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Military Perspective On The Civilian Response To The London Bombings July 2005

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Introduction

The challenges of military and civilian pre-hospital care have similarities and differences. The pre-hospital response to the terrorist bombings in London on the 7 July 2005 required awareness of threats seen in both systems to manage them effectively. This article uses these incidents to examine the common issues in the two areas of practice and suggests that some military personnel may benefit from a secondment to a civilian pre-hospital care post. The civilian system may also benefit from having military experience in its system. Threats against defence medical personnel in the field include the threat from insurgency and asymmetric actions. These threats are managed with a robust and planned approach to personal safety, a high level of awareness and a dynamic and flexible response. In civilian UK pre-hospital practice patient entrapments, usually as a result of road traffic accidents are relatively common. In cities like London with an extensive underground railway network patients regularly fall under trains resulting in serious injuries. Both of these incident types require a multi-agency approach to a clinically challenging scenario. The London bombings involved four separate simultaneous incidents. In both military and civilian emergency care an effective response to multiple incidents is a major challenge to the command and control infrastructure.

The medical response to these incidents was provided by doctors and paramedics from London Helicopter Emergency Medical Service (HEMS) in conjunction with doctors from the London Medical Incident Officer pool and London BASICS (1). This formal response included 18 doctors working in doctor – paramedic teams, either as Medical Incident Officers (with London Ambulance Service Incident Officers) or in medical teams. London HEMS has long had an association with military clinicians and a number of the team members have military experience, including exposure to blast injuries and an awareness of CBRN (chemical biological, radiological and nuclear) issues.

Initial deployment

Initially emergency calls suggested multiple power surges within the London Underground Network. As fatalities were confirmed a team was sent by road to the nearest incident and other teams were sent by air to the more distant incidents. As the incidents developed it became obvious that explosions had resulted in multiple blast casualties. Initial clinical assessment of casualties, in conjunction with CBRN assessment teams at some sites, did not suggest any chemical or radiological hazard. The fourth explosion on a bus approximately an hour after the first three underground detonations highlighted the risk from secondary devices.

Command, Control and Communications

The Major Incident Medical Management and Support (MIMMS) paradigm of a concentric infrastructure was not readily applicable to these incidents (2). MIMMS divides the emergency response into bronze (scene), silver (tactical) and gold (strategic). Although there were four bombs, there were at least six separate silver health command teams. A summary of the silver scenes is shown in Figure 1. There were a number of reasons for two additional silver commands for health services. Incidents within an underground tunnel have the potential to split resources as casualties and responders have at least two exit and access points respectively. The bomb on the Piccadilly line train was between Kings Cross and Russell Square stations. Survivors emerged from both stations at geographically separate locations. The overground bus explosion in Tavistock Square was divided on security and safety grounds due to the risk of secondary devices and preservation of the scene of crime.

On the battlefield, predetermined medical support areas are planned, with forward medical teams often embedded in forward units. Examples of splintering of the command structure are seen in non-medical units warfare operations. A former US Marine Corps Commandant stated that in urban military operations an operational unit might have to switch from humanitarian assistance to peace enforcement to warfighting within a three-block area (3). Similar flexibility may be required of medical resources at major incidents. In London clinical staff were used in both organisational (command) and clinical roles. As incidents evolved, clinicians in mobile medical teams (clinical role) assigned to one incident (King's Cross) became incident officers

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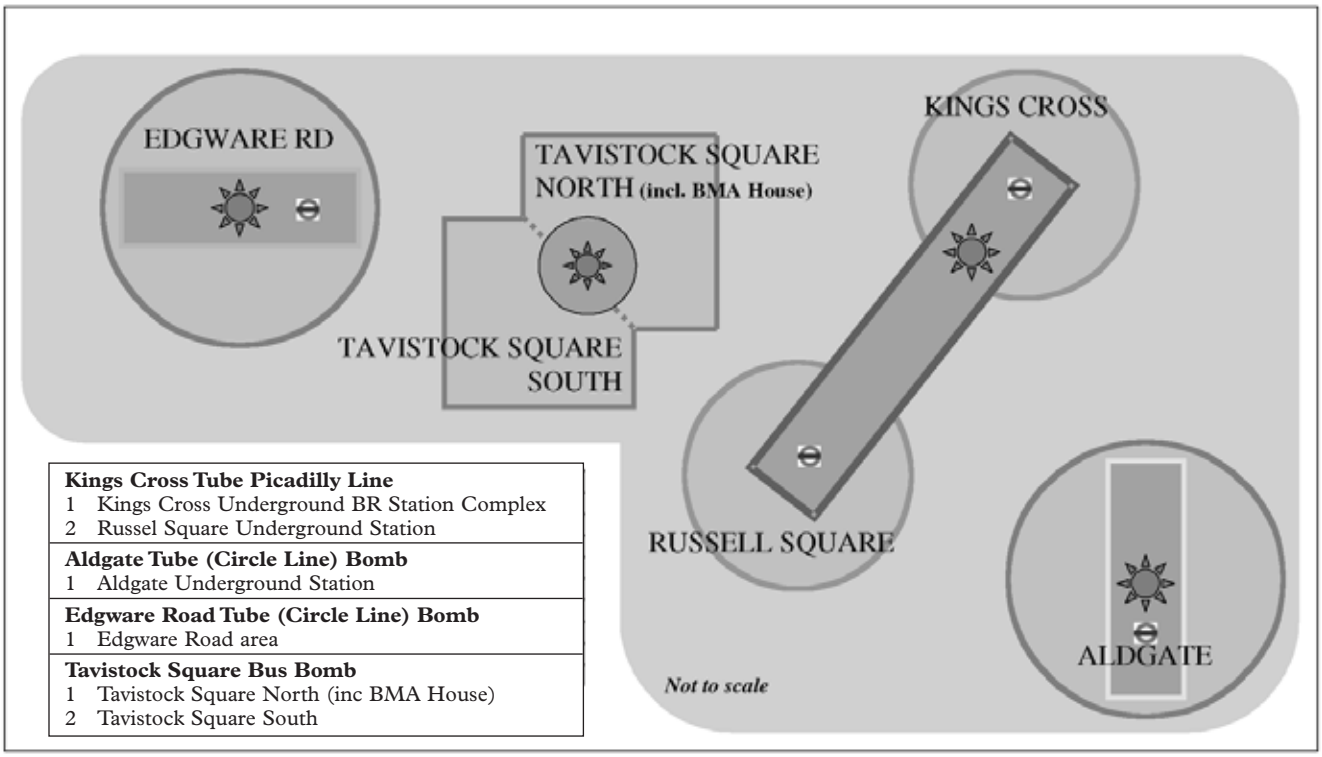

Fig 1 - London Bombing Scenes.

(command role) after encountering a new incident (Tavistock Square). There is obviously a requirement for these doctors to be properly trained in all potential roles. There is also a requirement to track and monitor medical resources due to evolving circumstances and new threats – perhaps defined as the medical battlespace. An example of a catastrophic failure to chart this battlespace was the collapse of the World Trade Centre and loss of New York Fire Department responders as well as their command centre.

Lessons identified from Operation Telic highlighted difficulties with communications, especially for mobile units and the maritime component. This was also true for the medical response on 7th July. Mobile telephone communications were in massive demand by the general public and this overload led to most networks failing. Radio communications were also problematic, especially within deep tunnels. Communication between scenes and from scenes to hospitals and control desks was almost impossible during these incidents. Communication requiring less bandwidth and communication time (text messaging/paging) appeared to have greater resilience when mass communication occurs (a lesson identified from previous major incidents). The role of digital communications may need to be reviewed in future emergency planning.

Scene safety

Scene safety is vital for emergency responders and is facilitated by an effective command and control structure. Casualties trapped in underground tunnels present significant safety concerns. The civilian scenario has well-recognised hazards including confined spaces, electrical hazards and further train movements. In addition to the usual hazards terrorist incidents present additional dangers. In other incidents terrorists have been still present at the scene or have sometimes placed improvised explosive devices (IEDs) as parallel or secondary devices at the scene (occasionally on live and dead bodies). Some may be specifically targeted at the responding emergency services (4). The use of explosive devices in confined spaces generates additional hazards including combustion products, particulate (dust) matter and biological debris with the risk of bloodborne diseases and bone fragment needlestick injuries. Active combustion with high levels of asphyxiants and combustion products could have prevented emergency service access to the immediate scene. This difficult situation was seen at the major fire at Kings Cross underground station in the late 1980s.

In terrorist incidents the possibility of CBRN agent use always has to be considered. In these incidents clinical screening (the use of a chemical primary survey) and, at some incidents, the use of chemical agent monitors by assessment teams rapidly established that the risk was low. The differentiation of hazardous material and CBRN still remains a matter of debate in both military and civilian agencies. The term CBRN is generally used for agents that are released deliberately, while the term hazardous material is used to describe accidental releases. Both types of incidents may involve trauma causing combined injuries. The evolution and timeframe of events in London have similarities with the Tokyo subway attacks in 1995. There was an initial confusion in both events as to the cause of the incidents (power

Table 1. Potential Scene Hazards.

TYPE OF HAZARD	PRESENT	POTENTIAL
Environmental	Confined space Heat Electrical (traction) current Sharps/debris	Active combustion/fire Tunnel collapse
Chemical	Combustion products Particulate (dust) debris	Specific chemical agents
Biological	Biological debris, including needlestick risks (bone fragments)	
Radiological		Low dose debris/dust High dose fragments/ debris/dust
Other	Secondary devices (? bus bomb)	Armed perpetrators

surge/ bombing/derailment/crash/chemical attack fire). However, recent uses of CBRN agents (sarin, anthrax, salmonella) have been covert without the use of an explosive dispersal device (5-7). An explosive device would more likely be a radiological dispersal device (RDD) or 'dirty bomb'. Universal precautions, with the use of respiratory protection (dust masks), would provide adequate protection from low-level radioactive material and the conventional particulate matter that was present at all three of the London underground scenes. High levels of radiation from a RDD would be more problematic but these devices would be more difficult to procure, manufacture and more easily detectable before and after the device had been activated. A high level of radiation would require more limiting protective measures, including restriction of time in the 'hot zone', shielding and decontamination. This would inevitably result in prolonged scene times. The risk/benefit assessment of the degree of personal (individual) protective equipment required is one that military personnel are used to. Increased PPE carries with it risks of heat illness, loss of manual dexterity, capability and sustainability.

Receipt of information from the scene as the incident develops allows a dynamic risk assessment and the appropriate deployment of rescuers within the incident cordons. A summary of the potential scene hazards are summarised in Table 1.

Clinical

Major incident plans are mandatory in civilian and military practice. They have been exercised and, on occasion, activated. In the UK, most scenarios are planned around single sites, such as mass gathering and accidental transportation incidents. Towards the end of the IRA mainland bombing campaign, targets such as Canary Wharf, Manchester and Bishopsgate, were high profile, large scale and unifocal with a low casualty rate; there were notable exceptions. Extremists have targeted London before using IEDs aimed at specific populations (Brixton, Brick Lane and Soho bombings). Clinical management of blast injuries was made more difficult by the lack of civilian medical exposure to blast injuries (8). Most recently, experience in Iraq during Operation Telic with the 'corporate memory' of the Falklands Campaign and Operation Granby has provided military clinicians with reasonable experience in the management of blast injuries.

As well as blast injuries, a greater awareness of the presence and consequence of CBRN agents may also be useful, although on-scene casualty management including decontamination and antidote formulations varies between military and civilian agencies.

As well as clinical knowledge and skills, one of the most difficult tasks for a clinician at a major incident can be taking a command and control role. Military medical officers are expected to be able to command a team and their training should help equip them for these roles.

Summary

With the break up of the Warsaw Pact and changing global relations, current military deployments are becoming smaller and more expeditionary (e.g. Afghanistan, East Timor and Sierra Leone). During the Cold War, the use of weapons of mass effect was highly likely to have been seen on the battlefield. Ironically, the proliferation of CBRN agents and the knowledge of their application, as well as the manufacture of improvised explosive devices, have lead to the targeting of civilian populations by extremist groups.

One of the benefits of military clinicians embedded in NHS hospital trusts, as well as a strong reservist cadre, is a greater understanding of the implications and management of asymmetric attacks against the UK. The experience and skills of military clinicians may be of benefit to NHS trusts while this type of threat exists. Military clinicians are also likely to benefit from the experience that they get in certain NHS posts that provide skills that are readily transferable to military medicine. The events of 7th July highlighted the dynamic use of deployable medical resources and a rapid return to normal service provision. This type of 'Health Resilience' can only be achieved with a combination of effective emergency planning, on scene clinical risk management and clinical leadership.

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