Disaster Drills: Planning, Conducting, Evaluating and Reporting - The Denver Health Experience

Third National Emergency Management Summit
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Denver Health – Who are we?

- 500 bed full-service safety-net hospital
- 400,000 outpatient visits / year
- Level 1 Trauma Center
- Rocky Mountain Poison Center
- Denver Prehospital 911 EMS (third service)
- Handles all public mass gatherings/disasters in the City of Denver
Some of the Fun Stuff

- Continental 1713 DC-9 crash
- World Youth Day (week)
  - Visit by the Pope and President
- Summit of Eight
- TopOff 2000
- Super Bowl and Stanley Cup “celebrations”
- Columbine High School shootings
- Democratic National Convention
Some Disaster Drill Axioms

- A fully successful drill/exercise is a failure
  - You didn’t learn anything
  - You didn’t stress the system
  - Administrators, local, state and federal governments have a hard time with this concept
- A total failure drill/exercise is a failure
  - Demoralizing: “What’s the use?”
Some Disaster Drill Axioms

- Physicians are the toughest group to engage
  - Not “paid to train”
  - Fail to appreciate the need for training
- Volunteer “victims” are becoming harder to find
- Joint Commission has actually made it easier to hold exercises
Some Disaster Drill Axioms

- Start small, grow big
- Start with Hospital Incident Command System (HICS) (and NIMS) training
- Do a hazard vulnerability analysis (HVA)
- An institutional advocate is mandatory
- Getting buy-in from all players is a challenge
Some Disaster Drill Axioms

- Don’t just use the upper level players that know how it should be done – they will be in bed when the ball drops for real
  - Use real workers
- Make it fun: it is a learning experience
The Continuum of Exercises

- Discussion-Based
  - Seminars, Workshops, Tabletops, Games

- Operations-Based
  - Drills, Functional Exercises, Full Scale Exercises

- Notice vs No-Notice vs “Some”-Notice
One Approach: Step-wise Progression

1. Management and Staff HICS Training
2. Tabletop exercises
3. Section Specific Drills:
   (Operations, Planning, Logistics, Finance, Command)
4. Functional Exercises
5. Hospital Wide Exercises
6. Full Scale Community Exercises
When anyone asks me how I can best describe my experience in nearly 40 years at sea, I say, ‘Uneventful’.

…I have seen but one vessel in distress in all my years at sea…I never saw a wreck and have never been wrecked.

…in all my experience I have never been in any accident of any sort worth speaking about. Nor was I ever in any predicament that threatened to end in disaster of any sort.

What we want to avoid:
…there’s always a first time!
The Captain, his crew/passengers and the Titanic itself were all ill-prepared for an emergency:

- Poor communication (Delayed SOS transmission)
- Inadequate training of staff and passengers
- Inadequate number of lifeboats
- It won’t happen to me, us, here
“Emergency Response”

“Uncomfortable officials, in unfamiliar surroundings, playing uncomfortable roles, making unpopular decisions, with inadequate information, with too little time.”
CHAOS

CHIEF
HAS
ARRIVED
ON
SCENE
Where do you start in terms of planning and evaluation?

➢ Tool for Evaluating Core Elements of Hospital Disaster Drills

Hospital Incident Command Guidebook

- Outline the important tenets of
  - Response planning
  - Incident command
  - Effective response

www.emsa.ca.gov/HICS/files
The Issues – Pre-Drill

- Who is going to play?
- What are we going to stress?
  - Overall objectives
  - Specific objectives
- What is the scenario?
- What is the duration?
# Pre-Drill Module

Hospital Disaster Drill Evaluation

**Pre-drill Module**

*Note: Circle or check (✔) as indicated. NA=Not applicable*

## 1. Background Information

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.a</td>
<td>Name of person completing module: ________________________________</td>
</tr>
<tr>
<td></td>
<td>Title: ________________________________</td>
</tr>
<tr>
<td></td>
<td>Office phone: ________________________________</td>
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<tr>
<td></td>
<td>Hospital: ________________________________</td>
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<td></td>
<td>Cell phone: ________________________________</td>
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<tr>
<td></td>
<td>E-mail: ________________________________</td>
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<td></td>
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<td></td>
<td>FAX: ________________________________</td>
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<td></td>
<td>City and state: ________________________________</td>
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<td></td>
<td>Pager: ________________________________</td>
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<tr>
<td></td>
<td>Best method of contact during the drill. (Check one.)</td>
</tr>
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<td></td>
<td>○ Cell phone</td>
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## 1.b What will the disaster scenario include? (Check all that apply.)

- [ ] Biological agent
- [ ] Chemical agent
- [ ] Fire
- [ ] Incendiary device/explosive
- [ ] Natural disaster (e.g., earthquake)
- [ ] Radiological agent
- [ ] Structural collapse
- [ ] Transportation accident
Pre-Drill Module/Checklist

- Level and Scope of Drill
- Drill Activity
  - Notification
  - Expected participants
  - Expected level of activity
  - Outside participation
  - Incident Command
- Communications
- Evaluation
The Issues – Pre-Drill

- Development of objectives
- Develop evaluation guides (3)
- Develop detailed timeline and exercise injects
- Develop 20 unique patient presentations
- Obtain necessary controllers/evaluators/victims
- Meetings:
  - Hospital participants
  - Controllers/evaluators day before exercise
The Exercise

- **Exercise Name:** Metropolitan Denver Hospital Exercise 2008
- **Exercise Date:** Part A - June 10, 2008 and Part B - July 11, 2008
- **Duration:** Approximately 3 hour on each date
- **Type of Exercise:** Drill
- **Sponsors:** Colorado BNICE Training Center, Denver Metropolitan Medical Response System and Denver Office of Emergency Management
- **Scenario:** Radiological Attack – Radiological Dispersal Device (adapted from National Planning Scenario 11)
Scenario Synopsis

- Radiation dispersal device – Cesium-137
  - Exploded at the Denver Pepsi Center
  - 180 fatalities on scene with 270 injured
- Secondary device exploded at scene about 30 minutes into event; patients reported seizing at scene
Who Plays?

- Individual hospitals
- Denver Office of Emergency Management
- Denver Metropolitan Medical Response Team
Number of Exercise Participants:

- **Part A – June 10, 2008**
  - Hospitals  8
  - Victim Volunteers  153
  - Controllers  9
  - Evaluators  24

- **Part B – July 11, 2008**
  - Hospitals  9
  - Victim Volunteers  140
  - Controllers  9
  - Evaluators  27
General Exercise Objectives

- Utilize established protocols to appropriately assess, triage and treat a surge of patients presenting with a variety of conditions.
- Respond to the incident using procedures consistent with their emergency operations plan ensuring the safety of hospital personnel and the general public.
- Utilize established protocols to discuss the steps that would be taken to increase surge capacity.
- (These were related to participating hospitals)
Specific Expectations of Hospital Participation

- Activate their hospital command center and hospital emergency operations plan
- Properly triage and treat victims/patients
- Appropriately use personal protective equipment and decontamination equipment
- Provide written surge capacity plans
- Walk through/discuss surge capacity plans with evaluator
- Have appropriate participation from administration, clinical staff (including physicians), non-clinical staff, and security and safety personnel
- Provide a list of personnel that participated in the exercise
  - List to include: name, title/position, and functional role related to exercise
- Participate in review after exercise at hospital location
  - Provide location/room for exercise review
- Participate in after exercise wrap-up
- Provide staging area for controller and victim volunteers
Specific Areas of Evaluation (Summary)

1. WMD/Hazardous Materials Response and Decon at Hospital
   1. Patient Decon
   2. Personal Protective Equipment
   3. Triage and Treatment of Patients
   4. CHEMPACK Activation and Request
Specific Areas of Evaluation (Summary)

2. Onsite Incident Management: Hospital Command Center (HCC)
   1. HCC is activated
   2. HICS structure is used
   3. HICS forms are used as needed
   4. Job Action Sheets are distributed
   5. Departments are notified that HCC is active
   6. Departments communicate with HCC
   7. HCC communicates with Denver EOC throughout event
Specific Areas of Evaluation

3. Medical Surge

1. Plan in place to identify pts for early discharge to handle surge
   1. Floor patients to home or ACF
   2. ICU patients to floor
   3. Plan for patient transport to ACF

2. Plan in place to open alternate care facility to handle surge
   1. Staffing plan
   2. Supply plan
Exercise Evaluation Guide: WMD/Hazardous Materials Response and Decontamination at Hospital Location

**Capability Description:** Weapons of Mass Destruction (WMD)/Hazardous Materials Response and Decontamination is the capability to assess and manage the consequences of a hazardous material release, either accidental or part of a terrorist attack. The capability includes proper use of personal protective equipment, decontamination equipment and proper assessment, triage and treatment of patients.

**Capability Outcomes:** Hazardous material release is rapidly identified and mitigated; victims exposed are rescued, decontaminated, triaged, and treated. Procedures are in place to prevent cross contamination and to protect hospital personnel and other hospital patrons.

<table>
<thead>
<tr>
<th>Name of Exercise: Metropolitan Denver Hospital Exercise 2008</th>
<th>Date: June 10, 2008</th>
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<tbody>
<tr>
<td>Location:</td>
<td>Evaluator Phone Number:</td>
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<td>Evaluator:</td>
<td>Evaluator Email:</td>
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**Tasks/Observations**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time</th>
<th>Task Completed</th>
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</thead>
<tbody>
<tr>
<td>1. Patient Decontamination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Using Decon tents or fixed decon facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Decontamination tents are properly set up</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii. Decontamination tents are in an appropriate and safe location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Adequate personnel are available for decontamination of patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Patients are given clear decontamination instructions</td>
<td></td>
<td></td>
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</table>
### Timeline & Injects

**Metropolitan Denver Hospital Exercise 2008**

<table>
<thead>
<tr>
<th>Seq. #</th>
<th>Inject Type</th>
<th>Delivery Method</th>
<th>Simulated Originate</th>
<th>Recipient Name</th>
<th>Inject Name</th>
<th>Inject Status</th>
<th>Time of Inject</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Expected Action</td>
<td>LTN, EM Systems</td>
<td>Green Cell</td>
<td>All Hospitals</td>
<td>Initial incident explosion information</td>
<td></td>
<td>0900</td>
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<td>2</td>
<td>Expected Action</td>
<td>LTN, EM Systems</td>
<td>Green Cell</td>
<td>All Hospitals</td>
<td>Fire Department is reporting that radiation has been detected at the scene</td>
<td></td>
<td>0903</td>
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<tr>
<td>3</td>
<td>Expected Action</td>
<td>LTN, EM Systems</td>
<td>Green Cell</td>
<td>All Hospitals</td>
<td>Scene Assessment – victims will require decontamination</td>
<td></td>
<td>0910</td>
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<tr>
<td>4</td>
<td>Event</td>
<td>Other/Victim Volunteers</td>
<td>Green Cell</td>
<td>Controllers at Hospitals</td>
<td>Patients begin entering the hospital locations - Patients 1-3</td>
<td></td>
<td>0915</td>
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<tr>
<td>5</td>
<td>Expected Action</td>
<td>Casite Controller</td>
<td>Green Cell</td>
<td>All Hospitals (not TCH)</td>
<td>Hospital fixed radiation detector is activated</td>
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<td>0915</td>
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<td>6</td>
<td>Event</td>
<td>Other/Victim Volunteers</td>
<td>Green Cell</td>
<td>Controllers at Hospitals</td>
<td>Patients 4-6 enter hospital</td>
<td></td>
<td>0917</td>
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<td>7</td>
<td>Expected Action</td>
<td>LTN, EM Systems</td>
<td>Green Cell</td>
<td>All Hospital</td>
<td>Casualty information: 180 fatalities; 270 injuries; 20,000 detectable contaminations. Victims exceed capacity</td>
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<td>8</td>
<td>Event</td>
<td>Other/Victim Volunteers</td>
<td>Green Cell</td>
<td>Controllers at Hospitals</td>
<td>Patients 7-8 enter hospital</td>
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<td>0920</td>
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<td>9</td>
<td>Expected Action</td>
<td>LTN, EM Systems</td>
<td>Green Cell</td>
<td>All Hospitals</td>
<td>Secondary event-another explosion report of people seizing at the scene</td>
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<td>0925</td>
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<td>10</td>
<td>Event</td>
<td>Other/Victim Volunteers</td>
<td>Green Cell</td>
<td>Controllers at Hospitals</td>
<td>Patients 9-11 enter hospital</td>
<td></td>
<td>0925</td>
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<td>11</td>
<td>Event</td>
<td>Other/Victim Volunteers</td>
<td>Green Cell</td>
<td>Controllers at Hospitals</td>
<td>Patients 12-14 enter hospital</td>
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<td>0927</td>
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<td>12</td>
<td>Event</td>
<td>LTN, EM Systems</td>
<td>Green Cell</td>
<td>All Hospitals</td>
<td>Radiation identified as beta and gamma</td>
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<td>13</td>
<td>Event</td>
<td>Other/Victim Volunteers</td>
<td>Green Cell</td>
<td>Controllers at Hospitals</td>
<td>Patients 15-18 enter hospital</td>
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<td>0930</td>
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<tr>
<td>14</td>
<td>Event</td>
<td>LTN, EM Systems</td>
<td>Green Cell</td>
<td>All Hospitals</td>
<td>National News Agencies are beginning to report this as an intentional act</td>
<td></td>
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Patient Presentations

*Patient Names/Ages/Sex and complaints are fictional and were created for use in this exercise.*

**Transport:** EMS
**Name:** Rankin, Travis
**Age:** 2
**DOB:** 06/1/2006
**Sex:** Male
**HT:** 2'3''
**WT:** 12 Kilos

**Pre Hospital Vital signs:** B/P: pale, warm, and dry HR: 160 RR: 30 SP02: 95% Room air

**CC/Findings:** Right arm deformity with cyanosis to right hand.

**Pre Hospital Treatment:** Attempted to reduce per pre hospital protocol times one unsuccessfully, ice bag on arm.

**ED Arrival Vitals:** B/P: pale, warm, and dry HR: 155 RR: 36 Temp: 99.0 (37.2) SP02: 100% Room air

**Triage:** Uncontrolled crying, obvious deformity to right forearm with cyanosis to right hand

**Medical HX:** None
**Surgical HX:** None
**Home Medications:** None
**Allergies:** None
**Last meal:** 0600 Breakfast
The Exercise
Post Exercise

- After Exercise Review held immediately post exercise at each institution facilitated by a site controller
- An Exercise Wrap-up meeting was held the day following each exercise for members of each participating hospital, controllers and evaluators
- After Action Report developed and circulated to all participants
What went well:

- Incident recognition and the need for decontamination
- Hospitals had the need equipment available
- Successfully staff and operate decontamination facilities
- Decontamination tents were set up properly
- Employees were knowledgeable on their roles
- Incident Commander identified
- HICS structure was used
- EMSsystems was effectively used by emergency departments and HCC
- HCC were activated in an appropriate timeframe
- Responded timely to HAvBED requests via EMSsystems
Things that could have gone better:

- Faster set up of decontamination equipment
- All personnel responding need to be in appropriate PPE
- Quicker donning of PPE
- Better communication between HCC and departments
- Equipment need to respond to a radiological event
- Treatment and triage of radiological trauma patients
- Decontamination equipment did not always function properly
- With the secondary explosion, possible chemical event was not identified
- Need to have written surge capacity plans easily accessible
Corrective Action Suggestions

- Response teams need consistent training on decontamination equipment
- Hospital staff need consistent and proper training on appropriate PPE and donning and doffing procedures
- Scheduled equipment checks to make sure decontamination equipment is functioning correctly
- Review of treatment and triage standards for contaminated patients
- Training on HICS, Command Staff positions, and HICS forms
- Verify that a copy of the hospital’s emergency operations plan is available in the HCC
- Training on CHEMPACK activation and request process
- Conduct a decontamination drill once every six months
“A drill with no problems is a wasted learning experience”