

# What London Means to You

By S. CHRISTOPHER SUPRUN

The morning of July 7 will be remembered in Great Britain as the morning of September 11 is in New York City and Arlington County, Virginia: a morning like any other, until it wasn't.

That morning, three bombs exploded simultaneously in London's Underground commuter rail system. An hour later, a fourth bomb detonated aboard a double-decker bus. Even after a weekend of rescue and recovery, the number of dead had not been ascertained as this article was going to press, though it was expected to approach 100. Of the 700 who were injured, only 22 required overnight hospital care.

"The London Ambulance Service (LAS) has treated approximately 45 people for critical and serious injuries, and a further 350 for minor injuries," said Allison Curry, a spokeswoman for the LAS. "Many other patients will have made their own way to hospital for treatment." The LAS, which had more than 100 ambulances and nearly 300 staff involved with the efforts, also had a normal day's responses to run as well, including vehicle accidents and medical emergencies.

Though not on the scale of the 9/11 attacks, authorities say the coordinated efforts of a multi-site attack with explosives had all the earmarks of an attack by Al Qaeda, similar to the coordinated attack on the Madrid rail system in 2004, the four-plane attack staged in the United States in 2001, and the twin African embassies in 1998.

Like some in America who thought the first plane crash into the World Trade Center was just an awful accident, Lee Parker, a veteran LAS paramedic who has worked on the ground and in the air as part of London's EMS system, thought that this might be a rail crash.

"My initial reaction was that this was going to be a truly

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hard day working in the filth of the Underground, with the rats, and all," said Parker.

In both America and Great Britain, EMS responders are relatively untrained in responding to acts of terrorism, as there have been few such events. Even with years of terror from the Irish Republic Army, Parker had never responded to a bombing incident before this one. IRA attacks were generally for disruption purposes and weren't targeted toward civilians, one LAS paramedic noted in a Weblog. "We barely have any CBRNE (Chemical – Biological – Radiological – Nuclear – Explosive) training at all."

For London, though, it was not the exotics of bioterrorism, a dirty bomb, or a nerve agents but conventional explosives in mass transit.

Explosives injure people in four ways. Primary injuries are caused by the blast front or shock wave of the blast itself. These blunt trauma injuries involve the tissue of the gastrointestinal tract, ear canals, and lung; all can be torn by the shock wave associated with these explosions.

Secondary injuries are caused by fragmentation or shrapnel, creating penetrating trauma. These injuries are caused by fragmentation—which is when the explosive device itself comes apart—or shrapnel, sharp components added to the explosive to further injure victims. In improvised explosive devices, materials such as nails, BB pellets, and screws have been used. "There are weak targets, like the public transport systems," said one paramedic, involved with the three nail-bomb blasts in London several years ago and who asked not to be identified for security reasons, "but being prepared to deal with the worst-case scenario when they are targeted is essential."

Tertiary injuries occur when the patient is pushed to the ground by the blast wave. These injuries consist of neck and back injuries or other traumatic injuries incurred when hurled down or into something. These patients need protection from cervical spine injuries, and must be packaged in C-collars and backboards. This is important to consider because many EMS systems, even fire-based

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EMS systems, can muster only an average of three victims per transporting ambulance. In even a smaller-scale incident, it may be important to have additional MCI resources available and on the way, even if the total casualty number initially appears moderate.

Finally, quaternary injuries are other medical and trauma complaints associated with the explosions. They can include asthma attacks from airborne particulates from the blast wave, a closed head injury, or other blunt trauma from structures collapsing onto the patients.

An important note in dealing with blast injuries is that they are worse in enclosed spaces than in open areas. When a bomb explodes, it overpressurizes the area for a microsecond before the shock wave travels outward in an attempt to equalize from super high pressures to low pressure. These pressure changes create the shock wave.

It's important to remember that the blast wave pressure diminishes as a proportion to the cubed root from the blast distance. A person standing three feet from the blast will receive nine times the pressure of someone six feet away. This rapid dissolution of energy is significant and should remind responders that distance is the best safety mechanism in an explosive event.

The same "Five S" system that works for scene management of chemical terrorism events to start a scene off right can be applied to any incident with multiple casualties:

### Safety

### Scene Size Up

### Send Information

### Set up the Incident Command System and Medical Sectors

### START Triage

Remember that secondary devices are particularly common in explosives incidents. Whether the secondary device is targeted at responders or simply as a way to provide more casualties, as it apparently was in London, be aware that additional explosions may occur.

Parker, the LAS flight paramedic, says it would have been very easy for someone to have left a briefcase bomb—a secondary device—in the hotel where he and a physician were treating and triaging



85 victims. While it crossed his mind, he pushed on with his efforts to treat patients, but recognizing the nature of the incident as a responder is important and should be a consideration in events like this.

Remember that the bad guys plan, just as responders do. Staying safe may be as simple as not parking the same way every time or responding on a slightly different route than normal. Certainly, it will mean asking yourself if anything is out of place and making sure you are being as safe as possible given the situation.

Scene size-up is a task at which the fire service is reasonably good. Whether it is a full-blown house fire, "smells and bells" at our favorite commercial establishment, or an accident scene, more often than not, firefighters can quickly size up a scene, determining what is happening as they arrive both on scene and in the area.

The third S is just as important: send information. Incoming units should be warned as soon as we suspect an explosives event or anything else out of the ordinary.

When you get to a scene, start the incident command system. ICS is not just a tool for house fires; it is for any incident, and should be used in all of them. How an incident starts is often a deciding factor in whether it goes well or poorly. Set up ICS, and start the incident off right.

Finally, START triage. Whether you use the California-based START (Simple Triage and Rapid Transportation) method or some other system is less important than quickly determining the medical severity of the incident. Your officer, the media, and the public will want to know how many victims there are and how

badly they are injured. Using a triage system, first-in companies can quickly provide a basic assessment of how many resources will be needed to respond to these emergencies.

At the Metropole Hotel across from the Edgware Underground station, several of the patients Parker treated became higher priority. "We had several patients with burns and airway issues and were concerned about both inhalation burns and blast lung, so we upgraded their priority," said Parker.

Don't forget that responders need to care for each other after the incident. Critical Incident Stress Management (CISM) services can include defusings, debriefings, one-on-one counseling, and referral to other professional resources. Often, it can be enough for providers to let out pent-up frustrations and feelings by talking about the event and seeing that other providers have similar feelings. Whether you use a formal or informal approach, be sure that long-term stress effects from the incident do not cloud the firefighter's ability to function as part of the department.

The London attack comes a week after a United States Senate committee cut \$50 million in security funds from rail security. Whether Washington alters its course on funding for first-responder training and security grants cannot be predicted, but what we do know is that it is a question of when, not if, terrorists will strike again. As one responder said, "Past experience has taught us in the United Kingdom to be vigilant and remember that although security services do a great job and the best they can, national security is everyone's business." ●