Immediate Bed Availability: Surge Capacity for Today’s Healthcare System

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Our Current Situation

• The United States health care delivery system is focused on cost reduction which includes service retraction resulting in “just-in-time” (JIT) operating principles and staffing.

• While United States health system emergency preparedness and response mechanisms are established and operational, they can be fragmented and are restrained by a JIT approach.

• The United States continues to experience overcrowding in emergency departments with limited mechanisms to reallocate patients throughout the hospital or the community.

• Our day to day system does not serve us well; therefore, it is not likely to serve us well on “game day.”

Preparedness and Health Care Delivery

National Healthcare System Capacity

Coalition Preparedness

Decreasing Capacity

100% Prepared

Gap

Coalitions

National Healthcare System Capacity
Preparedness and Health Care Delivery

Coalition Preparedness

National Healthcare System Capacity

100% Prepared

Gap

Coalitions
• National Health Expenditures grew 4.0% to $2.5 trillion in 2009, or $8,086 per person, and accounted for 17.6% of Gross Domestic Product (GDP).

• 2010, hospital expenditures were $814 Billion (CMS)
  - According to the American Hospital Association, there are 5,754 hospitals in the United States
  - Average Hospital Expenditures = approx $141 million

• The Hospital Preparedness Program 2012 budget is $347 million (0.0001% of overall National Health Expenditures)

Hospitals Failing to Address Patient Boarding, 2012, www.acepnews.com/index.php?id=514&tx_ttnews%5Btt_news%5D=1555&cHash=2125d52f1ab0ae31328f2440243e7f70
Our Current Need

- A comprehensive national preparedness and response health care system that is scalable and coordinated to meet local, state and national needs

- A dual use application to preparedness, integrating and improving the efficiencies of daily health delivery

- A financially sustainable approach to preparedness

- A population based health delivery model for disaster response

- Defined Healthcare Preparedness Capabilities and Performance Measures
1) Health Care System Preparedness (*Health Care Coalitions*)
2) Health Care System Recovery
3) Emergency Operations Coordination
5) Fatality Management
6) Information Sharing
10) Medical Surge (*Immediate Bed Availability*)
14) Responder Safety and Health
15) Volunteer Management

Capabilities:
Offense, Defense, Special Teams
Health Care Coalition (HCC)
“The whole is greater than the sum of its parts.”

Aristotle
“Of particular concern are questions about the ability of health care systems to ‘surge’, - that is, to have the staff and resources in place to adequately care for increased numbers of affected individuals or individuals with unusual or highly specialized needs.”

GAO Report, March 2013
National Preparedness: Improvements Needed for Measuring Awardee Performance in Meeting Medical and Public Health Preparedness Goals
Medical Surge

• Medical surge: An Achilles’ Heel
• A fault or weakness that causes or could cause someone or something to fail
The New “Medical Surge”: Immediate Bed Availability (IBA)

• Goal: To quickly provide higher-level care to more serious patients during a disaster with no new space, personnel, or equipment

• HPP 2012 Medical Surge Capability Performance Measure

• Ability (of coalitions) to provide no less than 20% bed availability of staffed members’ beds, within 4 hours of a disaster
The New “Medical Surge”

- Evidence Informed
- Operationally Tenable
- Economically Sustainable
- Ethically Grounded
Reverse Triage: Inpatients at low risk for untoward events would be discharged or transferred back to the community

Reverse Triage Study (Maryland: Kelen)

- Study: 3 hospitals, 19 week monitoring, 1,632 total beds
- Hospitals achieved a net surge capacity of 66-81% after accounting for non-disaster emergencies
- Majority of surge would have been available 24-48 hours after disaster

Source: Kelen, “Creation of Surge Capacity by Early Discharge of Hospitalized Patients at Low Risk for Untoward Events, Disaster Medicine and Public Health Preparedness, 2009.”
Every day, approximately 20% of hospital patients are discharged

Every day, even more patients may be available for discharge

- Clinically stable patients with few parenteral medications may be appropriate for early discharge
- Strategies to expedite discharge:
  - Discharge holding lounge
  - Convert private rooms to double rooms
  - Reopen closed areas
  - Utilize hallways
  - Convert patient areas to critical care areas
  - Temporary external structures for patient holding
  - “Flat space” (e.g. lobbies, waiting rooms, hallways) can open 10% operating bed capacity

Staffing is likely to be the key restriction on the number of patients that facilities and coalitions can accommodate. HCCs should consider:

- Protocols for revision of staff work hours
- Callback of off-duty personnel
- Use of non-clinical staff
- Local Medical Reserve Corps
- Untraditional patient care providers (e.g. family members, nonprofessional personnel such as city employees)
- Surge plans for home care agencies and clinics
- Fewer, larger staffed off-site facilities will benefit from economies of scale

Building disaster preparedness into existing healthcare systems makes the process economically sustainable

- Allows for surge capacity without extra “staff, space, or stuff”

Private partners and insurance companies need to be involved

- Billing will be an issue but can be mitigated through stakeholder buy in

During overwhelming disasters:

- Decisions must be made as to who can best be served
- Medical ethics grounded in: autonomy, beneficence, non-maleficence, and justice

Consent to “be triaged” is implicit in consent to give medical care:

- Applied in routine clinical care, military operations, public health, or population level emergencies
- Utilitarian vs. egalitarian, proportionality of care
- Victims of disaster treated equally to existing patients

IBA: Performance Measure
Medical Surge Measures

Percent of healthcare coalitions (HCCs) that have a coordinated mechanism established that supports their members’ ability both to deliver appropriate levels of care to all patients (including pre-existing patients [both inpatient and outpatient], non-disaster-related patients, and disaster-specific patients), as well as to provide no less than 20% bed availability of staffed members’ beds, within 4 hours of a disaster.
Sustainable “Medical Surge”

Surge within the System
“Medical Surge”

Former Construct

New Construct
IBA Concept

HCC Hospital(s)
- Stroke/MIs
- High Acuity Psychiatric patients
- ICU Patients
- Acute Surgical Patients
- Imminent OB delivery
- Convalescing
- Awaiting discharge
- Behavioral Health Issues
- Post Operative Care
- Acute
- Social Issues
- Elective Procedures

HCC Partner(s)
- Long Term Care
- Community Health Centers
- Home
Pillars of IBA

Continuous Monitoring
- Maintain operations
- Monitor patient acuity in real-time
- Continually establish disaster disposition protocols

Off-load
- Disaster disposition protocols utilized
- Rapid bed turnover
- Discharge or Transfer of lower acuity patients to coalitions partners/home
- Deferral of elective admissions/procedures etc.

On-load
- Redeploy existing resources to allow for higher-acuity admissions
HCC Hospital (Before & After IBA)

Normal Day

Off-Loading

On-Loading

EVENT

IBA Activated
IBA: Real World Experiences

- Continuous monitoring
- Off-loading
- On-loading
- Why this matters
82% of Healthcare Coalitions use electronic data and information sharing systems

Examples of systems: WebEOC, Health Alert Networks (HAN), and bed tracking systems

70% of Healthcare Coalitions have tested communication systems protocols internally and with relevant stakeholders

Communication between coalitions is less prevalent
Reverse Triage in Practice (Royal Darwin Hospital: 2009)

- Event: Boat explosion injured 30 asylum seekers
- Royal Darwin Hospital was full with ED backlog
- Disaster Response Team activated reverse triage
- Elective procedures cancelled, multidisciplinary teams assessed patients, increased use of community care (nursing facilities), discharged patients
- In 4 hours, 56 beds were available (16% of capacity)
- Only one patient returned for further treatment

IBA: Real World Experiences
Off-loading: Hurricane Sandy, 2012

• “Where possible, investments should be coordinated across multiple institutions, using health care coalitions to ensure resiliency.”

• Improved Situational awareness

• Drilled evacuation (IBA off-load)
  – “Measured success” in Sandy with transport

• Improved clarity of criteria and triggers for evacuation

Strategies used during January 2013 seasonal influenza:

- Expedited patient case management (discharge planning techniques)
- Decompressed inpatient wards
- Isolated hospitals cancelled elective admissions and procedures

Source: Health System Stress Assessment, OPEO, 2013.
• Implementation of 24/7 open trauma bed protocol to facilitate rapid admission from ED
• Required maintenance of **daily bump list and timely transfer of patients**
• Hypothesis: ED LOS + mortality would decrease after admission

• Results:
  — Decreased ED LOS in all patients and lower mortality rates in the most severely injured patients.
  — Improved throughput was achieved without an increase in unplanned readmissions to SIC

Rashid Hospital, Dubai, UAE

- 500 bed tertiary care hospital
- Constantly over bed capacity
- Disaster activation 10 times in 3 years
- Disaster response challenges: lack of bed space, congested ORs, uncoordinated medical management

Rashid Hospital, Dubai, UAE

- Root cause analysis
- Physicians continuing with “normal business” (e.g. ward rounds, patient assessments) in spite of disaster status
- No system or recognition for need for reverse triage
- ORs continue with routine cases with lack of leadership in this area

• Reverse triage based on “lifeboat ethics”
• Transfer to other facilities if specialist interventions not required within 24 hours
• Increasing bed capacity and routinely clear patients
  – Hospitalists
  – Extended discharge lounge facilities
  – Liaison with construction companies regarding expatriate patients’ “transport home”
  – Liaison with local police to allow access

Medical Team Member Guidelines during 3333 and 4444 Disasters

Any problems or concerns during a Disaster? Call the Disaster Control Centre, 1189

Specific Medical Team Member's Responsibilities

- Attendance at units and wards where you have patients.
- Assessment of all patients under your care for possible discharge.

[Reverse Triage]

(This should take place as the priority of every team member).

- Writing of discharge orders and discharge summaries.
- Prescribing of medications to take away.
- Liaison with Nursing Staff for efficient patient discharge
- Identification of patients who cannot be discharged but may be suitable for transfer to other facilities or to the Primary Healthcare Clinics.
- Reduction of routine patient flow through areas such as OT, CT, and X-Ray in order to free up these areas for the admission of emergency patients.

On-loading takes place in ED everyday, and will continue to take place regardless of challenges of space, staff, stuff.

The continuous monitoring and off-loading of IBA allows on-loading to take place in an efficient manner that does not compromise patient care.
On March 11, 2004, 10 terrorist explosions occurred almost simultaneously on commuter trains in Madrid killing 177 people instantly and injuring more than 2,000.

That day, 966 patients were taken to 15 public community hospitals. More than 270 patients arrived at the closest facility between 0800 and 1030 hours.
IBA: Real World Experiences
On-loading: Madrid Terrorist Bombing, 2004
Pre-hospital

- Multiple, simultaneous attacks
- Enormous casualty numbers
- Triage = “alive” versus “dead”
- TM ruptures = difficult communication
Hospital

- Nonexistent EMS-to-hospital communications
- Misdistribution of patients (e.g. 2 of 15 hospitals receiving ~60% of causalities)
- Enormous numbers of medical personnel required
- Damage control at every point of care (not just surgery!)
International Lessons Observed, Every Time

Injured and dead will arrive at closest hospital

Closest hospital is unable to meet the demand = functional “collapse”

Compelling need to distribute patients
How do you take care of 272 patients in 2.5 hours?

How would you respond today?
Why This Matters

Overtriage and Critical Mortality

Frykberg E, J Trauma, 53(2): 201-212, 2002 Aug
Immediate Bed Availability

- **Everyday preparedness for game day**

- **Weaving a thread of preparedness into the daily delivery of care**
Questions