Massachusetts General Hospital
Boston Marathon Bombing
Response and Recovery

October 4, 2013
Overview

• Discuss existing MGH and Boston planning and systems
• Identify lessons already learned before April 15th
• Review Boston Marathon bombing response
• Examine the citywide lockdown on April 19th
Emergency Preparedness Plan at Mass General

- Combines internal and external disaster plans into one “umbrella” plan
  - All MGH departments have a formal plan
- All-hazards approach to manage any incident
  - Additional “annexes” focus on specific threats and their unique qualities (e.g. MCI, HAZMAT, bio-threats, radiation, evacuation)
- Adopts the use of the Hospital Incident Command System (HICS)
- The substance of the plan does the following:
  - Identifies “CODE DISASTER” as phrase to activate disaster response
  - Describes the concept of operations for disaster response
  - Outlines the authority to obtain resources for disaster response
  - Describes coordinating activities with external community agencies
MGH Specialty Responses

- Specialty plans have been developed to respond to unique situations that require pre-planning coordination:
  - Nuclear/Radiological
  - Chemical/Hazmat
  - Infectious Diseases
  - Hospital Evacuation
  - MCI protocol
  - Mass Screening Process
  - Hospital Surge

- Special Considerations:
  - Facility “lockdown” (controlled access) procedures for MCI
  - Special evidence handling procedures for contaminated articles
  - Building evacuation plans that differ from the “fire” plan
Conference of Boston Teaching Hospitals – Emergency Preparedness Coalition

- COBTH is a trade association composed of 14 member Boston hospitals

- Emergency Preparedness Committee
  - Brings together all of the Emergency Preparedness Coordinators from those hospitals to discuss hospital readiness, regional planning, and exercises
  - The EP Committee also address gaps within planning and creates strategies to improve those plans

- The COBTH Emergency Preparedness Coordinator and two individuals from the Office of Public Health Preparedness act as the Region 4C (Boston) Hospital Coordinators.

- COBTH has many other functions including government relations with the hospitals, a CEO’s committee and a Domestic Violence Committee. It acts as a cohesive lobbying unit for the Boston Hospitals
Boston Healthcare Preparedness Coalition
Medical Intelligence Center

- Conglomeration of healthcare entities come together to discuss pertinent preparedness issues for the region
- Members of this coalition include, but are not limited to: Hospitals, Healthcare Centers, Long-term Care, Coalition for the Homeless, Home Health Agencies
- Within the coalition there is a Training and Exercise Workgroup that coordinates and guides curriculum at the DelValle Institute
- Medical Intelligence Center (MIC) is staffed during an incident to give hospitals a conduit to the MEMA (Mass Emergency Management Agency) incident command desk and act as a liaison to other local, state, and federal agencies
MA DPH Emergency Preparedness Bureau

- Formalized in 2007
- Serves as the ESF-8 lead for all health entities in Massachusetts during emergencies
- Assists with planning and coordination activities pre-event:
  - Community-based planning
  - MA Responds
  - SNS management
  - Coalition support and development
  - Planning for individuals with access and functional needs
  - Exercises and training
  - Other activities
Exercises and Trainings

• In the past 5 years MGH has conducted over 150 exercises and training sessions
  • Weekly New Employee Orientation Session
  • Administrator On-call training and continuing education
  • 10-15 tabletop, functional, or full scale exercises per year

• Participants include:
  • Materials Management, Environmental Services, Patient Care Services, Emergency Departments, Perioperative Services, Buildings and Grounds, Engineering, Information Systems, Telecom, Police & Security, Safety Department
  • External partners: Boston Police Department, Boston EMS, Boston Fire department, and other local and regional hospitals
Patient Evacuation Exercise
HAZMAT Decontamination Exercise
HAZMAT Decontamination Exercise
Lessons from Colleagues Imbedded in MGH Plan

- We had learned key lessons from colleagues who have experience managing similar events
  - Israeli disaster management conference in 2005
  - Aurora, CO mass shooting incident
  - Medical staff members with military experience
  - MCI research
  - Harvard School of Public Health
  - Deployment experience (DMAT, IMSURT)
Lessons from Colleagues Imbedded in MGH Plan

- Notification interval will be very short, if it exists at all
- Early information will be inaccurate, incomplete, or both
- Patient distribution may be uneven
- Patients will arrive by mechanisms other than EMS
- The ED and hospital will likely be full
- Many response actions have to happen very, very quickly
- Triage must be brief, but must also be repeated
- Chaos and disorganization are inevitable, but must be managed as quickly as possible
- Practice is essential
The Boston Marathon
The Boston Marathon, Monday, April 15, 2013

- 117th Boston Marathon
- 26.2 miles
- 26,839 runners
- Over 500,000 spectators
- Coincides with a Red Sox home game
Boston Marathon Bombing Notification

• At 2:50 pm two explosive devices were detonated near the finish line of the Boston Marathon

• At 2:55 pm Boston EMS and COBTH disaster radios transmitted notification of the explosion to all area hospitals. Additional notifications reported casualties

• Hospital CODE DISASTER activated at 3:03 pm. Disaster plan and mass casualty protocols implemented

• Hospital Emergency Operations Center (EOC) opened in administrative conference room per plan

• First patient arrived at 3:04 pm
Non-Traditional Notification and Early Situational Awareness

- Twitter and Facebook posts from the scene immediately picked up by some hospital personnel
- Text messaging
- Cell phones
  - Communication from the incident site (temporarily disabled)
  - Provided photos, video, GPS
  - Improved incident command communication
- MGH utilized homepage, Twitter, and Facebook to push updates and status reports
Scene Response
Scene Response

- Medical tents were staged at the finish line to care for injured runners
- EMS and other medical responders rushed to the scenes to attend to victims
  - Some victims moved well away from the initial blast area
  - Significant bystander efforts as well
- Victims received mostly BLS interventions
  - Open airway
  - Control hemorrhage (largely with tourniquets)
  - Transport
EMS Response

• Updated command and area hospitals with situational awareness data
• Numerous additional EMS units mobilized by Boston EMS
• Loading officer managed most of the transport destination decisions
  – Scene was cleared of critical victims in 18 minutes
  – Numerous victims transported 2, 3, 4 per ambulance
• Some area hospitals established ambulance resupply carts in their ambulance bays
Patient Arrivals at the Hospital

• Hospitals along the marathon route had been receiving some usual Marathon-related patients throughout the day (dehydration, dizziness, sprains/strains)

• First bombing related patients arrived at affected hospitals shortly after 3:00 pm

• Additional patients with amputations, open fractures, multiple trauma, and extreme blood loss

• Patients with limited minor injuries continued to arrive into the evening and for several days after the incident
### First MGH Patients

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Patient Injuries

- Multiple below and above the knee amputations
- Severe blood loss
- 2\textsuperscript{nd} and 3\textsuperscript{rd} degree burns
- Open fractures, open wounds, lacerations, embedded shrapnel with tissue injury
- Closed fractures with contusions, sprains and strains
- Head injuries, post-concussion syndrome
- Hearing loss with tympanic membrane injury
- Acute anxiety
Acute Hospital Response

- The Acute area of the Emergency Department was cleared of all existing patients to make room for the injured.
- Existing ED boarders were quickly accepted by inpatient units with limited handoff to decompress the ED.
- Triage disaster protocols implemented and led by ED attending physicians. Trauma teams staged outside of each bay:
  - External triage on the ambulance ramp staffed by EM MD and RN
  - Internal triage area created in ED waiting room.
- Perioperative services reserved several operating rooms for expected incoming cases. Anesthesia, nursing, and surgical teams alerted staff:
  - Six patients underwent surgery within 30 minutes of ED arrival.
- Security secured the ED, ambulance bays, and front entrances.
• ED volume decreased 97 to 39 patients within 1.5 hours
Collaboration and Practice

- Boston EMS did an outstanding job distributing patients to local hospitals and trauma centers so that no hospital was inundated with complex critical patients
  - 275 total injured, well distributed based on acuity
- Regular large drills and trainings including emergency response, emergency notification, HICS roles, and flexible incident command
  - Previous exercises have included airplane accidents at Logan, train crashes and incidents involving hazardous materials
  - Longstanding, collaborative relationship between State and City agencies and Boston teaching hospital
• Significant professional medical presence at the finish line
Mitigating Factors

- This event occurred during the day near shift change, which facilitated the response (essentially double coverage of staff). Emergency plans need to consider rapid 24/7 response when staffing will be more limited.

- Bombs were detonated outdoors and did not cause any structural collapse requiring extrication.

- Bystanders on scene immediately assisted the injured.

- Finish line staffed with emergency responders and medical tents.

- Close proximity to 6 level-1 hospital trauma centers (BIDMC, BMC, BWH, Children’s, MGH, Tufts).
At 6:00 am residents of Boston and adjacent communities told to stay home, not report to work, and shelter in place

All public transportation shut down

Hospital CODE DISASTER called
Shelter In Place--Considerations

• The unprecedented Shelter In Place order presented unique challenges and valuable learning opportunities
  – Staffing shortages due to public transportation shutdown created significant challenges
    • EP leadership investigating ways to use PHS transportation assets in future events
  – The decision to cancel/reschedule ambulatory visits is complex and requires preplanning
    • Organizations should ensure contact information (cell phone, home phone) is available for leaders of all ambulatory areas
  – Efficient use of the Labor Pool requires detailed planning and ongoing support
    • Must communicate early and often during an incident to ensure essential staff stay on site until released
Additional Considerations--Shelter in Place

- Securing hospital access is complicated and requires significant resources from Security staff
  - Major impact on staff, patients, families, visitors, and deliveries of hospital supplies
- Inpatient discharges will be close to zero
  - Major impact on ED, ORs, and other procedural schedules
- Onsite staff may not be relieved: sleeping arrangements will be necessary
- Ongoing, repeated clarifications needed from State authorities
  - Essential healthcare workers
  - Ambulance traffic to and from hospital
Days Following the Bombing

- Assess long-term impact on patients
  - Consider psycho-social support needs after initial euphoria of surviving
  - Anticipate long-term, significant rehabilitation needs

- Assess impact on staff
  - Expect increased stress
  - Mobilize EAP (Employee Assistance Program) resources
  - Open communication; hold multiple debriefings

- Unexpected outpouring of support for patients, families, staff
  - Manage visits by dignitaries (POTUS, governor, other politicians, sports celebrities, etc)
  - Wonderful cross-hospital support
Initial Lessons

• Internal notification issues were complex
  – Leadership personnel versus critical staff
  – Use of social media
  – Confirmation of HAZMAT information

• Important to streamline ICS use/structures

• Ongoing communication issues with all staff, public, media
  • Challenging to maintain updated situational awareness

• Need to review disaster patient registration process
  – Similar MRNs
  – Unreliability of information
Initial Lessons

• Need to continue our development of MCI protocol
  – Important to partner ED and surgery leadership
• Manage Emergency Department crowding during event
• Patient/family reunification
• Law enforcement issues with interrogation of patients, families, visitors
Areas for Improvement

• Public transportation challenges
• Labor pool management
• Ongoing inpatient hospital operations
• Ongoing ambulatory hospital operations
• Communication with research community
• Release of information process/procedures; HIPAA
• Ongoing employee support (PTSD)
• Recovery, business continuity, tracking of expenses
  – Employee pay policy modification
Areas for Long-Term Development

• Advocacy for funding related to emergency preparedness
  – Federal and state funds that support drills, EMS coordination, and hazmat training and supplies have diminished. ASPR (Assistant Secretary for Preparedness and Response) funding has been reduced
  – Concern for being able to maintain, improve, and enhance emergency preparedness and response

• Continued focus on integrated planning, multidisciplinary exercises, and a variety of drills (MCI, hazmat, technology and communication systems failure)