



BOMBS UNDER LONDON

The EMS response
plan that worked



AP/WIDE WORLD PHOTOS/JANE MINGAY

By Stephen Hines, Alan Payne, Jon Edmondson & A.J. Heightman

On Thursday, July 7, 2005, emergency service crews had started another busy day. The London Ambulance Service NHS Trust is the biggest free ambulance service in the world and regularly handles in excess of 3,000 emergency calls a day.

At approximately 0850 HRS, three bombs were nearly simultaneously detonated on the capital's Underground network. A short time later, a fourth device exploded on a double-decker bus. Together, these four explosions killed more than 50, and injured more than 700 people. The capital's public transport system was halted, and a high-level emergency procedure swung into action.

The incident

The first explosion occurred on a Circle Line train between Aldgate and Liverpool Street stations. Police said the following day that the device was placed on the floor of the third carriage and confirmed that seven people died in the blast, more than 100 were wounded and at least 10 were seriously injured.

The second device was in the first carriage by the first set of double doors on a Piccadilly Line train traveling between King's Cross and Russell Square stations. As of press time, 21 people have been confirmed dead due to this blast.

The third explosion was on a westbound Circle Line Underground train, just leaving Edgware Road Station for Paddington Station. Police have confirmed that at least seven people died in the attack.

The final explosion was a blast on a double-decker bus at the junction of Tavistock Square and Upper Woburn Place. The bus roof was blown off, and nearby cars were also damaged. On Friday (July 8), police confirmed that at least 13 people died in this blast.

LAS response

The London Ambulance Service (LAS) received its first emergency call about the incident at 0851 from the British Transport Police requesting its attendance at Liverpool Street Station in response to reports of an explosion. It quickly became apparent that the location of the incident was Aldgate Station, and emergency vehicles were re-deployed to this scene.

Resources were soon sent to several other stations that had been



PHOTO COURTESY LONDON AMBULANCE SERVICE NHS TRUST

All officers wear colored vests to indicate their role on scene. Bronze officers work at an operational level.

fied as areas where large numbers of vehicles would have easy access and where some basic facilities could be accessed. Local managers were assigned to each staging post to ensure staff were looked after and that they were available when needed. Some mutual aid vehicles were used to backfill areas depleted by resources attending the scene.

Altogether, 45 patients were treated for serious and critical injuries (e.g., burns, amputations, chest and blast injuries, fractured limbs), and approximately 300 patients for minor injuries (e.g., lacerations, smoke inhalation, shock, cuts and bruises). An additional 300 people made their own way to hospitals across the capital.

Major incident equipment vehicles were deployed across the sites, taking such additional equipment to the scenes as oxygen, stretchers, dressings and blankets. Tents were also deployed to some sites, but fair weather conditions limited their use.

Each of the scenes was managed by the police, assisted by the other emergency services. Proper Scene Access Control was rapidly put in place, with all persons entering or leaving the scene being logged. This process helped identify all the uninjured people who had been involved and those who had volunteered. It also provided safety and security for ambulance staff as they worked.

Safety was paramount for all staff at these incidents. Ordinary LAS safety precautions include:

- Step 1:** One casualty: Approach with caution.
- Step 2:** Two casualties: Approach with caution, consider all options, give a report to CAC.
- Step 3:** Three or more casualties: Do not approach the scene, withdraw, contain, report, isolate themselves. Ask for specialist help.

Scene Access Control ensured that only those appropriately dressed worked on scene and that staff welfare was monitored.

Police facilitated ambulance access

About London Ambulance Service

The London Ambulance Service NHS Trust provides emergency medical services to a 670-square mile area from 73 ambulance stations equipped with 800 vehicles, including 400 emergency ambulances. LAS responds to an average of 3,500 calls daily (more than a million calls annually), with 650 classified as life-threatening, category A calls. Of 4,000 total staff, 900 are paramedics, 1,500 are EMTs and 150 are officers. The control center has a staff of 300, with five emergency planning managers.

affected by bombs and adjoining Underground stations where passengers were also exiting. Initially, vehicles were sent to Aldgate Underground Station, Liverpool Street Station, King's Cross Underground Station, Russell Square Underground Station, Edgware Road Underground Station, Tavistock Place and Moorgate Underground Station.

LAS was facing a major incident, and its plans, which had been honed and meticulously practiced since the 9/11 attacks in America, were quickly put into action.

Central Ambulance Control (CAC) immediately opened Gold Control (the LAS command center) under the leadership of Deputy Chief Ambulance Officer Martin Flaherty (see p. 62).

Paul Woodrow, who acted as a Silver Incident Officer at Russell Square, said, "The emergency services responded as they had in practice many times before. We wanted to ascertain what was happening and set up the

command structure. We set up a triage area in the concourse of the tube station so we could establish who needed what level of care."

Involved staff totaled more than 250, staffing approximately 100 ambulances. They were supplemented by large numbers of volunteers. Five of the six LAS command and control vehicles were deployed to the incidents. The remaining one was held in reserve as a management cell in case any further incident occurred.

The incident at Tavistock Square occurred outside the headquarters of the British Medical Association, and 14 doctors offered their assistance, treating casualties on scene.

Mutual aid was called upon from neighboring ambulance services, such as Bedfordshire, Hertfordshire, Kent, Surrey and Essex, and voluntary agencies, such as St. John Ambulance and British Red Cross. The mutual aid vehicles staged at previously agreed upon locations—sites identi-

to and from all sites and hospitals. There were no reports of ambulances being blocked in by police or fire vehicles at any of the scenes. LAS allocated a role of Parking Officer at each of the sites at the initial stage of the incident. This task was very important to ensure that when casualties were being extracted, they could then be loaded quickly into an accessible vehicle that could easily exit the site.

By protocol, LAS uses small vans and buses to transport minor/walking wounded patients. Police escorts are used when necessary in case of a patient deteriorating en route to the hospital. Medical staff are placed on the transport and carry the appropriate medical equipment to treat patients who may deteriorate. They also carry a portable radio. These patients are conveyed to one of the receiving hospitals that are on declaration of a major incident (see p. 65). Prior to the bus/coach leaving the scene, the hospital is advised and patient capacity

confirmed. It's expected that all London receiving hospitals should be able to receive such numbers of walking patients during an incident, although this must be confirmed.

Good communication was key to the smooth running of the incident. Duty Station Officer vehicles carried stocks of handheld portable radios and packs for the correct recording of decisions and vehicle movements, allowing for flexible, local control of each incident site. Messages that were passed to and from the scene and ambulance control were in a predetermined format, ensuring that all relevant information was contained. A Primary Telecoms Officer in Gold Control communicated with hospitals in a similar fashion. All of these communication procedures allowed the Gold Control team to maintain a pan-London picture.

The LAS CAC staff worked diligently to support crews. They received some difficult and traumatic calls from

members of the public and dealt with them calmly and efficiently during a highly emotional period. The efforts of LAS staff who continued to deliver routine services must also not be underestimated. They did a sterling job of ensuring that normal service continued throughout.

Additionally, LAS received tremendous help and assistance throughout the day from businesses and members of the public. Hotels and supermarkets were used as casualty treatment stations, enabling the walking wounded to be rapidly cleared from the scene and allowing LAS staff to pay maximum attention to the more seriously injured. Bystanders offered help to crews and helped assist their fellow passengers off trains quickly.

Members of the public responded well to requests that they should not call 999 [the U.K. equivalent to 9-1-1] unless they required treatment for life-threatening illnesses or injuries. The public compliance helped alleviate

Command Structure

In London, a major incident may be declared by any operational staff members from one or more of the emergency services who consider that any of the criteria outlined within their own major incident plans has been satisfied. The EPO and MIO wear tabards with a silver top and green/white chequered lower half, and silver officers wear tabards that are silver in color. Bronze officers wear tabards with a yellow top and green/white chequered lower half. At this incident, the incident command structure was:

GOLD COMMAND

- Assistant Chief Ambulance Officer: Martin Flaherty
- Medical: Dr. Ken Hines, Dr. Simon Brown

SILVER OFFICERS

Aldgate—David Campbell

- Medical Incident Officer: Dr. Gareth Davies
- Drs. David Lockey, Fenella Wrigley, Beverly Watts and Peter Johnson

Edgware Road—Peter Swan

- Medical Incident Officer: Dr. David Wise
- Dr. Sabeena Qureshi

Tavistock Square—Paul Gibson

- Medical Incident Officers: Drs. Tim Harris, Ian McGovern and Julian Redhead
- Drs. Ben Teasdale, Peter Holden, Kirsten Seipolt, Dan Ellis, John Black and Mary Heggarty

Russell Square—Paul Woodrow

King's Cross—Stephen Sale



Central Ambulance Control

- Medical Incident Officer: Dr. Rod Mackenzie
- Drs. Ann Weaver, David Gaunt, Steve Bland, Tony Kehoe and Alistair Mulcahy

At staging posts elsewhere in London:

- Ambulance Officers Charlie Clapson, Alan Payne, Stephen Hines, Symon Morley (with the command vehicle)
- Drs. Jonathan Glover, Fiona Jewkes and Susan Rothwell
- 48 British Red Cross vehicles
- Additional resources were also deployed to mainline rail stations throughout the country to give any assistance needed to returning commuters.
- A joint London Ambulance Service and British Red Cross presence has been maintained to provide cover for staff working at all sites, and also at the reception centers set up for families.



COURTESY LAS NHS TRUST

The first crew on scene at a major incident is responsible for assessing the scene and requesting the dispatch of additional resources, such as this control vehicle.

some pressure on Central Ambulance Control, and the number of calls overall were down for an average day.

Why the plan worked

The LAS major incident plan is constantly revised, tested and updated. It is dovetailed into the London Emergency Services Liaison Panel plans (available online at www.leslp.gov.uk).

The plan centers on such issues as command, safety, communications, assessment, triage, treatment and transport. All ambulance responders who could be activated to the scene of a major incident are issued a set of cards

describing immediate actions and key roles at the scene.

The command structure works on three levels—Gold, Silver and Bronze. Gold-level officers act at a strategic level, silver officers at a tactical level and bronze officers work at an operational level. All are expected to wear colored tabards (i.e., vests) so that they are immediately identifiable.

Assessment and triage are started by the first crews on scene. The attendant on the first ambulance will assume the role of Silver Medic. They will make a quick assessment of the scene and report using the mnemonic METHANE:

- M** Major incident declared (or hospitals advised to stand by).
- E** Exact location of the incident, including map references, if possible.
- T** The type of incident, with brief details of types and numbers of vehicles, trains, buildings, aircraft, etc.
- H** Hazards present and potential.
- A** Access routes and suitable

provisional rendezvous points.

N Approximate numbers of priority 1, 2 and 3 patients, and the dead and uninjured.

E Emergency services present and required, including local authorities. Consider medical team(s). Special equipment and services (e.g., Helicopter Emergency Medical Service [HEMS], emergency planner, doctors, control vehicles, support vehicles). Request number of LAS resources required.

LAS also has an Emergency Planning Unit (EPU) dedicated to preparing crew staff and officers for responding to major incidents. EPU ensures that the plans are regularly tested and LAS staff attend approximately five practical live exercises a year. The most recent was a simulated train accident at Tower Hill Underground Station in June.

Over the years, LAS staff have managed many difficult incidents, and many staff who responded to the

London bombs had been to the IRA Docklands bombing and the rail crashes at Southall and Ladbroke Grove. (For a list of other major incidents LAS has handled, visit www.jems.com.)

The LAS uses the TSG Associates triage system (known in the United States as the SMART triage system). This system is a physiological one that relies on changes in vital signs as a result of an injury or illness. During an incident, the LAS uses two levels of triage—sieve (i.e., primary triage; carried out by the second-arriving crew) and sort (i.e., secondary triage; patients are assigned a revised trauma score; carried out in the casualty clearing station). Both allow casualties to be sorted into one of five priority groups, identified by a colored label:

- 1** Immediate (Red)
- 2** Urgent (Yellow)
- 3** Delayed (Green)
- 4** Expectant (Blue)
- Dead** Deceased (White or black)

Each LAS vehicle carries a pack consisting of 20 triage cards. The

LAS quickly put its major incident response plan, honed & meticulously practiced following the 9/11 attacks in the United States, into action.

major incident vehicles carry additional supplies.

The hospital response

During major incidents, LAS uses only hospitals that have been given a “declaration message.” (At the onset, selected hospitals are notified that a major incident has occurred and that they should activate their own major incident plans.) For incidents that have been declared but have a minimum amount of casualties, LAS personnel seek guidance from Gold Control to use a hospital on “stand-by.” Casualties are distributed (by highest priorities first) among “declared” hospitals in no facility priority order; they are evenly distributed among the declared hospitals. Crews always confirm the receiving hospital with CAC before leaving scene.

At press time, Claire Burroughs,

Head of Communications at St Mary’s Hospital, Paddington, said 10 victims were still in the hospital, two critical with multiple injuries and eight critical but stable. Burroughs added, “Casualty staff said they saw in a day what they would normally experience in a year at Accident and Emergency.”

The Chelsea and Westminster Hospital confirmed it was treating four people in the hospital’s burns unit.

The Royal London Hospital, near Liverpool Street Station, said it was continuing to treat 26 patients, seven in intensive care. They had treated 208 in total.

The Royal Free Hospital in Hampstead, north London, said it was still treating 13 people and all were in stable condition. One person was serious but stable. Two additional patients, with ear injuries caused by the bus explosion, were being treated at the

Royal National Throat, Nose and Ear Hospital near King's Cross. They had treated 61 patients.

Great Ormond Street Hospital was still treating four adults injured in the bombings, two of whom were described as in a serious condition. Great Ormond Street Hospital is a children's hospital with no Accident and Emergency Department. Due to its proximity to the incident it treated 22 casualties, none of whom were children.

A spokesman for University College Hospital said, "Twenty-three patients are still admitted, including five in intensive care. Twelve of the patients seen were foreign nationals."

Guy's and St. Thomas's NHS Foundation Trust said it had a total of 13 patients remaining. One patient is in a critical but stable condition. The other patients are all in a stable condition, and six had undergone surgery. Nine others were seen and have been discharged.

Russell Smith, Assistant Chief Ambulance Officer, paid tribute to the network of doctors who assist LAS, saying, "They support us at times like this."

His sentiments were echoed by London Chairman of the British Association for Immediate Care (BASICS) Dr. David Ziderman, who said, "A total of 24 doctors from BASICS and London's Helicopter Emergency Service were deployed by air and land. The first reached the scene within about three minutes of activation. Within 30 minutes each scene had an operational Medical Incident Officer. Each doctor worked alongside a paramedic."

Conclusion

A tried and tested plan, well-trained crews and staff and the availability of equipment on vehicles around London meant that London Ambulance Service was able to respond efficiently to these horrific events *and* maintain appropriate service levels to the rest of the city.

All staff involved in this incident have already been offered occupational health and counseling services. JEMS

For more information on the LAS MCI response plan, visit www.jems.com.

Stephen Hines is a paramedic training officer for the London Ambulance Service NHS Trust. He is involved in teaching members of the public and health-care professionals and is also a faculty member of the University of Hertfordshire paramedic degree course. He holds an honours degree in paramedic science and is one of the few paramedics who holds the Diploma in Immediate Care from the Royal College of Surgeons of Edinburgh. He is a member of the guidelines subcommittee of the Joint Royal Colleges Ambulance Liaison Committee and is actively involved in the development of the UK National Clinical Guidelines. Contact him via e-mail at stephen.r.hines@ntlworld.com.

Alan Payne is a duty station officer for the London Ambulance Service NHS Trust, based at Hillingdon in west London. He chairs the LAS alternate response group, which reviews how best to respond to emergency calls, including non-ambulance responses when either additional skills may be needed or the condition of the patient does not require the attendance of a front-line ambulance. Payne also has operational responsibility for emergency medical care at Heathrow Airport and coordinates the response to any incidents at the airport. He has overseen the trial use in the airport of EMS bicycles, which has significantly reduced response times to emergency incidents. Contact him via e-mail at Alan.Payne@lond-amb.nhs.uk.

Jon Edmondson is an emergency planning officer for London Ambulance Service. He has been responsible for writing large portions of the London Ambulance Service Major Incident Plan and is the driving force behind many interservice exercises, testing and revising each part of the plan on a regular basis. He works regularly with the police and fire services, as well as doctors, hospitals, the Voluntary Aid Societies, transport authorities and utility companies to ensure that London can respond to incidents of any nature.

A.J. Heightman is editor-in-chief of JEMS. He's a former EMS director and EMS operations director who has researched and specialized in MCI management training for 30 years. Contact him via e-mail at a.j.heightman@elsevier.com.