

**Boston EMS**  
**House Homeland Security Committee Testimony**  
Critical Role of First Responders and Sharing Lessons Learned from Past Attacks  
June 18, 2013

**Boston Emergency Medical Services**

Boston EMS is the lead agency for the provision of emergency medical services within the City of Boston, Massachusetts and a bureau of the Boston Public Health Commission. As a municipal public safety department, Boston EMS is separate from both the Police and Fire Departments, but an active partner in the provision of 9-1-1 emergency services. In 2013, Boston EMS processed 116,637 9-1-1 emergency medical incidents, resulting in 142,341 ambulance responses and 83,144 patient transports to hospital emergency departments. The service is comprised of 375 full time positions, including EMTs and paramedics, as well as uniformed supervisors and command staff, certified mechanics, support and administrative personnel. In addition to the 24 frontline ambulances staffed during peak day and evening shifts, Boston EMS is responsible for the City's medical 9-1-1 dispatch center, which supports call-taking, dispatching and managing the region's Central Medical Emergency Dispatch (CMED) communication between EMS personnel and receiving hospitals.

**Boston Marathon and the Bombings**

The Marathon is one of Boston's largest annual special events, although less than three miles of the actual course are within the City itself. In 2013, there were approximately 27,000 registered runners, 8,000 volunteers and hundreds of thousands of observers lining the streets along the route. With the finish line in the heart of Boston, most medical assets, including both Boston EMS personnel and Boston Athletic Association volunteers, were concentrated in this area.

At 2:49PM the first explosion occurred by the finish line, at Copley Square. Ten seconds later the second bomb was detonated. Boston EMS personnel assigned to the zone by the finish area were able to immediately confirm there had been explosions. This was followed by a notification over the radio that 'two devices went off'. All units were notified to take extreme caution. Personnel at Alpha Medical Tent were told to prepare to receive patients and hospitals were notified via a disaster radio that there had been a mass casualty event. Private ambulance mutual aid was requested at 2:55PM via the Boston Area Mutual Aid network (BAMA) and the first patient was transported at 2:58PM. A total of 118 individuals were transported by ambulance in the aftermath of the bombings. Within minutes, 30 patients were categorized as critical, 25 as serious and the remainder with non-life threatening injuries. Those critical and serious patients were rapidly identified, given lifesaving treatment and quickly transported to hospitals. The patients with lower acuity injuries were transported next. The scenes were cleared in 22 minutes and the last of the non-acute patients was transported within the hour. Boston's hospitals enacted their mass casualty operations plans to effectively care for this surge of patients. In the hours and days that followed, approximately 260 patients would seek medical treatment.

**What Went Right**

While acknowledging the loss, pain and suffering still felt today by survivors and their loved ones, the medical response to the attack was a success, serving as a testament to the level of preparedness, planning and training our City and State have achieved. Everyone who left the scene alive is still alive today, a remarkable outcome given the severity and number injured.

In exploring what went right, it is imperative to first address the circumstantial elements that worked in our favor, such as 1) the proximity of the bombs to ready medical assets, 2) the availability of qualified personnel to commence rapid and appropriate triage, treatment and transport, 3) the optimal running

conditions, resulting in reduced marathon-related illnesses and injuries, allowing resources to be appropriately redirected to those injured by the two bombs, 4) the incidents occurred immediately before hospital shift change, resulting in added staffing in the midst of the patient surge. It is also important to note that Boston has 6 level-1 trauma centers, one of which exclusively serves pediatric patients (Boston Children's Hospital), allowing the most critical patients to promptly receive the care they needed. By acknowledging the elements that worked in our favor, we recognize the possibility that maybe next time they won't (for us or another City), and we plan for it.

Focusing on the elements of the response where we did have influence, it is important to highlight the years of behind the scenes planning, coordinating, drilling, exercising and training that allowed us to have the best possible outcome, given the circumstance.

#### *Homeland Security Grants*

From the time Homeland Security grants first became available to us, both the State and City have worked actively to make the most of the opportunities they have afforded. We are grateful for the years of State Homeland Security Program and Urban Areas Security Initiative funding. Many of the investments we have made with these dollars served a direct benefit in response to the bombings, including trainings, exercises, equipment and PPE.

Emergency management and homeland security grant investments in the region have a long-standing history of being inclusive of not only EMS, but also non-public safety partners, such as hospitals, health centers, long-term care centers and businesses. With most training, drills and exercises being both inter-jurisdictional and inter-disciplinary, the response to the bombings was inevitably inclusive and coordinated. Personnel utilized shared protocols, shared ICS language, and understood what and how they needed to communicate to others and what they could depend on them for.

#### *Joint Training and Exercises*

The joint trainings and exercises have been invaluable, not just for the experience of the participants, but also the many months of planning that bring agencies across disciplines together. Even departments that respond jointly on a routine basis, benefit from shared trainings and exercises to prepare for the less routine. As an example, Boston EMS trains extensively with the Boston Police Department SWAT and Bomb Squad units, so that our EMTs and Paramedics are appropriately integrated into their responses.

#### *Learning From Others*

Just as others listen and learn from our experiences, we have spent the last two decades, doing the same with other communities across the country and the world. Whether it was the terrorist attacks in London, Oklahoma, Madrid, New York, Mumbai or Columbine; or the natural disasters that swept through New Orleans, the Texas coast, and New Jersey, we critically examined what we would have done if the same were to happen in Boston. We tried to incorporate the successes we saw the other first responders implement and did our best to apply their lessons learned.

#### *Extensive Inter-Agency Pre-Event Planning*

Meetings to prepare for the race commence a year prior, with an extensive array of stakeholders, including emergency management, public health, EMS, hospitals, police and the American Red Cross. Prior to the race, the Massachusetts Emergency Management Agency hosts a tabletop exercise focused on a particular disaster scenario/race disruption. Through years of exploring what could go wrong, much was done to prepare, including pre-identified shelters, staging locations and loading areas, in addition to pre-positioned mass casualty supplies. Many of the existing plans for the Marathon, such as taking all critical patients to the back of Alpha Medical Tent, where Boston EMS had a designated treatment and ambulance loading area, worked well in response to the bombings.

*Special Events As Planned Disasters*

Over the years, Boston saw the potential for large-scale special events, such as the Boston Marathon, to not only be locations of heightened risk for attacks, due to their high profile nature and large crowds, but also serve as opportunities to implement, test and gain familiarity with NIMS and ICS practices. In fact, we began referring to special events as ‘planned disasters’, given that they inherently share many of the same characteristics. Between one and two thousand runners seek medical care at a course medical station and/or hospital during the Boston Marathon, many partner agencies are involved, streets are congested, and access can be compromised. Incorporation of the national incident management system and the incident command system, as well as utilizing equipment, resources and systems designed for large-scale emergencies helps with the overall medical consequences of the event. And, the experience provides personnel an opportunity to gain familiarity with disaster response protocols, a practice that also allows for a seamless transition if/when a real emergency arises, whether it is an evacuation at the Boston Pops Fourth of July celebration, due to a thunderstorm, or terrorist attacks at the Boston Marathon.

*There Were Ready Medical Assets that Did Not Hesitate to Render Aid*

Understanding both the potential for a significant volume of marathon-related illnesses and injuries, as well as the risk for something worse, Boston EMS personnel, other first responders and medical volunteers were heavily concentrated near the finish area. We had nearly a third of our workforce, a total of 116 EMTs and Paramedics, assigned to Zone 1, the finish area. An additional 13 ambulances, and associated personnel, were staged at the event and 26 were working city-side, two above the normal day-shift complement. When the bombs exploded there was an immediate shift to mass casualty mode. A second device had already detonated and there was a possibility of more, yet, there was no hesitation in going directly to the blast sites and expediting extraction, care and transport.

Boston EMS coordinated the care and rapid transport of 118 individual patients, distributing them across 9 area hospitals. Patients were triaged, provided essential lifesaving treatment, such as tourniquets, and transport was expedited. Boston CMED then assigned ambulances to hospitals based on their capacity and capability.

*Interoperability Worked*

When the request was sent for ambulance mutual aid support, the response was immediate. With years of coordination and shared training, they reported directly to the designated staging area, allowing for fluid loading and transport, with the most critical being transported first. Similarly, Boston EMS was able to communicate via disaster radios to all emergency departments in the City at once, as planned. When they received the notification they understood the implications and took necessary actions to prepare.

*Patient Distribution*

The survival of a patient in critical condition is dependent upon receiving appropriate care, making not just rapid transport, but also the availability and capability of the hospital, essential. Many post-disaster best practices have emerged over the years, cautioning the tendency to transport to the closest hospital. Taking note, we have spent years coordinating with our EMS and hospital partners to plan for patient distribution during a multi-casualty incident. At the end of the day, no one hospital was overwhelmed by the volume of patients they received, in response to the bombs; we consider this to be the best measure of successful patient distribution.

**What Went Wrong**

Aside from the most egregious wrong, the fact that Boston experienced a terrorist attack, three lost their lives, sixteen suffered amputations and many more were injured; Boston has spent many months evaluating how we could have done a better job.

In the immediate aftermath, there was some apprehension, confusion, and reports of other possible attacks. Transporting such a high volume of acute patients so quickly, with many unresponsive or missing identification, coupled with privacy rule restrictions on sharing information, resulted in delays for identifying some patients and reuniting them with loved ones. It did not affect the survivors' care, but the frustration experienced by their families was real.

Fortunately, most went right and we were left to wonder the 'what ifs': had the attacks occurred elsewhere, at a different time of day or if other complicating factors had been present. People speak of the Boston Standard, but ultimately, the challenge is on us to ensure we can meet that standard in other scenarios.

### **Lessons Learned**

#### *EMS Surge Capacity is Vital to Patient Survival During an MCI*

The experiences of April 15<sup>th</sup>, 2013 and the week that followed highlighted both strengths and areas for improvement in our public safety response capabilities. Speaking from the emergency medical services perspective, our greatest success also points to one of our most significant challenges. Having experienced and trained professionals on scene, able to provide immediate treatment and transport saved lives, but this EMS surge capacity was in many respects artificial; it is not part of daily operations.

EMS has a public safety role that complements the Fire and Police functions. Regardless whether EMS is imbedded within another organization, a private agency or a municipal third service, we as a country must critically examine its ability surge. As we push healthcare functions to become less costly and more efficient, reducing periods of ambulances not being assigned to calls to as close to zero as possible, we expose ourselves to a point of self-organized criticality, where we can't respond to the 'what if' scenarios. We are grateful to our private ambulance mutual aid partners, who answered the call when we requested their assistance on April 15<sup>th</sup>, but it is uncertain where ambulances would come from should an incident happen on a different day of the year. Fiscal realities affect municipal as well as private ambulance capacity and staffing.

#### *Chance Favors the Prepared*

Louis Pasteur once said, 'chance favors the prepared mind', a phrase that is well suited for the field of homeland security. Having frequently employed NIMS and ICS protocols in real incident and special event response efforts, their use was natural and automatic after the explosions. For years, we would imagine the unimaginable and then take action to expand our knowledge and capabilities in that area. We have hosted conferences on various potential threats, including improvised explosive devices, invested in medical supplies for trauma care, spent years training and drilling our personnel on triage and mass casualty incident response, and participated in multiple full-scale exercises, a number of which included blast incident scenarios and lent experience to skills in interagency coordination and patient distribution.

Initially focused on supporting the added logistical challenges associated with the central artery tunnel project, known as the Big Dig, the Boston EMS Special Operations Division, has evolved into an essential element of preparedness within the department and the City. The division coordinates medical consequence resources for over 500 special events each year, as well as providing logistical support for unplanned emergencies. Having such an integral component of the department dedicated to planning for the expected and unexpected, fosters a department-wide culture of preparedness.

#### *Training and Exercises Work*

Department of Homeland Security grant funding has been invaluable in supporting inter-disciplinary inter-jurisdictional training and exercises. The integration of public safety agencies from multiple cities and towns, as well as non-public safety partners, including hospitals and public health, has not just

increased individual staff knowledge, but has also helped agencies understand how to respond together in a collaborative manner, respecting each other's roles and strengths. The more we are able to provide opportunities for personnel to train and exercise together, the more it becomes second nature. We are appreciative of a supportive Office of Emergency management, which has prioritized such opportunities, and for FEMA for approving them.

The more responders understand the protocols and priorities of other disciplines, the more they are able to work collaboratively, in support of a shared success. International Trauma Life Support standards promote principals in trauma care for EMS that mirror combat care in the military, focusing on rapid assessment, treatment and transport; if public safety partner agencies understand this, they may better recognize how they can support this function, such as securing routes for ambulance ingress and egress from an incident to maximize patient survival.

In addition to local trainings, I can personally attest to the benefit of programs focused on strategic leadership, such as the Naval Post Graduate School, Center for Homeland Defense and Security, where I joined a cohort of local, state and federal representatives, from both public and private sectors. This executive-level program provided an invaluable opportunity to more critically examine issues in homeland security and share lessons learned with other public safety and emergency management leaders. This program serves as a reminder of how important it is to be continually learning, particularly when we work in a field where we are expected to protect the public from ever evolving threats.

#### *Planning Works*

In Boston, EMS, hospitals and public health are well integrated into planning teams. Having diverse representation for this component helps mitigate false assumptions about a discipline's capabilities and serves as an opportunity to communicate priorities that may not be readily apparent to others. By seeking value in such partners, emergency management has benefited from a broader platform of subject matter experts and built a more cohesive and prepared community.

As a coordinated effort with our private EMS partners, Boston has a regional MCI plan. And, all large-scale special events, such as the Boston Marathon have a medical consequence plan that is updated and reviewed each year. Such plans are successful because they are well practiced and adaptable. We can write planning documents, train, exercise, and invest in equipment, but ultimately, we have to trust in our personnel to improvise, adapt and overcome. If they can understand the end goal of what they are being asked to do, they won't need a scripted step-by-step guide, nor will they be daunted when a component of the plan is curtailed. In the case of the response to the bombings, we had spent much time establishing a process and protocol for designating which hospital each patient would go to; it would be done by a loading officer, who would be able to assign patients across the hospitals allowing for even distribution. With the two blast sites, the rapid load and go of patients and more than one transport location, the mechanism by which patients were assigned hospitals immediately changed to a role managed by CMED at the dispatch center, where additional personnel could support hospital assignments and even distribution across the facilities. This was not a senior command-level decision, this was everyone understanding the essential nature of successful patient distribution and taking necessary action. We have since revised our plans for complex incidents to this format.

#### *Intelligence and Information Sharing*

Much has been documented and discussed about the importance of strengthening intelligence and information sharing across federal, state and local partners, as a consequence of the bombings. In focusing on this priority, it is important to take a broader look at what constitutes the local-level intelligence community. Since 2007, Boston EMS has assigned a seasoned paramedic to the Boston Regional Intelligence Center (BRIC), the City's fusion center. He has benefited from analyst training, offered

through Homeland Security investments, although the position itself has always been paid for by Boston EMS. Having a paramedic assigned to the BRIC helps foster routine information sharing, on matters such as narcotic and violence-related incidents, and establishes a trusted partnership for sharing threat intelligence (as permitted). In addition to better connecting our two departments, our paramedic is able to serve as a broader health and medical subject matter expert, allowing for a unique perspective and contribution. There are public health emergencies that police benefit being informed of, public safety matters that may have health and medical consequences, and, given the broad scope of patients seen by medical providers, there is the potential for EMTs, paramedics, doctors or nurses to identify a potential criminal threat (either within the home of a patient or in their symptoms). Having an established avenue by which information can be shared across the law enforcement and healthcare community has been proven to have extensive benefit. EMS is uniquely qualified to serve as a bridge between the public safety and healthcare communities, as it encompasses both.

Looking more specifically within the healthcare community, we recognized the need for modeling some of the strengths and benefits of an EOC, but with a health and medical focus, allowing the 60-plus health and medical departments in Boston, including hospitals, health centers, EMS' and public health to better coordinate with each other and share information during emergencies. This idea came to fruition when we secured federal grant funding in 2008 to convert a conference room into a regional Medical Intelligence Center (MIC). Named after a former Boston EMS Deputy Superintendent, Stephen M. Lawlor, who promoted interagency collaboration, the MIC has shown much value over the years. During the Marathon and the week that followed the bombings, health and medical information sharing was supported by public health, hospital and EMS personnel assigned to the MIC.

#### *Responding to an Unsecure Scene*

Every day, EMTs and Paramedics risk their lives to save the lives of others, whether it is stepping onto an unprotected ledge, being hit, bit, spit on or even shot at. We do what we can to protect our personnel, they are trained in self-defense, they are assigned personal protective equipment, including ballistic vests, but ultimately, when they sign up for the job they understand there is a certain amount of risk. When a representative from Israel, who came to speak at a conference we hosted, was asked how they sent their personnel into unsecure scenes, knowing the risk of secondary devices, he explained that 'you do everything you can to prepare them, you try to get them in and out as quickly as possible, but ultimately, this is the job they signed up for'. The safety of our personnel will always be paramount, but when everything they are taught focuses on caring for the injured, we can expect that they will respond. This is what happened on April 15<sup>th</sup>, everyone knew the risk and they responded. Ensuring EMS personnel across the country receive necessary training and personal protective equipment is now being recognized more broadly as a priority.

#### *Planning for Others to Respond*

Just as we can expect first responders to enter unsecure scenes when there are people in need of medical care and transport, we should also plan for members of the public to respond, as we saw on April 15<sup>th</sup>. The skills of those who assisted varied, although not having a public safety or medical background was not necessarily a limitation, many asked what they could do; some were instructed on the application of tourniquets and others served vital roles in supporting patient movement. During an incident as we experienced in Boston, the initial priorities were quite simple: 1) immediate trauma care, such as the application of a tourniquet, if necessary, 2) extraction to a point where they can be loaded into an ambulance, and 3) transport to a hospital. While assistance can be helpful in the first two steps, it is important to ensure others understand that if their presence hinders any of these elements, it is best if they stay back. Congestion, particularly if it inhibits ingress or egress of ambulances, can have a negative consequence for patient survival. Ultimately, the onus is on us, members of public safety and homeland security, to ensure it is broadly understood that a disaster is defined by the impact to human life and that

for those suffering traumatic injuries, rapid ambulance transport is essential. Plans, trainings, protocols and guidance should focus on supporting these priorities, within the first response and emergency management community, as well as with the public at large.

#### *The Role of EMS Extends Beyond the Immediate Response to Injuries*

Boston EMS has been asked to speak of the immediate triage, transport and distribution of patients in the aftermath of the bombs, but what is less recognized is the role our personnel played in the events that continued throughout the week. Department personnel were assigned to the blast site for the duration of the road closure and every public event that occurred to honor those who were injured; we worked in partnership with the Boston Police Department, were on scene during each of the captures, and transported both suspects.

#### *The Value of Experienced Personnel*

At Boston EMS, our EMTs have an average of 10 years of experience on the job and our paramedics have 25 years. When we invest in training, equipment, and exercises, the experience is applied to an individual member of the department. Over time, this investment, coupled with the skills they garner from years on the job, becomes a tremendous asset to the department and the City they serve. By focusing on EMS as a career, by fully recognizing EMTs and Paramedics as public safety officers, we make our communities better prepared for potential emergencies of any scale. Boston EMS had over 140 department members provide direct care to those injured by one or both of the blasts, either directly on scene or while in transport. Even more were involved with events that transpired over the following week. Just the one day, April 15<sup>th</sup>, represented more traumatic injuries than people with more than thirty years on the job have ever seen. In the aftermath of the experience, Boston EMS' sick time went down and the injury rate went down, people worked harder and worked through what might otherwise have kept them out, because they knew they were needed. Having dedicated and highly qualified EMS personnel is something we hope our experience will lend broader recognition and appreciation for nationally. Just as we need career police officers and fire fighters, we need career emergency medical technicians and paramedics.

#### **Capturing Lessons Learned**

Boston EMS hosted two compensated internal four-hour after action meetings open to all personnel on May 2<sup>nd</sup> 2013, during the day and evening shift. A paramedic was assigned to perform more in-depth one-on-one interviews to capture additional feedback. Personnel were asked to submit any additional comments verbally or in writing, if desired. An interagency meeting with our private EMS partners, as well as attending hospital after actions, helped us draw from and better understand their experiences. A number of other after action meetings took place within the City and State.

#### **Incorporating Lessons Learned to Improve Preparation and Response to Future (or Potential Future) Events**

When we read about and spoke to the first responders from other communities who had just experienced a natural disaster or terrorist attack, we thought through what we would have done in a similar situation, but also understood that we should add any new best practices to our overall all-hazards approach. There were no planes that attacked us, no floods, no chemical agents or structural collapse, but there were many lessons learned we applied from 9-11, Hurricane Katrina and Sandy, the Tokyo Sarin attacks, earthquakes and tornadoes. It is our hope that others hearing about our story, look beyond the possibility of a bombing and draw from the many other practices that will save lives regardless the nature of the disaster.

More than anything, the experience validated much of what we were already doing. Certain measures wound up working well in response to the bombs; if they were not already built into plans, they now are. In talking to others, we also learned how their plans were influenced by expectations we had established. For example, we spent many years coordinating and exercising with hospital partners; this experience

reinforced the fact that during mass casualty incidents, EMS would use triage tags. They grew to expect this and made the determination that triage classifications assigned by EMS would be an initial guide for prioritizing patients upon receipt. When the first patients did not have triage tags, this had a direct impact on the hospitals that we had never expected. While the most critical patients were transported first, this was an important lesson learned, reinforcing the fact that we are integrally connected in the continuum of patient care. Steps have now been taken to forward deploy triage tags during special events, to increase the likelihood that tags will be applied to patients from the onset, should it become necessary.

### **Sharing Lessons Learned**

To date, presentations and speaking panels have been the principal means for communicating our experience, although we hope to complete an official after action report. Homeland Security funding was utilized to fund a Massachusetts After Action and Improvement Plan.

### **The Role of the Federal Government**

Boston EMS has long benefited from Department of Homeland Security funding, particularly Urban Areas Security Initiative grants, which have paid for training, exercises, and equipment. As a regional grant, it has helped foster regional and interdisciplinary coordination and standardization. That said, there is currently no requirement to use any homeland security grant funding to support EMS. While we have been fortunate to have a supportive emergency management office that includes EMS, we have not seen that to be consistent when we speak to our partners in other parts of the Country. We commend FEMA for making emergency victim care a priority, but ultimately, without directly tying priorities to funding and required outcomes, it is at the discretion of the local and state recipients whether or not sufficient investment is made to strengthen such capabilities. The funding has been invaluable, but the more it can focus on promoting inter-disciplinary and inter-jurisdictional coordination, the better a community will be prepared to handle disasters of all scale and scope.

### **Recommendations to Congress**

I would also ask Congress to continue support to the UASI program as it has proven value. Recognizing that disasters do happen, as much as we try to protect against them, it is imperative that homeland security be inclusive of EMS and the broader health care community. EMS as a discipline and as a critical function needs to be viewed within the lens of public safety for the purpose of homeland security. In doing so, there will be life-saving benefits on a daily basis, as well as during disasters. The fact that emergency medical services may be different in each city or town, should not diminish the importance of the function and discipline; emergency victim care is vital in any disaster; EMTs and Paramedics who operate ambulances are the first responders.

I wish to thank Chairman Michael T. McCaul, Ranking Member Bennie G. Thompson, the members of the committee, Boston Mayor Martin J. Walsh, and the Executive Director of the Boston Public Health Commission, Dr. Barbara Ferrer for allowing me to submit this written testimony.