Boston Marathon Bombing Response and IT Implications “Lessons Learned”

September, 2013
IT Considerations

- Planning and Preparation
- Stabilization
- Communication
- Patient Identification & Past History
- Public Communication & Media Support
- Evaluation
Partners Healthcare
Planning and Preparation

“From a tactical perspective, the tragedy that occurred at the Boston Marathon and its aftermath reinforced the importance of having a planned approach to emergency preparedness and business continuity planning.”

Jim Noga, CIO Partners HealthCare

“Like many organizations, Boston Children’s Hospital trains for a myriad of emergencies. We have a very detailed hospital incident command system, HICS, in which key departments are always at the ready. Information technology is just one of the many HICS command positions which are on-call at all times. Anytime an incident is declared, the overall 'incident commander' will contact the entire HICS team and within minutes, we are connected to discuss the specifics and assignments are given. Shortly after the incident occurred, the entire team of HICS leaders was on a conference call mobilizing staff and putting plans into action”

Scott Ogawa, CTO and deputy CIO, Boston Children’s Hospital
Hospital Incident Command System (HICS)

Incident Commander

Public Affairs Officer
- Safety Officer
- Security Officer
- Emergency Medicine Advisor

Logistics Chief
- Facility
- Environmental services
- Biomedical
- Information Systems
- Engineering

Planning Chief
- Labor Pool
- Volunteers
- Medical Staff
- Situational status
- Patient Tracking

Finance Chief
- Claims
- Time policy
- Cost/Procurement

Operations Chief
- Inpatient Units
- Adult care
- Maternal/Child care
- ICU
- Ambulatory care
- Case management
- Emergency Department
- Operating Rooms
- Ancillary Services
- Psychological Care
- Families
- Employees

Advisors:
- Biological Nuclear Hazmat
City and State Partners

- COBTH (Conference of Boston Teaching Hospitals) 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

- Boston Healthcare Preparedness Coalition Medical Intelligence Center
  - Members of this coalition include, but are not limited to: Hospitals, Healthcare Centers, Long-term Care, Coalition for the Homeless, Home Health Agencies
  - 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
Patient Evacuation Exercise
HAZMAT Decontamination Exercise
Lessons from Colleagues

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

- Expect little or no notice before first patient arrives
- Increase the speed of triage
- Manage patient distribution at site via EMS network ("red" patients) so no single hospital is overwhelmed
- Initiate immediate tourniquet use for hemorrhage control
- Start decompressing ED and ORs before the first patient arrives
- Do not underestimate psychological trauma
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.

First Response
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

- Partners hospitals utilized homepage, Twitter, and Facebook to push updates and status reports

- “Most important is that communications channels stay open, whether that be telephone, e-mail or pager. Keeping communications channels open is most important during a crisis.”  Jim Noga
## First MGH Patients

<table>
<thead>
<tr>
<th>Date of arrival</th>
<th>Time of arrival</th>
<th>Status</th>
<th>Injury</th>
</tr>
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<td>L HAND INJ</td>
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<td>Admitted</td>
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<td>Admitted</td>
<td>SHRAPNEL/FOOT</td>
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<tr>
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<td>3:27:00 PM</td>
<td>Discharged</td>
<td>EXPLOSION INJ</td>
</tr>
<tr>
<td>4/15/2013 15:27</td>
<td>3:27:00 PM</td>
<td>Discharged</td>
<td>EXPLOSION INJ</td>
</tr>
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<tr>
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<td>DISASTER</td>
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<tr>
<td>4/15/2013 16:00</td>
<td>4:00:00 PM</td>
<td>Discharged</td>
<td>DISASTER</td>
</tr>
<tr>
<td>4/15/2013 16:22</td>
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<td>4:32:00 PM</td>
<td>Admitted</td>
<td>EXPLOSION</td>
</tr>
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</table>
Patient Injuries

- Multiple below and above the knee amputations
- Severe blood loss
- 2nd and 3rd 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
## Partners Healthcare Volume

<table>
<thead>
<tr>
<th>Organization</th>
<th>Patient Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brigham and Women’s Hospital</td>
<td>39 patients treated, 16 admitted</td>
</tr>
<tr>
<td>Brigham and Women’s Faulkner Hospital</td>
<td>14 patients treated, 5 admitted</td>
</tr>
<tr>
<td>Massachusetts General Hospital</td>
<td>39 patients treated, 12 admitted</td>
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<tr>
<td>Newton Wellesley Hospital</td>
<td>2 patients received, all treated and released</td>
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<tr>
<td>North Shore Medical Center</td>
<td>6 patients received, all treated and released</td>
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</tbody>
</table>
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
  - 264 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
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
  - Remote Access to IT systems
“Going into a major event of this type, it is necessary to ensure the stability and availability of systems and focus on steady state, rather than change, to make sure the necessary IT resources are available to the clinical and operational teams.” Jim Noga, CIO Partners HealthCare

“From an IT perspective, maintaining a high bandwidth, reliable and secure infrastructure was key. The demand for communication – voice, email, social media and streaming video was very high. The scalability built into the design of all our systems – networks, servers, storage, and client devices – served us well.” John Halamka, MD, CIO Beth Israel Deaconess Medical Center
Communications

“Most important is that communications channels stay open, whether that be telephone, e-mail or pager. Keeping communications channels open is most important during a crisis. We also understand that it may be likely that the number of remote users may increase significantly due to inability to gain physical access to the workplace. As a result, having a plan in place to use under those circumstances is vital”

Jim Noga, CIO Partners HealthCare

“The role of IT was primarily to facilitate communication.”

CIO Daniel Nigrin.MD CIO Boston Children’s Hospital

“In a disaster as devastating as what transpired this week at the Boston Marathon, health information technologies and mobile devices can play a critical role in the timely transmission of vital data and long term patient care and monitoring,“

Chuck Parker, executive director, Continua Health Alliance
“The need for healthcare information exchange in a mass casualty disaster is very clear," he says. "When patients have a choice of caregiver - a patient-centered medical home or accountable care organization - a lifetime medical record is likely to be available, supporting safe, quality, efficient care. But that's not necessarily the case in an emergency, especially a disaster. The events of last week required patient routing based on acuity, urgency and availability of resources.

Area hospitals "did a remarkable job treating every patient even with incomplete medical information. Last week's tragedy, however, illustrates the importance of the second phase of the statewide HIE. That phase will offer secure retrieval of information based on a record locator service and a patient consent registry. The Massachusetts Healthcare Information Exchange now can only accommodate "pushing" summaries from organization to organization. But advanced services are coming soon."

John Halamka, MD, CIO Beth Israel Deaconess Medical Center
Evaluation

- Notification to HICS personnel versus critical staff
  - Phone trees

- Communication to all staff; public affairs
  - Social media

- Disaster patient registration process

- Emergency Department crowding during event

- Triaging patients

- Patient/family reunification

- Psychological first aid; ongoing support

- Law enforcement interrogation of patients, families, visitors

- Possible IT Intervention
Evaluation

- 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

Possible IT Intervention
“While we have our job to do, we are subordinate to the overall emergency preparedness response team and its leadership. Specific to supporting the response team, the monthly testing of equipment in our incident command centers is crucial to activating the incident command center when needed. It is also important to make sure key 24/7 operations are appropriately staffed, and that there is a formal process to track staffing of these activities.”

Jim Noga, CIO Partners HealthCare
Bibliography


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