Managing Patient Information during a Mass Casualty Incident
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Conflict of Interest

Adam Landman, MD
Has no real or apparent conflicts of interest to report.

Jonathan M. Teich, MD, PhD
Has no real or apparent conflicts of interest to report.
Learning Objectives

Define a mass casualty incident including the key information-sensitive workflows during these events

Identify areas where information stress and potential errors and inefficiencies can occur during a mass casualty incident compared to usual operations

Assess information management capabilities and resources you will need to plan for and handle mass casualty incidents

Define solutions and procedures that can avoid such errors and optimize rapid critical patient management

Prepare for a potential mass casualty incident by organizing training and drills including exceptional information needs
## Benefits Realized in the STEPS Framework

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Mass Casualty Incident

“a destructive event causes so many casualties that extraordinary mobilization of medical services is necessary”


Types of MCIs

- Fire
- Explosion
- Structure collapse
- Vehicle / vessel accident
- Multiple shooting
- Poisoning / irritant (oral or airborne)*
- Radiation*
- Infectious illness*

Recent Examples

- Aurora, Colorado movie theater shootings
- Texas fertilizer plant explosion
- San Francisco/Asiana plane crash
- Boston Marathon bombings

*Caregiver hazard affects flow
MCI Information Management

- There are common themes in disaster information management
- It should be possible to anticipate needs and prepare in advance
- Desired features:
  - Quick to deploy and learn
  - Emphasize quick and repeatable procedures
    - Triage, blood ordering, etc.
  - Provide guidance to facilitate excellent care by clinicians facing unfamiliar circumstances
  - Support measurement and post-event assessment

What is ideal? What is practical?
Global MCI information improvement opportunities

- Track patients
- Reduce errors due to increased volume
- Manage department personnel and resources
- Facilitate accurate real-time situational awareness
- Enhance clinical communication
- Keeping calm and methodical


Clinical Workflow

A Pre-encounter
B RN and MD History/Assess
C Formulate Care Plan
D Docum’n
E Orders / Rx
F Order Handling & Med Admin
G Therapies / Procedures
H Results and New Events
I Consult Request
J Disch’ge & Referrals
K Post-Visit / Home Care

Bottlenecks during a MCI

117th Boston Marathon: April 15, 2013

2:50 PM
Incident Geography

Photo Credit: Chiqui Esteban, Gabriel Florit, Alvin Chang / Boston Globe
Incident Geography: Hospitals

- St. Elizabeth's Medical Center: received 18 patients.
- Beth Israel Deaconess Medical Center: received 24 patients.
- Boston Children's: has seen 10 patients, with three still hospitalized.
- Brigham and Women's Hospital: has seen 31 patients, five of whom are critical.
- Tufts Medical Center: received 23 patients, none of whom had life-threatening injuries.
- Copley Square: Staging area for casualties.
- Mass General Hospital: received 29 patients, eight of whom are critical.
- Boston Medical Center: treated and released five patients.
- Carney Hospital: saw seven patients, all of whom have been treated and released.
- Mount Auburn Hospital: received 13 patients.

Learn more at: advisory.com/daily-briefing or follow @daily_briefing on Twitter
2:51 – 3:20 PM
2:54 BWH Notified of Event
Disaster Plan Activated
Brigham and Women’s Hospital (BWH)

- 779 bed Academic Medical Center
- Level 1 Adult Trauma Center and Burn Center
- 60,500 annual ED visits
- 47,000 inpatient admissions
EDIS Supports ED Workflows
Electronic Order Entry

![Electronic Order Entry Form](image-url)
Provider Electronic Documentation

History of Present Illness

- Date/Time of Arrival: 11/13/2013 7:56 AM
- First Time Seen by a Provider: [ ] AM [X] PM

Patient Stated Chief Complaint: TRAUMA

Complete hx limited by: [ ] ALOC [ ] Dementia [ ] Severity of Illness [ ] Other

History Obtained From: [X] Patient [ ] Family [ ] MD [ ] EMS [ ] Other

Interpreter Used: [ ]

Trauma

TRAUMA [ ] Code Alpha [ ] Code Trauma Clear

Mechanism of Injury: Please Select

HPI

120 year old male a/p blunt trauma from explosion.

Pre-Arrival Events (EMS and/or Transferring Hospital)

Section Complete: [ ]
Typical ED Patient Arrival Workflow

Patient Arrives
- Registration staff establish patient identity
- Match to prior records

Check-in

Triage
- Nursing assessment
- Route to next available treatment location
Trauma Patient Arrival Workflow

Patient Arrives
EMS Notification
Registration staff assign unique, unidentified patient name and MRN
Unidentified, ABC Male

Trauma Evaluation
Rapidly evaluated by interdisciplinary trauma team

Merging
Registration staff identify patient
Update Name
Merge with prior records, if available

- Critically ill patients (or unknown) patients
- Unable (or no time) to perform check-in
These systems and workflows have worked well during busy daily operations
BWH Patient Arrivals
First 15:08
Incident Summary

- All BWH Boston Marathon Patients did well
  - 39 Survivors
    - 16 Admitted
    - 9 Required Emergent Surgery

- We were fortunate
  - Preparedness for event
  - Time of day

- We debriefed and improved our systems and workflows
Usual Procedures were Overwhelmed: Information Systems were a Key Bottleneck

1. Limited situational awareness of patient location
2. Difficult to distinguish unidentified patient names
3. Lack of real-time documentations of orders, assessments, and procedures
Registration Supervisor Anticipation

- Pre-registered Unidentified Patients
Registration staff placed unidentified trauma packet on stretcher as ambulance stretches immediately directed to patient rooms

Photo Credit: Broward Health Coral Springs: http://www.browardhealth.org/?id=1771&sid=5
Patient tiles on tracking board not moved to correspond to patient’s physical location
Patient tiles on tracking board not moved to correspond to patient’s physical location
Unidentified patient names difficult to distinguish on the tracking board

First Name: XYZ (where XYZ is unique letter combination)
Last Name: UNIDENTIFIED
Providers focused on Patient Care
Bottlenecks during Boston Marathon Bombings at BWH

Unidentified Patient Naming Strategy

- First Name: Unknown
- Last Name: Unk-M-YYY

where YYY = unique phrase
Improve Real-time Documentation

• Assign Staff as Scribes

Photo Credits: Nat Clymer Photography, [http://www.natclymer.com/#/healthcare/Trauma_Team](http://www.natclymer.com/#/healthcare/Trauma_Team)
Clinical decision support to simplify decision-making

• Order sets based on type of incident
  – Blood? Burn care? Hydration?
  – Teams needed
• Smart status board / prioritization
  – Find unusual delays
  – Balance teams and units
• Alerts for new significant events
• Auto-paging and virtual pagers
• Patient tracking devices (RFID, barcode)
Preparing in Advance

- Registration naming convention
- Role-based assignment sheets
- Rapid triage procedure
- Mechanism-specific order sets
- Mechanism-specific documentation templates
- Deployment plan for care teams
- Deployment of information managers
Integrate Information Systems into Disaster Drills & Training
# Longer Term Opportunities

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<th>Proposed Longer-term Strategies</th>
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<td>Limited Situational Awareness – Patient Tracking</td>
<td>• Use RFID technology for hospital patient location tracking</td>
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<td>Difficult to distinguish unidentified patient names</td>
<td>• National recommendations for best practices for unidentified patient naming conventions</td>
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| Lack of real-time documentations of orders, assessments, and procedures | • Disaster mode: dedicated, simpler MCI information system, electronic, paper-based, or hybrid paper/electronic  
  • Improve usability of existing EHR systems (i.e., dedicated disaster radiology order entry screen) |
Conclusions

• Information systems are critical for mass casualty incidents
• Opportunities to improve information systems to better support disasters
  – Review your unidentified naming strategy
• Drill with information systems
• Make everyday enhancements to your system that will improve usability and efficiency for disaster
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Questions?

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