Just-In-Time Learning Series:

INTRODUCTION TO EXPLOSIVES AND INCENDIARIES

Region 8 MOUNTAIN PLAINS Regional Disaster Health Response System

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Explosive and incendiary devices can be an **intentional or accidental cause of morbidity and mortality**. In these scenarios, **patients may self-present**, and events will unfold before all information is known about the situation.

Consideration of decontamination is critical, as all bomb/incendiary events may have the potential for chemical and/or radiologic contamination.

INCENDIARIES

Flammable, designed to start fires.

Common Incendiaries

- Magnesium (powder or solid)
  - Reacts with water to produce hydrogen
  - Causes inhalation burns
  - Remove particulate from patients before irrigation
- White Phosphorous (solid)
  - Ignites when exposed to air
  - Immerse/rinse with water or saline
- Thermite (metal powder and metal oxide
  - Challenging to ignite, mg often used
  - Scatters molten iron
  - Cool patients and remove contaminated debris

Provide standard burn care to patients and focus on stopping the burn process. If the airway is involved consider intubation early. **Trauma trumps burn.**

EXPLOSIVES

Liquid, powder or solid explosive material designed to lead to a sudden release of energy

- Can be mechanical, chemical, or nuclear
- High Order (Blast Wave):
  - Dynamite - easy to get, degrades
  - Ammonium Nitrate - readily available in fertilizer
  - ANFO: Fertilizer and fuel oil
  - C4, TNT
  - **A blast wave is unique to high order explosives**
- Low Order: Sub sonic, gun powder, petroleum based, pipe bombs.
- Improvised Devices are transportable, can be detonated remotely, and can be easily hidden. Where there is one bomb, there are often others targeting responders.

INJURY CATEOGRIZATION FROM EXPLOSIVES

CATEGORY	CHARACTERISTICS	BODY PART AFFECTED	TYPES OF INJURIES
Primary Injury	• Unique to high order explosions • Impact of over-pressurization wave	Gas filled structures: lungs, GI, middle ear	• **Blast lung (pulmonary barotrauma)** ◦ Common cause of primary and delayed mortality ◦ Clinical signs include dyspnea, hemoptysis, butterfly pattern on Cxr. Treatment includes oxygen, supportive care, and observation • Tympanic membrane rupture, middle ear damage • Abd hemorrhage and perforation • Globe rupture • Concussion
Secondary Injury	• Flying debris and fragments	Any body part	• Penetrating ballistic fragments • Blunt injury • Eye penetration
Tertiary Injury	• Individuals thrown by a blast wind	Any body part	• Fracture, amputation • CHI
Quaternary Injury	• Explosion related illness, injuries, disease not due to primary, secondary or tertiary	Any body part	• Burns, chemical radiation • Crush • TBI • Pulmonary sequelae

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