Disaster Planning: Crisis Standards of Care

Mark B. Shah, MD

Attending Physician, Utah Emergency Physicians; Adjunct Clinical Faculty, Division of Emergency Medicine, University of Utah; Medical Director for Emergency Management, Urban Central Region; Co-Medical Director Intermountain Center for Disaster Preparedness

Salt Lake City, Utah

Objectives:

• Outline the current development of crisis standards of care
• Summarize the benefits and limitations of crisis standards
• Discuss the potential impacts of crisis standards on providers and patients
Tips for Surviving Your Worst Shift Ever

Mark Shah, MD
Utah Emergency Physicians
Emergency Management, IHC UCR
Utah Disaster Medical Assistance Team
Intermountain Center for Disaster Preparedness
Objectives

Outline the current development of Crisis Standards of Care

Summarize the benefits and limitations of crisis standards

Discuss the potential impacts of crisis standards on providers and patients
Crisis Standards of Care

A substantial change in usual healthcare operations and the level of care it is possible to deliver, which is made necessary by a pervasive or catastrophic disaster.

Deviates from a standard that has been established by peers and often codified into laws and regulations.

Institute of Medicine - Guidance for Establishing Crisis Standards of Care for Use in Disaster Situations, 2009
# Crisis Standards of Care

## Incident demand/resource imbalance increases

Risk of morbidity/mortality to patient increases

## Recovery

<table>
<thead>
<tr>
<th>Conventional</th>
<th>Contingency</th>
<th>Crisis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Space</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usual patient care space fully utilized</td>
<td>Patient care areas re-purposed (PACU, monitored units for ICU-level care)</td>
<td>Facility damaged/unsafe or non-patient care areas (classrooms, etc.) used for patient care</td>
</tr>
<tr>
<td><strong>Staff</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usual staff called in and utilized</td>
<td>Staff extension (brief deferrals of non-emergent service, supervision of broader group of patients, change in responsibilities, documentation, etc.)</td>
<td>Trained staff unavailable or unable to adequately care for volume of patients even with extension techniques</td>
</tr>
<tr>
<td><strong>Supplies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cached and usual supplies used</td>
<td>Conservation, adaptation, and substitution of supplies with occasional re-use of select supplies</td>
<td>Critical supplies lacking, possible re-allocation of life-sustaining resources</td>
</tr>
<tr>
<td><strong>Standard of care</strong></td>
<td>Functionally equivalent care</td>
<td>Crisis standards of care^a</td>
</tr>
</tbody>
</table>

### Normal operating conditions

- Indicator: potential for crisis standards^b

### Extreme operating conditions

- Trigger: crisis standards of care^c

---

^a Crisis standards of care: guidelines that are used to prioritize care during a crisis when resources are limited.

^b Indicators are signs that suggest a potential crisis is imminent.

^c Triggers are events that initiate the implementation of crisis standards of care.
Disaster Response: Dispensing Care Differently

Normal – unlimited resources for the greatest good for each individual patient

Disaster

Disaster – allocation of limited resources for the good of the greatest number of patients
New Orleans 2005
25% chance of a large earthquake somewhere along the Wasatch Front in the next 50 years

80% of Utah’s population lives within 15 miles of the Wasatch fault
An Earthquake would be devastating

Losses estimated for a magnitude 7 earthquake on each of the central segments of the Wasatch fault.

<table>
<thead>
<tr>
<th>Wasatch Fault Segment</th>
<th>Building Losses ($ billions)</th>
<th>Displaced households</th>
<th>Life-threatening injuries and fatalities</th>
<th>Building Losses ($ billions)</th>
<th>Displaced households</th>
<th>Life-threatening injuries and fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2005</td>
<td>2055</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brigham City</td>
<td>3</td>
<td>14,000</td>
<td>500</td>
<td>4.5</td>
<td>21,000</td>
<td>750</td>
</tr>
<tr>
<td>Weber</td>
<td>16</td>
<td>57,000</td>
<td>3,000</td>
<td>24</td>
<td>85,500</td>
<td>4,500</td>
</tr>
<tr>
<td>Salt Lake City</td>
<td>42</td>
<td>150,000</td>
<td>9,000</td>
<td>63</td>
<td>225,000</td>
<td>13,500</td>
</tr>
<tr>
<td>Provo</td>
<td>14</td>
<td>48,000</td>
<td>3,000</td>
<td>21</td>
<td>72,000</td>
<td>4,500</td>
</tr>
<tr>
<td>Nephi</td>
<td>1</td>
<td>4,000</td>
<td>200</td>
<td>1.5</td>
<td>6,000</td>
<td>300</td>
</tr>
</tbody>
</table>

*Based on estimates of the Utah Seismic Safety Commission
**Assuming a 50% growth rate.
Impaired Hospitals (Day 1), Hospital Bed Availability, & Highway Functionality - Earthquake Scenario: Salt Lake City Segment, UT

M 7.0 Salt Lake City Segment

Highway Damage
Damage is expressed as the probability that a given bridge or highway segment will receive at least moderate damage.

<table>
<thead>
<tr>
<th>Major Roadway Bridge Impact</th>
<th>Highway Segment Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

Impaired Hospitals (Day 1)
Damage is expressed as the probability that a given hospital will be at least moderately damaged.

<table>
<thead>
<tr>
<th>County</th>
<th>Total # Hospital Beds</th>
<th>Hospital Beds Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box Elder</td>
<td>107</td>
<td>107</td>
</tr>
<tr>
<td>Cache</td>
<td>168</td>
<td>168</td>
</tr>
<tr>
<td>Davis</td>
<td>466</td>
<td>128</td>
</tr>
<tr>
<td>Juab</td>
<td>21</td>
<td>31</td>
</tr>
<tr>
<td>Salt Lake</td>
<td>3,286</td>
<td>230</td>
</tr>
<tr>
<td>Tooele</td>
<td>116</td>
<td>94</td>
</tr>
<tr>
<td>Utah</td>
<td>1,173</td>
<td>788</td>
</tr>
<tr>
<td>Wasatch</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Summit</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Weber</td>
<td>555</td>
<td>555</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6,094</strong></td>
<td><strong>2,143</strong></td>
</tr>
</tbody>
</table>

Pandemic Flu in Utah

Severity cannot be predicted
A pandemic as severe as that in 1918 would today cause, in Utah:

- 1 million ill
- 80,000 hospitalizations
- 13,000 ICU hospitalizations
- 6400 needing ventilator support
- 16,000 deaths
## Existing Medical Surge Capacity

### Table 1:
Emergency room capacity at Level I trauma centers, by city
(4:30 p.m., Tuesday, March 25, 2008)

<table>
<thead>
<tr>
<th>City</th>
<th>Patients Being Treated</th>
<th>Treatment Spaces (Capacity)</th>
<th>% of Capacity Being Treated in ER</th>
<th>Available Treatment Spaces</th>
<th>Available Treatment Spaces, as % of Surge at One Madrid Hospital (270 Casualties)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York City</td>
<td>943</td>
<td>829</td>
<td>114%</td>
<td>56</td>
<td>21%</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>286</td>
<td>246</td>
<td>116%</td>
<td>6</td>
<td>2%</td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>135</td>
<td>63</td>
<td>214%</td>
<td>None</td>
<td>0%</td>
</tr>
<tr>
<td>Chicago</td>
<td>203</td>
<td>152</td>
<td>134%</td>
<td>8</td>
<td>3%</td>
</tr>
<tr>
<td>Houston</td>
<td>123</td>
<td>154</td>
<td>80%</td>
<td>32</td>
<td>12%</td>
</tr>
<tr>
<td>Denver</td>
<td>81</td>
<td>88</td>
<td>92%</td>
<td>8</td>
<td>3%</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>52</td>
<td>57</td>
<td>91%</td>
<td>5</td>
<td>2%</td>
</tr>
</tbody>
</table>

Medical Surge Strategies

**Delay Care**
- Increase wait times for non-urgent issues
- i.e. clear waiting rooms, triage, delayed closure, delayed imaging, delay elective surgeries

**Degrade Care**
- Early discharge
- Use alternate care sites
- Expand scope of providers
  - standing orders
  - use of volunteers
- Resource-sparing strategies

**Deny Care**
- Refusal of aggressive care
- Withdrawal of care (reverse triage)
DISASTER TRIAGE

STEP 1
Is the Scene Safe?

Get Help

If you can hear me, walk or wave?

Yes

Assess Last

MINOR

DELAYED

EXPECTANT

IMMEDIATE

MMOR

DELAYED

Global Sort

Open Airway and then Respirations?

No

Respirations?

None

Distress

Pulse?

No

Yes

Mental Status?

Follows Commands?

No

Yes

Adequate resources to help?

No

Yes

DECEASED

Lifesaving Interventions

• Control major bleeding
• Rescue breaths for kids with a pulse
• Chest decompression
• Antidotes

Mark B. Shah, MD
Triage Challenges

How do you decide if a patient should be triaged as expectant or immediate?

How do you allocate limited resources in an ethical manner?
Prioritizing Care

Sickest first
- Routinely used in the ED
- Leads to heavy resource utilization by some who won’t survive

First-come, first-served
- Routinely used for ICU bed allocation
- Quickly use up resources in a disaster

Most likely to recover

Preserving the functioning of society
- Multiplier effect
- Vaccines vs Ventilators

CDC Publication: Ethical Considerations for Decision Making Regarding Allocation of Mechanical Ventilators during a Severe Influenza Pandemic
Maximizing Net Benefits

Maximize the number of lives saved
- All lives have equal value

Maximize years of life saved
- Used in organ transplant

Maximize adjusted years of life saved
- Difficult to measure
- Open to bias

Life Cycle Principle

CDC Publication: Ethical Considerations for Decision Making Regarding Allocation of Mechanical Ventilators during a Severe Influenza Pandemic
Prioritizing Care

Likelihood and duration of benefit
Change in quality of life
Urgency of need
Amount of resources required
Age and functional assessment
Underlying health, prognosis
Disasters and the Disabled

People with disabilities comprised 25 to 30 percent of those impacted by Hurricane Katrina.

50% of the people who died in New Orleans were over 75 years, but were only 11.7% of total population.

Over 35% of those who did not evacuate in Katrina were either physically unable to leave or were caring for a person with a disability.
Prioritizing Care Further Disenfranchises the Disenfranchised

least likely to benefit
benefit duration the shortest
require most resources
least likely to return to baseline
poorest functional assessment
poorest underlying health
lowest functional assessment rank
age will be mostly elderly
poorest prognosis
Provider Responsibilities

“Individual physicians have an obligation to provide medical care during disasters...even in the face of greater than usual risks to their own safety, health, or life.”

American Medical Association
Provider Responsibilities

Consider difficult decisions that you may need to make and develop guidelines to help with these decisions.

Identify conservation and rationing protocols that can be implemented to enhance your ability to provide treatment to an increased number of patients.

Consider your own “duty to care” when working conditions become difficult and maybe unsafe.
Palliative Care

Palliative sedation
- Doses of medications to relieve suffering
- Intent is to relieve suffering

Euthanasia
- Doses of medications that go beyond symptom relief
- Intent is to cause death

Sheri Fink. “Five Days at Memorial”
Disaster Response is Full of Challenges

**Rationing**
- Allocation of scarce resources
- Triage

**Restrictions**
- Isolation and quarantine
- Limit freedom and liberty of patients and providers

**Responsibilities**
- Duty to care for patients
- Duty to care for self and family
Resiliency

*Personal resiliency*
  - Maintaining good physical and mental health

*Family/home/community resiliency*
  - Family emergency plan and supplies
  - Strengthening connections with your community

*Work/professional resiliency*
  - Learning your role as a disaster responder
  - Learning tools to be more effective
  - Participate in planning and practice
Haiti 2010
Philippines 2013
Crisis Resource Management

Set of skills required for effective teamwork in a crisis situation

Crew Resource Management developed to address the 70% of airline crashes due to human error from teamwork failure

Improves performance and reduces errors
# Factors Affecting Performance of Complex Tasks

<table>
<thead>
<tr>
<th>Individual</th>
<th>Team</th>
<th>Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue</td>
<td>Role confusion</td>
<td>Interruptions</td>
</tr>
<tr>
<td>Emotions (anger, stress)</td>
<td>Authority gradient</td>
<td>Noise</td>
</tr>
<tr>
<td>Illness</td>
<td>Ineffective communication</td>
<td>Handovers</td>
</tr>
<tr>
<td>Inexperience</td>
<td></td>
<td>Equipment failure</td>
</tr>
<tr>
<td>Lack of knowledge</td>
<td></td>
<td>Unfamiliar equipment or place</td>
</tr>
</tbody>
</table>
Crisis Resource Management

Global assessment
Teamwork
Closed-loop
Communication
Practice and Plan
Crisis Resource Management

Global assessment (*size-up*)

- Anticipate and plan for contingencies
- Know your equipment
- Logically structured and well labelled environment
- Use cognitive aids (checklists)
- Think out loud and share ideas
- Avoid “fixation”
- Continually review the plan
Job Action Sheet

Code Disaster: Lead Hospital Unit Physician Job Action Sheet

Task #1 – Assume your role:
- Identify yourself as the Lead Physician for your Unit by putting on the appropriate orange vest from the disaster box and take and turn a radio.
- Notify your unit’s Charge Nurse, the Operations Section Chief or Inciident Commander (located in the Command Center), and the other staff in your unit of your position.

Task #2 – Global Assessment:
- Obtain a briefing from the Charge Nurse, and the Operations Section Chief or Incident Commander.
- Define the mission and identify objectives (i.e. decompress the ED and ICU, receive and stabilize patients).
- Refer to the Emergency Operations Plan as needed.
- Anticipate potential issues and problems and develop potential solutions.
- Organize the physicians in your unit, and assign physicians to different roles and responsibilities (directing rapid disposition of existing patients, preparing for new patients).
- Work closely with the charge nurse to identify current and expected shortages and surpluses of staff, supplies, equipment, and medications; and help assign roles and responsibilities.
- Call in additional staff as needed by utilizing the Command Center.

Task #3 – Reassess Existing Patients:
- Identify and prepare appropriate patients for early discharge from the hospital (to home or care facility); work with your physicians, nurses, and care managers to expedite.

Task #4 – Prepare your Unit:
- Reorganize the unit as needed to accommodate a surge of patients. Consider non-patient care areas, such as the lobby and hallways. Doubling your capacity may be required.
- Communicate with Operations Section Chief regarding your patient care status and potential capacity, as well as anticipated staff and supply shortages.

Task #5 – Ongoing Disaster Operations:
- Supervise triage and movement of patients into the unit.
- Work closely with the Lead ED Physician and Lead ICU Physicians regarding patient care capacity and prioritization.
- Communicate as often as needed with your Charge Nurse, the Operations Section Chief, and other staff; utilize closed-loop communication, radios, and runners as needed.
- Observe staff for signs of stress and reassign roles and responsibilities as needed.
- Work with Operations Section Chief and Charge RN to call in additional staff as needed.
- Make adjustments as needed.
Crisis Resource Management

Global assessment

Teamwork

- Follow chain of command, but share ideas (Incident Command Structure)
- Role clarity
- Establish and maintain the team’s shared mental model of the plan
- Distribute workload
- Recognize stress in yourself and others
Crisis Resource Management

Global assessment

Teamwork

Closed-loop Communication

• Distribute needed information to the team
• Resolve conflict
• Facilitate collaborative efforts
• Call for help early
Crisis Resource Management

Global assessment
Teamwork
Closed-loop Communication

Practice and Plan

- Increase our experience with low frequency events
- Use reality based training to develop appropriate reactions
Planning and Practice

“In preparing for battle, I have always found that plans are useless, but planning is indispensable”
Dwight Eisenhower

“Everybody has a plan until they get punched in the face”  Mike Tyson
## Risk vs Frequency Analysis

<table>
<thead>
<tr>
<th>Low Risk</th>
<th>High Frequency</th>
<th>Low Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk</td>
<td>Routine</td>
<td>Low Consequence</td>
</tr>
<tr>
<td>High Risk</td>
<td>Lots of Practice</td>
<td></td>
</tr>
</tbody>
</table>

Gordan Graham
Florida Sept 2004
Care Will Be Altered, But Should Be Appropriate and Consistent

Standards are developed and shared in advance
  • Clear Communication with public and stakeholders before and during an event
Triage personnel are identified and trained to an identifiable standard
  • Health care decision-making will be based on ethical standards
Care guidelines will be applied consistently, across medical facilities and health jurisdictions to the greatest degree possible

D. Grim. BCFS. “Crisis Care in Disasters”
Utah Crisis Standards of Care Plan

In year 2 of 5 in developing our plan.

Building on the Utah Pandemic Plan, the Utah EMS MCI Plan, and the Utah Burn Disaster Plan.

Draft document now developed.

Next steps include sharing the plan with more stakeholders and then the public.

Challenges – triage algorithms, legal issues
Critical Care Exclusion Criteria

Pre-existing Conditions

- Severe and irreversible chronic neurologic condition
- Known severe dementia
- Advanced untreatable neuromuscular disease
- Incurable metastatic malignant disease
- End-stage organ failure
  - Heart (CHF class III or IV)
  - Lung (COPD, CF, pulm fibrosis, pulm HTN)
  - Liver (PUGH >7)
- Age >95
Critical Care Exclusion Criteria

**Acute Conditions**

- Severe neurologic injury with minimal chance of functional recovery
- Severe trauma with revised trauma score <2
- Severe burns with <50% chance of survival
- Cardiac arrest without easily identifiable and reversible cause
Utah Legal Protections

**Good Samaritan Act**
- Protects non-negligent care if NO “duty to treat”

**Utah Emergency Medical Services Act**
- Protects expanded scope of practice if acting as a “Good Samaritan”

**Health Care Providers Immunity from Liability Act**
- Protects non-negligent care during a declared disaster, even if there is a “duty to treat”

Utah Code Sections: 78B-4-501, 26-8a-308, 58-13-2.6
Effective Disaster Responders

Understand the implications of Crisis Standards of Care
Lookout for High Risk / Low Frequency events
Practice Crisis Resource Management
Utilize disaster surge strategies
Participate in planning and practice

You Can Be a Hero to Someone in Need
Resources

Mark Shah: markbshah@gmail.com
ICDP: intermountainhealthcare.org/services/icdp
FEMA preparedness: www.ready.gov
Utah preparedness: bereadyutah.gov
CERT: citizencorps.utah.gov
MRC: utahmrc.org
DMAT: rogarcia@utah.gov