for and respond to explosive and mass casualty events. The templates can help facilitate coordination between various hospital departments and can be customized by healthcare facility emergency planners across the country.
In 2004, 10 bombs exploded in four commuter trains in Madrid, Spain. The authors provide an in-depth overview of the 250 patients with severe injuries and found the following injuries in patients: soft tissue and musculoskeletal injuries (85%), ear blast injury (67%), blast lung injury (63%), and head trauma (52%).

The authors review the presentation, pathophysiology, and treatment of pediatric victims of blast injury, chemical weapons, and biological weapons, with a focus on those injuries not commonly encountered in critical care practice.

The authors discuss several lessons that emergency physicians and other healthcare professionals have learned in Lebanon over the years having dealt with multiple MCIs.

This article describes the physics behind the chemical explosion in Beirut, Lebanon along with other past examples, which help explain the patterns of trauma that occur after such explosions. She also goes into detail about the chemistry of ammonium nitrate, which was the chemical that caused the explosion in Beirut.

Based on a literature review, the authors discuss some key points for the immediate care of blast injury victims. Specifically, they note that these patients should be treated as having multisystem trauma and managed according to Advanced Trauma Life Support guidelines, and damage control resuscitation should be practiced until definitive hemorrhage control has been achieved.

This presentation takes participants through a blast injury scenario at a busy train station. The authors explain the differences between "traditional" attacks and the "new threat environment" (e.g., improvised explosives, lone wolf shooters) and strategies for related casualty care.

This article describes in detail the simulation plan for a blast-related mass casualty incident exercise targeted to emergency medicine residents. All of the associated materials may be downloaded for free. All the supporting materials are available for free download.