Lesson Six

The DISASTER Paradigm™
Lesson Learning Objectives

Given a disaster or public health emergency scenario:

• Identify early warning systems, indicators, and clues that may signal onset
• Given list of terms from incident management lexicon, match each to its definition
• Describe important health, safety, and security risks to be considered
• Describe personal, institutional, and community protective measures to prevent and control spread of disease

Continued
Lesson Learning Objectives

*Given a disaster or public health emergency scenario:*

- Discuss the purpose and rationale for personal protective equipment
- Discuss the purpose and rationale for victim decontamination
- Define *surge capacity* in the context of health system response
- Given a mass casualty scenario, discuss the purpose of triage

Continued
Lesson Learning Objectives

Given a disaster or public health emergency scenario:

• Identify basic lifesaving and life support measures to minimize morbidity and mortality

• Describe situations and circumstances that may hinder safe evacuation of affected populations

• Identify strategies to ensure continuity of supplies and services to meet medical or mental health needs

• Describe the potential short- and long-term impact of event on recovery of local health system
The DISASTER Paradigm

Detection
Incident management
Safety and Security
Assess hazards
Support
Triage and Treatment
Evacuation
Recovery
The DISASTER Paradigm

Mnemonic device for all-hazards disaster response

• Uniform framework to address disaster recognition, response, and recovery

• Organizational tool for responders to assess individual and community needs and utilize available resources

• Mechanism for promoting consistency of communications among emergency responders and response agencies
Goals of Detection Process

• Determine existence of emergency situation that may overwhelm immediately available resources
• Protect personal safety and prevent harm to others
• Determine possible cause of the situation
• Alert authorities to plan for or initiate rapid and coordinated response
Priority: Personal Safety

Does anything appear out of the ordinary?

What possible hazards are present?

What resources are available to help?

What information can witnesses provide?

FEMA Images
Biological Emergency Clues

**Illness:**

- Out of range  
  *(Spike in influenza-like illness)*
- Out of context
- Out of sequence
- Out of season
- Out of place

CDC Image
Chemical Emergency Clues

- Noxious or foul odor
- Rapid symptom onset
- Patients reporting common signs and symptoms
- Concentrations of dead, dying, or sick people
- Unexplained illness/death in young or healthy people
- Unexplained death of plants, fish, or animals
- Chemical dissemination devices present at the scene
- Low-lying clouds or vapors
Hundreds of people from the same location present to the local ED over a few minutes complaining of common signs and symptoms (eg, shortness of breath, skin and eye burning). This is most likely a result of:

1. Biological emergency
2. Mass hysteria
3. Chemical emergency
4. All of the above
National Incident Management System

• Standardizes command and control structure nationwide
• Provides standards for training, equipment, and other resources
• Clearly defines roles and responsibilities during disaster management

NIMS
Incident Command Systems (ICS)

- Unity of command
- Orderly line of authority
- Span of control
- Standardized and scalable response
- Clarity of message
Tour of State EOC during 2011 Missouri River Flood, SDPB
Emergency Operations Center (EOC):

Central command and control location responsible for carrying out principles of emergency management at strategic level in emergency situation.
Safety Priorities

Protect Self

Protect Others

Protect Community
Safety and Security: DO

- Do protect yourself and others from harm
- Do communicate potential hazards to others
- Do enforce restricted access as directed
- Do proceed as though scene is contaminated
- Do remain vigilant for secondary hazards
Safety and Security: DON’T

- Don’t show up as a spontaneous volunteer
- Don’t enter scene without protection
- Don’t become another casualty
- Don’t contribute to traffic problems
- Don’t disturb the scene
<table>
<thead>
<tr>
<th>Possible Hazards at Scene</th>
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<tbody>
<tr>
<td>Animals and insects</td>
<td>Environmental exposure</td>
<td>Hazardous material release</td>
</tr>
<tr>
<td>Blood/body fluid exposure</td>
<td>Equipment-related injuries</td>
<td>Motor vehicle crashes</td>
</tr>
<tr>
<td>Communication disruption</td>
<td>Explosions</td>
<td>Ruptured gas lines</td>
</tr>
<tr>
<td>Contamination (air, water)</td>
<td>Fire</td>
<td>Secondary explosive devices</td>
</tr>
<tr>
<td>Debris</td>
<td>Flooding</td>
<td>Smoke and toxic gases</td>
</tr>
<tr>
<td>Downed power lines</td>
<td>Gunman/snipers</td>
<td>Structural collapse</td>
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</tbody>
</table>
Risk Reduction Measures:
Personal Protective Equipment (PPE)

Purpose: Reduce potential exposure to chemical, biological, radiological, and infectious disease threats
Risk Reduction Measures: Decontamination

Dry decontamination removal of all clothing, shoes, socks, jewelry, undergarments, and contact lenses

Wet decontamination dry decontamination, plus high-volume wash with soap and water, scrubbing of external body surfaces, and use of neutralizing/deactivating substances
Support: Human Resources

- Health professionals
- Firefighters
- Law enforcement
- Bomb squad
- Heavy rescue
- HAZMAT teams
- Construction workers
- Equipment operators
- Warehouse personnel
- Administrators
- Photographers
- Housekeeping staff
- Truck drivers

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**Definition:** Sorting of patients by seriousness of condition and likelihood of survival

**Goal:** Help as many injured persons as possible with resources available
Mass Casualty Triage

• Disaster triage involves categorization of casualties with severe injuries in need of medical attention

• Needs exceed available resources thus all casualties may not receive full medical care

• Field triage often performed by local first responders

• Knowledge of medical consequences of injuries is critical and particularly important for children

• All affected persons, injured or otherwise, cannot be attended to at once
SALT Triage

- Simple, effective tool that is easy to remember
- Allows response personnel to sort large groups of casualties
- Aids in determination of lifesaving interventions to administer

<table>
<thead>
<tr>
<th>S</th>
<th>Sort</th>
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<tbody>
<tr>
<td>A</td>
<td>Assess</td>
</tr>
<tr>
<td>L</td>
<td>Lifesaving interventions</td>
</tr>
<tr>
<td>T</td>
<td>Treatment/transport</td>
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</tbody>
</table>
SALT Triage: Initial Step

Step One – Sort:
Global Sorting

Step Two – Assess:
Individual Assessment

- Walk
  Assess 1st

- Wave/Purposeful Movement
  Assess 2nd

- Still/Obvious Life Threat
  Assess 3rd
SALT Mass Casualty Triage

Step One – Sort: Global Sorting

- Walk
  - Assess 1st

Wave/Purposeful Movement
- Assess 2nd

Still/Obvious Life Threat
- Assess 3rd

Step Two – Assess: Individual Assessment

LSI*
- Control major hemorrhage
- Open airway (if child, consider 2 rescue breaths)
- Chest decompression
- Auto injector antidotes

Breathing
- Yes
  - Obeys commands or makes purposeful movement?
  - Has peripheral pulse?
  - Not in respiratory distress?
  - Major hemorrhage in control?
- No
  - Likely to survive given current resources
  - Expectant

Minor injuries only?
- Yes
- Delayed
- Immediate
- Dead
- Expected

*LSI: Life Saving Interventions

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<table>
<thead>
<tr>
<th>Triage Categories</th>
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<tbody>
<tr>
<td><strong>I</strong> Immediate</td>
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<tr>
<td><strong>D</strong> Delayed</td>
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<tr>
<td><strong>M</strong> Minimal</td>
</tr>
<tr>
<td><strong>E</strong> Expectant</td>
</tr>
<tr>
<td><strong>D</strong> Dead</td>
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Evacuation

Goal: timely and orderly removal of persons from disaster scene or affected region, and may include:

- Injured
- Uninjured without transportation
- Rescue personnel
- Families of casualties
- Patients in hospitals
- Community at large
Pre-Event Evacuation

- Is evacuation the best course, or should shelter-in-place be considered?
- Where will populations be evacuated to?
- How will they get there?
- Who will manage and communicate updates while temporarily housed?
- What about family pets and other animals?
Post-Event Evacuation: Uninjured Individuals

- Top priority is evacuation to safer environment
- Involves organizational and logistical challenges
- Many uninjured individuals will need assistance
- Evacuation is coordinated effort
Post-Event Evacuation:
Patients and Victims

• Options: treat at scene or transport
• Distribute casualties among local facilities to reduce burden
• Send patients with pediatric injuries or burns to specialty hospitals
• Distribute patients with minor injuries among local centers
• Determine how to track patients for family unification
## Evacuation: Challenges

<table>
<thead>
<tr>
<th>Facilities</th>
<th>Individual</th>
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<tbody>
<tr>
<td>• Long-term care facilities</td>
<td>• Ventilator-dependent</td>
</tr>
<tr>
<td>• Hospitals</td>
<td>• Oxygen-dependent</td>
</tr>
<tr>
<td>• ICU patients</td>
<td>• Mobility impaired</td>
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<tr>
<td>• Assisted living facilities</td>
<td>• Visual &amp; hearing impaired</td>
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Recovery

• **Goal:** Restore community to “normal” level of functioning and minimize impact of event

• Effective preparation can reduce stressors and facilitate recovery process

• Beginning when event actually occurs, recovery is longest phase of disaster

• Requires long-term commitment to community

• Physical, economic, and community recovery may take months or even years
Recovery: Immediate Period

Recovery phase requires coordinated effort from multiple agencies (government officials, EMS, area hospitals)

Considerations:

– Lack of basic needs (food, water, shelter, or clothing)
– Newly homeless or resource-impaired
– Disruption in utility, computer, telecommunications systems
Lesson Summary

• Detection requires awareness of environment and recognition of unusual circumstances

• Incident management is facilitated through the incorporation of NIMS and ICS principles

• To ensure scene safety and security, everyone should be vigilant of immediate surroundings

• Assessment of real and potential hazards related to evolving scene must be done continually

Continued
Lesson Summary

• Receiving support from multiple agencies and organizations is critical for affected communities

• Disaster triage and treatment is about rendering lifesaving care

• With pre-planning, resources to facilitate evacuation can be put in reserve and called into action

• Recovery is a long-term process and complete when community returns to normal, pre-event functioning
Course Post-Assessment and Evaluation

NASA's Goddard Space Flight Center's Scientific Visualization Studio