

# Pharmacy Response to the Boston Marathon Bombings at a Tertiary Academic Medical Center

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## Abstract

**Objective:** Effective crisis response requires multidisciplinary communication and rapid action. Our goals are to highlight the experience of a pharmacy department's response to the 2013 Boston Marathon bombing, to discuss the role of the pharmacist in a crisis response, and to identify potential learning opportunities for a future mass casualty event. **Case Summary:** Our initial response targeted 3 general areas: staffing, supplies, and communication. Pharmacist and technician staffing was increased throughout the hospital, with a 6-fold increase of pharmacists to the emergency department (ED). To ensure adequate supplies were available, inventory on the ED automatic dispensing cabinets (ADC) was assessed for vaccines, antibiotics, and vasoactive medications. ED pharmacists prepared emergent intravenous medications in the ED while the sterile products room bolstered our supply of intravenous medications for patients in the ED and operating room. Overall, there was a 33% increase in the number of ADC transactions, with pharmacists representing 28% of all ADC transactions. To optimize communication, we formulated a comprehensive plan for the timely dissemination of information to the entire pharmacy staff. **Discussion:** A mass casualty event is a rare occasion, and it is vital for the pharmacy department to respond rapidly with little notification. **Conclusion:** The role of a pharmacist is unique and can most effectively triage drug information and medication distribution, especially during times of high demand and high stress.

## Keywords

emergency medicine, clinical pharmacy, quality assurance, trauma medicine, administration

## Background

Over the past several decades, the rapid increase of available drugs and the complexities of drug regimens have expanded the pharmacist's role in disaster response and emergency preparedness. Pharmacists must develop skills in drug knowledge, inventory control, and comprehensive teamwork, which can be applied to a mass casualty incident (MCI). Over the past 2 decades, the pharmacist's role in emergency preparedness has expanded in both planning and response.<sup>1</sup> The National Incident Management System and national pharmacy associations have defined the role and duties of the pharmacist in an organization's Hospital Incident Command System.<sup>2-4</sup> The following elements should be included in an institution specific emergency response plan (ERP): communication, provision of supplies, staffing, advanced training of responders, and rapid response to drug information queries.

On Monday April 15, 2013, 2 improvised explosive devices (IEDs) were detonated 11 s apart at the finish line of the 117th Boston Marathon, resulting in 3 fatalities and 264 injured survivors.<sup>5</sup> At the time of the explosions, 66 patients were being cared for in the 55-bed emergency department

(ED) at Brigham and Women's Hospital (BWH), a 792-bed quaternary care academic teaching hospital and level-1 trauma center.

At 2:54 PM, Boston Emergency Medical Services contacted local hospitals who invoked their ERPs. The first patients arrived in the BWH ED at 3:08 PM, and the first pharmacist was in the ED minutes later. By 3:20 PM, 5 additional pharmacists were in the ED. Overall, 40 survivors (age range = 16 to 65 years) were treated at BWH.<sup>6</sup>

The BWH Department of Pharmacy Services' response to the Boston Marathon Bombing focused on communication, staffing, and supplies. Effective and immediate communication within the pharmacy department and beyond was essential for a successful team response. The department received up-to-date information through the already established Hospital Incident Command System. A member

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of pharmacy senior leadership attended briefings in the Emergency Operations Center and relayed information to the department through pharmacy supervisors on-site. One barrier to effective communication was an unanticipated loss of cell tower signals. The supervisors conveyed information to staff in person or via frequent e-mail updates, which included drug information specific to IEDs, such as postexposure interventions to prevent infection with hepatitis B and C and human immunodeficiency virus, and tetanus prophylaxis.

Prompt and accurate reallocation of pharmacists and technicians to the ED, operating room (OR), central and inpatient pharmacy areas, sterile products room, and code cart room was critical. Each staffing area was assigned a lead pharmacist to optimize resources. The lead pharmacist in central pharmacy triaged staff calls and facilitated supply requests to the ED and OR. In the ED, the lead pharmacist rounded with the ED disaster team for situational updates and assessed needs, and 4 ED pharmacists were assigned to each of the automatic dispensing cabinets (ADCs) to facilitate medication distribution. This function was targeted as a high priority because of the challenges with electronic dispensing of medications to unidentified patients. A sixth ED pharmacist was assigned to caring for ED patients not involved in the MCI.

The ERP addressed supply issues directly related to the MCI and the maintenance of general supplies for inpatients while entrance and exit from the hospital was restricted. Compared to an average Monday, there was a 33% increase in the number of ADC transactions, with pharmacist dispensing representing 28% of all transactions compared with almost no pharmacist dispensing from ADCs during a regular shift. The activity of the pharmacist at the ADC reflects the need for rapid medication retrieval, inventory assessment, and requests for nonstocked medications during an MCI. Because of the nature of the MCI, there was a need for increased vaccinations, antibiotics, vasopressors, and medications for rapid-sequence intubation. The sterile products room manufactured noncommercially available medications in bulk supply, whereas patient-specific doses were calculated and prepared in the ED and OR.

The pharmacy department also encountered barriers to maintaining general supplies for admitted, non-MCI patients. The hospital was in a security lock-down during the initial hospital emergency response and the subsequent events that followed. During that time, there was an inability for outside couriers to deliver medications, such as the daily order of patient-specific total parenteral nutrition solutions, and a pharmacy supervisor had to obtain security clearance to ensure delivery.

Although our institution responded rapidly to the event, the ability to continue to provide optimal patient care to all current admitted patients was paramount. In addition to the

increased pharmacist and technician staffing in the ED and OR, it was valuable to ensure that coverage of inpatient areas received support as well. There was no disruption in pharmaceutical care to patients not associated with this event. In addition, many patients admitted as a result of the incident were transitioned from the OR and ED to the inpatient areas, increasing the flow of patients to our inpatient pharmacists.

## Discussion

A successful emergency response requires coordination, communication, and a continuity of patient care among all members of the response team.<sup>7</sup> Detailed preparation for all disaster situations might be an unrealistic challenge, but it is important to conduct drills with assigned team members to alleviate the stressors associated with an actual response and to help define individual roles. Institution-wide contingency plans and an incident command center are integral parts of comprehensive coordination.

Communication between branches of the command chain is crucial for effective dissemination of information. In this case, the interruption of cellular communication required responders to establish and access alternate forms of efficient communication, including e-mail, the hospital paging system, and direct verbal contact. This ability to adapt communication strategies ensured that personnel received timely information.

Because of the rare nature and urgency of an MCI, it is vital to implement formal ERPs benchmarked against other institutions. In the wake of the Boston Marathon Bombings, many formal and information debriefings were held throughout the hospital for quality improvement. From an institutional standpoint, 2 areas were identified that affected the department of pharmacy: improved communication outside of the ED and the display of patient names on the ADCs. From a departmental standpoint, 3 areas were identified: creating a stockpile of medications to immediately transport to the ED based on the type of MCI, increasing communication about patient-specific drug dosing and distribution from the ED to the OR and other floors, and enhanced pharmacy-specific disaster training.

Disaster response is most successful with effective communication. The ED pharmacists were alerted to the event via social media and colleagues prior to the traditional hospital emergency response alert. Because of the delay in communication of the event, the ED pharmacist was not present in the ED until 5 minutes after the first patient arrived. The absence of this key member of the emergency response team was felt by the nursing staff immediately. The large volume of unidentified patients displaying on the ADCs made it difficult for nurses to quickly dispense medications.<sup>8</sup> As pharmacy presence increased, this burden was

quickly alleviated. Our ERP should include the simultaneous notification of an event to both the pharmacy unit leader and the ED pharmacist to ensure seamless coverage of the ED.

The barrier to obtaining medications quickly from the ADCs was addressed by changing the naming convention for unidentified patients.<sup>8</sup> At the time of the event, all unidentified patients had a last name of “Unidentified” followed by a unique set of numbers. It was difficult to quickly differentiate patients on the ADC, especially in a stressful situation with multiple patients with the same last name. This naming convention has since been updated to allow for unidentified patients to be distinguished more readily. Currently, the first name of a patient is “Unknown,” and the last name has 3 identifying components separated by hyphens. These 3 components are “Unk” (for all unidentified patients), followed by M or F for the gender of the patient, and then a unique word (such as a state name, color, etc) that can be easily recalled.

The final piece of quality improvement is a focus on pharmacy-specific disaster training and the creation of an MCI-specific medication supply that can be immediately assembled and transported. The role of the pharmacist in an MCI should be predefined, similar to their role on the ED Code Team, and each member of the pharmacy and disaster team should be familiar with and understand this role.

There are many aspects of the emergency response to the Boston Marathon Bombings that made it a success. The events occurred at the finish line of the marathon, typically lined with emergency medical personnel and within miles of 5 adult and 3 pediatric level I trauma centers.<sup>7</sup> Throughout the city, ERPs were already in effect according to annual Patriot’s Day protocols to ensure the safety of the thousands of runners and spectators in the city.<sup>6</sup> Accordingly, the hospital’s emergency operations center was opened early in the morning, long before the first IED was detonated. Because Patriot’s Day is a Boston holiday, hospital census is lower than a typical Monday. The timing of the explosions was paramount to the efficiency of the response because it occurred at the hospital change of shift, allowing for immediate backup coverage for medical, nursing, and pharmacy staff.<sup>9</sup> For example, between 2:30 PM and 3:30 PM, as occurs on a daily basis, there were 8 additional pharmacists available, providing integral resources to the effort surrounding our response. It would have been more challenging to ensure comprehensive coverage without these additional staff members, and the department should plan for alternative scenarios for events that may occur at less favorable time points.

The department of pharmacy was also able to play a key role in a successful response because of our staffing model, which has a pharmacist covering the ED 24 hours a day, and many pharmacists are cross-trained and familiar with the

nursing and medical teams in the ED and drug distribution system. Although all these circumstances allowed for an “optimal” emergency response environment, it would not have all been possible without training and disaster drills for MCIs coordinated by the city and our hospital.<sup>10</sup> Hospitals should consider the absence of these elements when implementing an ERP.

## Conclusion

The role of a pharmacist is unique within the health care team. A pharmacist can effectively triage drug information and medication distribution. These tasks are part of a pharmacist’s daily responsibilities and can be efficiently managed during times of high demand and stress. As advanced training and specialization continue to occur in all areas of health care, pharmacists will also continue to adapt to the demands and needs of the health care system.

## Authors’ Note

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## References

1. Feret B, Bradberg B. A ten-year experience of a pharmacist consulting team for statewide bioterrorism and emergency preparedness. *Med Health*. 2012;95:279-280.
2. Pincock LL, Montello MJ, Tarosky MJ, Fierce WF, Edwards CW. Pharmacist readiness roles for emergency preparedness. *Am J Health Syst Pharm*. 2011;68:620-623.
3. American Society of Health-System Pharmacists. ASHP statement on the role of health-system pharmacists in the emergency preparedness. *Am J Health Syst Pharm*. 2003;60:1993-1995.
4. National Center for Injury Prevention and Control. *Interim Planning Guidance for Preparedness and Response to a Mass Casualty Event Resulting From Terrorist Use of Explosives*. Atlanta, GA: Centers for Disease Control and Prevention; 2010.
5. Biddinger PD, Baggish A, Harrington L, et al. Be prepared: the Boston Marathon and mass-casualty events. *N Engl J Med*. 2013;368:1958-1960.

6. Goralnick E, Gates J. We fight like we train. *N Engl J Med*. 2013;368:1960-1961.
7. Walls R, Zinner MJ. The Boston marathon response: why did it work so well? *JAMA*. 2013;309:2441-2442.
8. Kowalczyk L. Hospitals size up the lessons of Marathon attacks: chief among concerns: accurately identifying patients amid chaos. *Boston Globe*. Published online July 28, 2013 Available at < <http://www.bostonglobe.com/lifestyle/health-wellness/2013/07/27/boston-hospitals-confronted-challenges-identifying-patients-after-marathon-bombing/7fF-WuivM3tTKbIFAYn1BIJ/story.html>>.
9. Conn A. Marathon day at Massachusetts General. *Ann Intern Med*. 2013;159:143-144.
10. Thompson CA. Boston bombing put hospital pharmacies into emergency mode. *ASHP Pharmacy News*. Published online: April 19, 2013. Available at < <http://www.ashp.org/menu/News/PharmacyNews/NewsArticle.aspx?id=3890>>