The Boston Marathon Bombings: Health System Response & Recovery

Annual DPHP Meeting
October 8, 2013
Overview

- MASSACHUSETTS LANDSCAPE
- PRE-PLANNING
- 2:50 PM, APRIL 15, 2013
- APRIL 16TH & BEYOND
- QUESTIONS
Massachusetts Landscape

- 6.6 million residents
- 1 State Health Department
- **Home Rule: 351 Local Health Authorities & EMDs**
  - 7 Public Health Preparedness Regions, 15 sub-regional PH Coalitions
  - Multiple overlapping regions & planning groups
- **74 Acute Care Hospitals**
  - 6 Hospital Preparedness Regions
  - 7 Level 1 Trauma Centers; 3 Level 1 Pediatric Trauma Centers
- **60+ Community Health Centers**
- **500+ Long-term Care Facilities**
Emergency Preparedness Bureau

• EPB works in collaboration with other DPH bureaus and state agencies, local health, healthcare, EMS, emergency management, public safety, & community-based organizations to protect the health of Massachusetts residents by ensuring effective consequence management and recovery from health & medical emergencies

• Mitigation, Planning, Preparedness, & Response
  • Regional preparedness coalitions – regional support for local response
  • Strategic National Stockpile assets
  • Fatality Management (with MEMA and OCME)
  • Mass Casualty Incidents response
  • Medical Surge in Healthcare Settings

• Health & Homeland Alert Network (HHAN)

• Health Volunteer Programs – local MRC & statewide MA Responds
Pre-Marathon: Planning for a Mass Casualty Incident

- Multi-agency, multi-disciplinary planning process
  - State agencies
  - 8 communities along route
  - Private organizations – Boston Athletic Association (BAA); Red Cross
  - Detailed ops plan & medical manual

- MA DPH Role: EPB and Office of Emergency Medical Services (OEMS)
  - BAA Medical team
  - Enhanced medical tents
  - Hospitals
  - Ambulance services (public & private)
Medical Considerations

• 26.2 mile course
  • 27,000+ runners (registered + bandits)
  • 500,000± spectators

• Expect > 1,000 runners & spectators will require medical care
  • Dehydration
  • Blisters
  • Exercise-related heat illness – cramping, heat syncope, exhaustion, heat stroke
  • Over hydration
  • Debilitating Muscle Spasms
  • MI
  • Stress Fractures
  • Intoxication
Marathon Medical Resources (2)

- Medical & support services from Hopkinton to Boston
- 26 medical tents
  - 10 enhanced tents on course with ambulance support
  - Tents A & B at finish line
- 16 ARC first aid stations
- 49 hydration stations
- MCI trailers positioned mid-course
- Medical sweeps buses
MA DPH Role

• EPB & OEMS staff at SEOC and DOC
  • Baseline bed count
  • Pre-set conference calls with hospitals along the route & in Boston
  • Monitor public safety radio traffic
  • WebEOC – MA DPH, MEMA, Boston

• Along the course – situational awareness
  • Staff at enhanced medical tents along route monitor capacity
  • Staff at Finish Line medical tents monitor influx of runners
What We Knew, When

• Communications
  • EPB staff at finish line notified ESF-8 desk/DOC of explosions at 2:52
  • CMED alert to Boston hospital emergency rooms at 2:54
  • HHAN alerts to Boston hospitals & Conference of Boston Teaching hospitals at 2:59
  • HHAN alert to hospitals in region surrounding Boston by 3:02

• Coordination
  • Medical Intelligence Center (MIC)
  • DOC
  • SEOC
Hazardous Materials?

• Quickly ruled out on scene – but not well communicated
• Bio Unlikely
• Chemical most dangerous – would show symptoms
• Radiological
  • Monitoring on scene
  • At hospitals
Significant professional medical presence at the finish line
Monday April 15 - Medical Systems Response

- Triage: Boston EMS & CMED
  - 30 red tag patients transported within 18 minutes
  - Remaining patients transported within 45 minutes
  - Patients evenly distributed by severity & absolute numbers – no single hospital overwhelmed
- MGH received first patient 14 minutes after explosions
  - 5 critically injured patients into full ED, but all evaluated & sent to OR within 8 minutes of each other
- B&W had its 1st patient in OR within 35 minutes of blasts
Monday April 15 - Medical Systems Response (2)

- Hospitals
  - 6 level 1 trauma centers within 2 miles of blasts
  - Well practiced surge plans
    - B&W: 78 surge deployments in past 8 years
  - Cleared EDs and ORs, which were actually busy
  - Kept first shift in place to augment staffing; off-duty personnel came in
  - Benefited from collaborative planning among hospitals, BPHC, BEMS, COBTH, MA DPH
  - B&W Incident Commander: “I mostly let people do their jobs”
# First MGH Patients

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Source: Mass General Hospital
Emergency Department Decompression

ED volume decreased 97 to 39 patients within 1.5 hours

Source: Mass General Hospital
Patient Injuries

• Multiple below & above the knee amputations
• Severe blood loss
• 2\textsuperscript{nd} & 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
April 15 & Beyond -Operation Centers Coordination

• MIC: BPHC & BEMS
  • Central coordination point within Boston
  • Monitored BEMS, advised Boston hospitals about incoming patients
  • Central point for collection of patient information

• DOC: DPH
  • Ongoing communication with partners via HHAN and listservs
  • Blood supply delivery
  • Requests for amputation & vascular kits
  • Communication with surrounding states for transfer of patients who would otherwise have gone into Boston

• MA DPH staff in DOC & co-located at MIC 4/15 - 4/26
April 15 & Beyond – HHAN Communications

- Alerting system developed by MA DPH and Children’s Hospital
  - Statewide, regional, local & by discipline
  - Alerts via telephone, email, pager
  - Used by public health, emergency management, & public safety
- Used routinely for communication during Marathon
  - Used for initial alerts; during lockdown
  - 106 messages sent 4/15 through 4/19
  - 63,788 pings across all user groups
- Post-Marathon - dissemination of mental health resource info
April 16 & Beyond - Patient Distribution Across Hospitals

• Worked with Boston to gather information to support family reunification
  • Cross-jurisdictional challenges with patient tracking
  • Victim Assistance Center
  • Requests for hospital release of patient information

• 281 patients treated for injuries in 25 hospitals in & around Boston
  • Boston (Region 4C): 235 patients/10 hospitals
  • MetroWest (Region 4AB): 14 patients/7 hospitals
  • North Shore (Region 3): 20 patients/4 hospitals
  • South Shore (Region 5): 9 patients/2 hospitals
  • Central MA (Region 2): 3 patients/2 hospitals
April 16 & Beyond - Mental Health Supports

- 207 Sessions Held
  - Thousands served
  - 600+ hours

- Service Providers
  - Boston Public Health
  - Mass. Dept. of Mental Health
  - U.S. Health & Human Services Mental Health Team
  - SAMHSA Disaster Hotline
  - Riverside Community Care
  - American Red Cross
  - Salvation Army
  - Israel Trauma Coalition

- Audiences
  - BAA Staff & Volunteers
  - EMS
  - Public Safety
  - Schools
  - Hospitals
  - Community Events
  - Residents throughout MetroBoston

- Ongoing
  - Support at subsequent events
  - Planning for 2014
Thursday, April 18 - Suspects in the Crowd
Friday, April 19 - Lockdown

• Shelter in Place
  • Boston, Watertown, Cambridge, Newton, Waltham & Belmont

• Impact
  • Transit system shutdown
  • Hospitals
    • Security
    • Staffing
  • EMS
    • Security
  • Home health
  • Prescription meds
Factors That Affected Initial Response

• Confluence of factors
  • Level 1 trauma centers in Boston
  • Timing: change of shift

• Medical resources pre-positioned on site
  • Boston EMS – tourniquet protocols
  • Med tent personnel
  • Bystanders on scene immediately assisted the injured
Factors That Affected Initial Response (2)

- Area roads closed off for event
- Operations centers up & running for event
- Bombs detonated outdoors & did not cause structural collapse requiring extrication
- Partners had worked together in multiple cross-disciplinary exercises & response to real events
Ongoing Activities & Impact

• After Action Items
  • Patient tracking
  • Federal mental health ConOps
  • Requests for release of info by hospitals
  • State AAR Process

• Recovery

• Heightened planning for subsequent events
  • 4th of July

• Planning for 118th Boston Marathon
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