An Urban Radiology Department’s Approach to Mass Casualty Incidents (MCIs)

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Background

- Mass Casualty Incidents (MCIs) are critical high-pressure, high-resource events.
- Can easily overwhelm an unprepared hospital center through sheer volume and wide range of pathology sometimes seldomly seen (gunshot wounds, blast lung injuries, etc.)
- It is important to clearly delineate inter- and intra-departmental roles and lines of communication.

Photo Credits: United States Justice Department
Purpose

• This single center study aimed to identify shortcomings in their MCI response.

• Various process improvements were then implemented, such as how to rapidly account for the safety of its house staff.
Methods

• Several MCI simulations involving Radiology, Emergency Medicine, Perioperative Services, Trauma Service, Critical Care, and the Incident Management Team.
Methods

Figure 1. Exercise Scenario Summary

On Wednesday, November 15th, just before 9:00am, two men enter the Gerald W. Lynch Theatre at John Jay College where a foreign diplomat is speaking on the topic of counterterrorism. The two men take out semiautomatic rifles and fire into the auditorium full of 150 students, faculty, guests, and law enforcement.

Immediately following the shooting, social media and traditional media sources pick up word of the mass shooting and NYPD response. At roughly 9:10am, the Red Phone rings with a FDNY notifying the ED Charge Nurse that there is a Level C MCI. Moments later, multiple casualties present to the Emergency Department.

Objectives

1. The hospital will utilize hospital-wide interdepartmental notification systems to activate the hospital emergency operations plan in response to a declared mass casualty incident (Level C) near the hospital immediately in accordance with escalation policies and procedures.

2. Departments/teams essential to responding to a mass casualty incident will communicate information regarding the event to both on-duty and on-call staff in order to alert, huddle, work.

3. Clinical teams will demonstrate their ability to appropriately triage patients and coordinate the immediate post-ED disposition those patients in a rapid manner.

4. Departments will establish and maintain accurate patient tracking of all mock disaster patients from arrival at point of entry until final disposition.

Activities among the following departments were the primary focus of this exercise: Emergency Department, Radiology, Critical Care, and the Operating Room (OR). Representatives from these departments participated in the exercise and followed emergency response procedures outlined in their department’s emergency plans.
Results

• There were several inherent barriers unique to our institution: multi-site coverage, the geographically separated ER Radiology Resident from the location of the MCI.

• These institutional barriers could potentially lead to breakdowns in communication with the ED.
Results

- Two components were created:
  - (1) an MCI flowsheet
  - (2) a “recall roster.”
- A third concept was discussed but not implemented, the Radiology Communication Liaison.
MCI Flowsheet

- A user-friendly MCI Flowsheet was designed to allow for rapid communication between Departments.
ED Radiology Resident Flow Chart

1. After receiving page, contact appropriate ED, figure out Mass Casualty Incident (MCI). (Where? How many people? What type of injuries? Etc.) Give ED Team your immediate extension at your work station.
2. Contact Radiology Leadership.
3. Contact ED Radiology Attending (search on QGenda for who is on)
4. Notify IR Team at appropriate location. Pagers only after 4 PM.
5. Notify Lead Tech at appropriate site. Pager only at MSSL.
6. Notify Chief Residents
7. Get back to dictating as fast as possible, wait for help to arrive.
   Communicate acute findings to ED Staff.

MCI Team Member Responsibilities

1. Radiology Leadership will serve as a liaison between Radiology and Emergency Department. Continually assess the situation.
2. Lead Tech will assess future predicted scanner usage, and current tech availability. Call in additional techs for support if necessary. Predict future scan usage for the next 0-2, 2-12 and 12-24 hours. Alert staff to hold all non-emergent imaging for MCI cases. Ensure adequate supplies.
3. Chief Residents, assist ED Radiology Resident with unforeseen difficulties (for example, ED Attending/Lead Tech hard to get in contact with.) Gauge situation and call in additional radiology residents for support if necessary. May serve as liaison between Radiology and Emergency Department for critical situations.
# Radiology Mass Casualty Event Procedure

**For Use By Radiology Unit Leader**

| **Objective:** | To efficiently image and diagnose a rapid influx of trauma patients during a mass casualty event |
| **Instructions:** | Follow checklist, initial and indicate time when each item is complete |

<table>
<thead>
<tr>
<th><strong>Task</strong></th>
<th><strong>Initial</strong></th>
<th><strong>Time</strong></th>
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<tbody>
<tr>
<td>Refer to Department Emergency Operations Plan / Radiology Mass Casualty Procedure</td>
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<tr>
<td>Confirm Radiology Unit Leader and Deputy Unit Leader assignments:</td>
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<tr>
<td>• Unit Leader <em>(Primary):</em></td>
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<td>• <em>(Alternate):</em></td>
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<td>• Deputy Radiology Unit Leader:</td>
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<td>Activate call-in tree; recall staff as needed</td>
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<tr>
<td>• ER Resident notifies ER Attending Radiologist, Chief Resident(s), IR housestaff, and Lead Tech</td>
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<tr>
<td>• ER Attending radiologist will notify attending leadership</td>
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<tr>
<td>• Chief Resident(s) will notify additional resident physician staff</td>
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<tr>
<td>• Lead Tech will notify his or her supervisor</td>
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<td>ED Radiology Resident to communicate with a member of Clinical Leadership Group (CLG)</td>
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<td>• Radiology resident covering the emergency department will communicate acute radiological findings with the Deputy Unit Leader in the ED.</td>
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<tr>
<td>• Maintain open communications between the CLG and Radiology Unit Leader.</td>
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<td>• Exchange contact information – Radiology to be available at extension:</td>
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<tr>
<td>Tech Supervisor assign staff to X Ray and CT Scanner rooms and determine current/future Radiology Department status and capacity:</td>
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<tr>
<td>• Determine Radiology Department staffing and capacity over the next 0-2, 2-12, and 12-24 hours</td>
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<tr>
<td>Lead Tech alerts staff at the front desks and technologists to pause cases, if safe, and to hold all non-emergent imaging for inpatients and outpatients:</td>
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<tr>
<td>• Temporarily hold non-emergent imaging; <em>do not</em> resume non-emergent imaging until the Emergency Department confirms they will not receive trauma cases from the event</td>
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<tr>
<td>• If situation warrants, direct radiology technologists to finish scanning these patients as soon as possible and prepare to receive trauma cases</td>
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<tr>
<td>Lead Tech ensures adequate supplies:</td>
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<tr>
<td>• Coordinate with diagnostic and interventional radiology techs and nurses, central sterile/materials management, and pharmacy personnel to ensure adequate supplies of fluids, contrast material, disposables, and other supplies</td>
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<td>Report Radiology status patients to Incident Commander / Hospital Leadership Command Center #</td>
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<td>Review your UNIT LEADER Job Action Sheet</td>
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**Ongoing Assessment and Response Management:**

- Close-the-loop on any open / assigned items
- Huddle with Radiology Staff as needed to maintain effective communication and situational awareness
Recall Roster: why have one?

Mass Casualty Incidents can come in many unexpected forms and even affect our own.

In 2016, a high-rise apartment which housed resident physicians in our institution caught on fire, prompting evacuation. Many were trapped within their domiciles.

Dozens suffered injuries (inhalational, burns, etc.) Accounting for house staff was disorganized given the chaos.
Recall Roster

• If the MCIs of the past (Las Vegas, San Bernardino, Orlando, Boston, Sandy Hook, Aurora, Columbine, Blacksburg) have taught us anything, it is that they can occur at any time, at any place, with no warning.

• The recall roster is designed with that understanding in mind, to rapidly account for the well-being of a program’s house staff.

• It is our program’s recommendation that every program have a recall roster.
***sample recall roster does not reflect our program’s true size.

Upon MCI alert, the Program Director can “activate” a recall by alerting the Chief Residents.

Chief Residents then are responsible for alerting the house staff they are responsible for.

There is no lateral direction of communication (e.g.: an R3 should not be contacting an R1).

This system is widely used in the military for its effortless, rapid accountability of personnel, while limiting misinformation and redundancy, due to its inherent unidirectional flow of communication.
For Consideration: Radiology Communication Liaison

- The Emergency Department developed the concept of a Radiology Communication Liaison.

- The RCI, a senior Radiology Resident, was to be co-located in the Emergency Department to theoretically communicate acute findings as rapidly as possible.

- In practice, the added benefit of putting the radiology resident in the ED was negligible. ED clinicians often bypassed the RCI resident during these exercises, whose role in the ED was not clearly defined.

- For Radiology workflow, acute findings were found to be communicated much more rapidly (and clearly) if the resident was not removed from their workstation.
Conclusions

• Well-designed full scale MCI exercises are critical for the preparedness of an institution’s medical response, emphasizing the importance of defined roles and effective communication.

• Utilizing an MCI flowsheet should help overcome the initial communication barriers between the different departments.

• Additionally, of equal importance and often unmentioned is how we care for our own during these catastrophic events. The ‘recall roster’ was produced with our large residency program in mind to effortlessly account for the safety of all house staff as rapidly as possible.