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Blast Injury Treatments

Multi-Major Responses: Projectile Signs, Primary Wounds, Trauma & More

▶▶ If you're in the Tactical Medicine business, you need to be prepared to respond to a bombing. Today's Tactical Medic must become familiar with the deployment techniques, blast mechanism and injury patterns of these devices.

The military perspective and LE perspective will differ somewhat as far as deployment and blast mechanism, but similarities exist. Radical Muslim Extremists have favored the roadside bomb in attacking our troops and convoys. Originally a simple explosion, the roadside bomb has evolved to a shape charge that can launch a large armor-penetrating projectile into its intended target. This is usually followed by a secondary ambush with automatic weapons to finish off the soldiers. Remember this, because you're going to have to deal with severe trauma from the blast projectiles and gunshot wounds on top of primary blast injury. Better detection techniques, vehicle armor and tactics have proven a worthwhile counter to terrorist techniques, but both sides continue to upgrade their technology.

Tragic Triage

In the civilian world, convoys are less common and terrorists favor soft targets. These are areas where innocent people congregate in large numbers. Nightclubs, schools, shopping malls, office buildings, and high rise towers, are the targets of choice. Bezan proved that children as targets have the most emotional impact on any society and thus they will remain prime targets. When you respond to such a scene there will be a zone around the bomb or bomber without survivors. You can't help them so don't disturb the crime scene. There will be others that will die despite the most aggressive treatment. Look for the ones with less severe injuries, as those are probably the only ones you can do something for. You will have to step over and pass people screaming and dying to get to the ones that you can help.

Can you handle this from an emotional standpoint? Do you have enough medical manpower to handle all these casualties? Do you have all the necessary equipment in pediatric sizes to handle this problem?

Healthcare providers are difficult to replace, so you're the next target on the hit list. The Israeli experience has shown us that terrorists expect an EMS response within a certain time frame. Secondary devices are placed to kill the EMS responders and LE investigators responding to the primary explosion. We should appropriately expect secondary devices in a stateside suicide bombing and not learn the hard way. Don't waste time within the blast area and don't park your vehicle in areas that are convenient staging areas. Bombers have anticipated this and that's where they'll place a secondary device.

☞ Tertiary blast injuries are from the body being hurled outwards from the blast, ending in an impact on some object. ☞



The only way to effectively deal with real-world "blasting-zone" scenarios is to train for such incidents in a controlled environment as is depicted here.

What Kills

Blast mechanism remains the same for any explosive device. Primary blast injury is caused by the shock wave from the explosion where tissues are disrupted at air/fluid interfaces in a process called spalling. Any air-filled structure in the body is at risk. Ears and lungs are most commonly injured, but bowel injuries more common with under water blasts. The degree of injury is related to the magnitude and duration of the peak overpressure of the blast shock wave. Death nearest to blast is usually caused by massive cerebral or coronary air embolism. Primary injury to the lung is referred to as blast lung. Blast lung is the major cause of death in primary blast injury. The mechanism simply is that the alveolar membranes of the lung are torn with minimal to massive hemorrhage. This leads to hemothorax (blood in the chest cavity) or air emboli (air in the blood stream), which kill the victim.

Secondary Blast Injury

Secondary blast injury is caused by debris set into motion by the explosive device when they impact the victim's body. Suicide bombers will typically place

ball bearings, nails or other projectiles on their belt-shaped bomb that will maximize the damage to the target. The bomber may also be infected with hepatitis or HIV, which will be carried to the surviving victims via bone and tissue fragments set forth in the blast. Clearly some damage may be immediate, while other damage may take years to manifest and kill the victims. These projectiles will need to be treated as any other traumatic injury and biohazard.

Tertiary Injuries

Tertiary blast injuries are from the body being hurled outwards from the blast, ending in an impact on some object. The resultant blunt trauma is similar to injury patterns from falls from significant height. Broken bones and head injury are common. People may be disoriented when you reach them and may not follow commands. This will make it difficult to render care when combined with the emotional trauma these people have experienced.

As long as terrorism strives for bigger and bolder attacks, Tactical Medicine providers must anticipate these actions. Train for blast injuries with your team. It's not a matter of if it will happen, only when. Should they be the targets of a bombing, your team members must be able to apply tourniquets as self-aid and get back into the fight. Bleeding from the extremities will need to be rapidly controlled with tourniquets, direct pressure and dressings. Make sure you have enough tourniquets and dressings to handle the job.

Let's recap:

- Survivors will need appropriate triage and transport to trauma centers.
- Rapid identification of the survivors is expected of the trained tactical medic with as little disturbance of the crime scene as possible.
- Make sure you have enough gear to handle the situation in both adult and pediatric sizes.
- Swift evacuation of any identified survivors must be carried out prior to detonation of a secondary explosive device.
- Expect a secondary device or even a third, at any suicide bombing you encounter.
- If your team falls victim to a secondary device, everyone should be able to administer self-aid and apply their own tourniquets. **TW**