CARE DURING CRISIS

LET’S INCLUDE THE CHILDREN

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Non Disclosure

- The presenter has no financial relationships to disclose.
- The views presented do not represent the Department of Defense of the University of Maryland.
- Commercial support was not received for this activity.
Agenda

- Challenges with optimizing healthcare delivery during crises-Problem statement
- Healthcare delivery 101
- Describe the vision
- “Linking” solutions
- Potential future
Objectives

- Understanding pediatric preparedness tenants, that if employed, actually strengthen daily healthcare delivery
- Discussing healthcare executives perspectives on preparedness
- Explain the linkage between daily healthcare delivery policy, priorities and care with healthcare delivery during disasters
- The importance of understanding care in crisis, immediate bed availability, and the risks to patients and facilities of not being prepared
THE MONSTERS NEXT DOOR
WHAT MADE THEM DO IT?
Emergency Department Visits and Emergency Departments\(^{(1)}\)

in Community Hospitals, 1991 - 2011

Source: Avalere Health analysis of American Hospital Association Annual Survey data, 2011, for community hospitals.

\(^{(1)}\) Defined as hospitals reporting ED visits in the AHA Annual Survey.
ER visits still rising despite ACA

- JAN 2015 Modern Healthcare:
  - “Patient emergency room visits rose sharply at hospitals with the highest ER use in 2013, the last year before the Affordable Care Act's insurance expansion kicked in... and many of the hospitals with the busiest ERs in 2013 are reporting even higher volumes in 2014 despite the nation's declining uninsured rate.”

- The article goes on to describe that the nation's 24 busiest emergency rooms reported 18.7% more visits in 2013 over 2012

- It appears this trend will continue
National Healthcare System Capacity

Decreasing Capacity

Health Care Delivery during Crises

Hospital/coalition Readiness

100% Ready

Gap

Hospitals/coalition

National Healthcare System Capacity
Seems slide 7 is "Today", and slide 8 is "Future". Considering titling slides as such.

DHHS, 10/22/2012
Health Care Delivery during Crises
Geographic Dispersion of HPP Healthcare Coalitions
Hospital Referral Regions
ACOs by Hospital Referral Region

ACOs
- 10+
- 6-9
- 4-5
- 3
- 2
- 1
- 0
Health Disparities

To zoom in on a region, move your cursor over the region of interest and scroll your mouse wheel (scroll-up). To zoom back out, scroll-down. Chrome is recommended.

Prevalence (% per year)
- < 12
- 12 to 13
- 13 to 14
- 14 to 15
- 15 to 16
- 16 to 17
- 17+

Shading indicates urban counties.
Insufficient Data

Data Last Updated: March 8, 2016
THE GREAT DIVIDE

- Healthcare
  - $3 trillion
  - Social Security Act
  - Balanced Budget Act
  - Finance Committee
  - Ways and Means Committee
  - CMS/ONC

- Healthcare “Preparedness”
  - $235 million
  - Pandemic and All Hazards Preparedness Act (reauth)
  - HELP Committee
  - Energy and Commerce Committee
  - ASPR/CDC
Landmark Clinical Trials and their current rate of use

<table>
<thead>
<tr>
<th>Clinical Procedure</th>
<th>Landmark Trial</th>
<th>Current Rate of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flu Vaccine</td>
<td>1968</td>
<td>64% (2000)</td>
</tr>
<tr>
<td>Thrombolytic Therapy</td>
<td>1971</td>
<td>20% (2000)</td>
</tr>
<tr>
<td>Pneumococcal vaccine</td>
<td>1977</td>
<td>53% (2000)</td>
</tr>
<tr>
<td>Beta blockers after MI</td>
<td>1982</td>
<td>92.5% (2001)</td>
</tr>
<tr>
<td>Mammography</td>
<td>1982</td>
<td>75.5% (2001)</td>
</tr>
<tr>
<td>Cholesterol screening</td>
<td>1984</td>
<td>69.1% (1999)</td>
</tr>
<tr>
<td>Fecal occult blood test</td>
<td>1986</td>
<td>20.6% (1999)</td>
</tr>
</tbody>
</table>

YOU CANT GET THERE FROM HERE
Problem Statement

- The US healthcare system has no requirements and is not incentivized to deliver optimal healthcare in disasters to optimize a patient’s or a population’s health.

- The US healthcare delivery system is focused on cost reduction, including service retraction and an emphasis on out-patient management, resulting in “just-in-time” (JIT) operating principles and staffing negating medical surge.

- The United States health system emergency preparedness and response mechanisms are established but undeveloped. They often are fragmented, divorced from daily health delivery practice patterns and restrained by economic realities.

- The US emergency care delivery system continues to experience overcrowding, with limited mechanisms to reallocate patients throughout the hospital or the community.
Healthcare
What 183 C-suite executives told the Advisory Board-May 2017

- The top six issues were:
  - *Improving ambulatory access* (57% assigning an "A" grade)
  - *Innovative approaches to expense reduction* (57%)
  - *Boosting outpatient procedural market share* (55%)
  - *Minimizing unwarranted clinical variation* (54%)
  - *Controlling avoidable utilization* (49%)
  - *Exploring diversified, innovative revenue streams* (48%)
## Payment Taxonomy Framework

<table>
<thead>
<tr>
<th>Category 1: Fee for Service—No Link to Quality</th>
<th>Category 2: Fee for Service—Link to Quality</th>
<th>Category 3: Alternative Payment Models Built on Fee-for-Service Architecture</th>
<th>Category 4: Population-Based Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Payments are based on volume of services and not linked to quality or efficiency</td>
<td>At least a portion of payments vary based on the quality or efficiency of health care delivery</td>
<td>Some payment is linked to the effective management of a population or an episode of care. Payments still triggered by delivery of services, but opportunities for shared savings or 2-sided risk</td>
</tr>
<tr>
<td>Medicare FFS</td>
<td>• Limited in Medicare fee-for-service • Majority of Medicare payments now are linked to quality</td>
<td>• Hospital value-based purchasing • Physician Value-Based Modifier • Readmissions/Hospital Acquired Condition Reduction Program</td>
<td>• Accountable care organizations • Medical homes • Bundled payments • Comprehensive primary care initiative • Comprehensive ESRD • Medicare-Medicaid Financial Alignment Initiative Fee-For-Service Model</td>
</tr>
</tbody>
</table>
Target percentage of Medicare FFS payments linked to quality and alternative payment models in 2016 and 2018

2016
- All Medicare FFS (Categories 1-4): 30%
- FFS linked to quality (Categories 2-4): 85%
- Alternative payment models (Categories 3-4): 90%

2018
- All Medicare FFS (Categories 1-4): 50%
- FFS linked to quality (Categories 2-4): 90%
- Alternative payment models (Categories 3-4): 90%
The mother ship has landed. On Wednesday, April 27, the Centers for Medicare and Medicaid Services (CMS) released the highly anticipated proposed rule that would establish key parameters for the new Quality Payment Program, a framework that includes the Merit-based Incentive Payment System (MIPS) and Alternative Payment Models (APMs). These policies were established by the latest, permanent 'doc fix,' the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA).

For additional background, please refer to recent Health Affairs Blog posts on MACRA, MIPS, and APMs, as well as a comprehensive brief on MACRA. This post briefly outlines the key elements of the proposed rule.

**MIPS**

The proposal defines which eligible clinicians will initially participate in the Quality Payment Program via MIPS, with CY 2017 proposed as the first performance period on which CMS plans to base the CY 2019 payment adjustment. Eligible clinicians include physicians, physician assistants, nurse practitioners, clinical nurse specialists, certified registered nurse anesthetists, and groups that include such clinicians.

As outlined in MACRA, the proposal would consolidate three currently disparate Medicare quality programs into MIPS: (1) the Physician Quality Reporting System; (2) the Value-Based Modifier Program; and (3) the Hospital Value-Based Purchasing - EHR Incentive Program.
Four MIPS\(^1\) Categories Make up Total Performance Score

### Relative Weight of Each MIPS Category Over Time

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Relative Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>Clinicians must select 6 measures of the over 200+ available to report to CMS; score in this category not just awarded for reporting, but for high performance.</td>
<td><img src="#" alt="Difficulty Level" /></td>
</tr>
<tr>
<td>Resource Use</td>
<td>Points awarded for cost savings; clinician scores based on Medicare claims, no reporting required.</td>
<td><img src="#" alt="Difficulty Level" /></td>
</tr>
<tr>
<td>Clinical Practice Improvement</td>
<td>New category that rewards clinicians for clinical practice improvement activities; over 90 activities to choose from.</td>
<td><img src="#" alt="Difficulty Level" /></td>
</tr>
<tr>
<td>Advancing Care Information</td>
<td>Tracks clinicians EHR(^2) use offering partial credit, can report as individual or group.</td>
<td><img src="#" alt="Difficulty Level" /></td>
</tr>
</tbody>
</table>

CEOs Top Challenges in Pediatric Health Care

- **Future workforce**
  - A 2012 Children’s Hospital Association survey of nearly 70 children’s hospitals across the country revealed ongoing vacancies of 12 months or longer among key pediatric specialties—such as neurology, general surgery and developmental/behavior health

- **Lack of research funding**
  - The average number of research applicants who consistently receive grant funding is 7 percent.

- **Changing reimbursement models**
  - 70 percent of Children’s Hospital of Michigan patients are on Medicaid, so understanding how reimbursement will change if they’re covered by a health insurance exchange plan is crucial.
CEOs Top Challenges in Pediatric Health Care

- **Competition, collaboration, consolidation**
  - *Children’s hospitals often see their biggest competition as each other.*
  - *If children’s hospitals compete with each other to the point of putting others out of business, it could limit access to care.*
  - *Instead of competing, consider for example, what would happen if multiple children’s hospitals within the same market pooled resources or data and formed a nonprofit research entity. All of the hospitals involved, and their patients, would benefit.*

- **Partnerships and data sharing**
  - *Nearly 40 Children’s Hospital Association member hospitals have combined forces in a common group purchasing organization (GPO) to reduce costs and also connect purchasing information with pediatric evidence-based operational and clinical data.*
  - *GPO participants access an integrated database that uses administrative data for benchmarking and performance improvements across the continuum-of-care.*
  - *CHOP’s partnership with the Beijing Genomics Institute and Boston Children’s partnership with Claritas Genomics.*
  - *Of CHOP’s $2.2 billion annual revenue, approximately $100 million comes from international efforts.*
Are U.S. Soldiers Dying From Survivable Wounds? Despite Advances in Care, the Military Failed to Save Some Troops in Iraq and Afghanistan From 'Potentially Survivable' Wounds

By Michael M. Phillips

A U.S. Army soldier receives medical assistance after being injured by an explosive in Afghanistan in 2012. Agence France-Presse/Getty Images

In an unassuming building in suburban Washington, a team of military medical specialists spent six months poring over autopsies of 4,016 men and women who had died on the battlefields of Iraq and Afghanistan.
Could They Have Survived?

Over six months, a team of military doctors reviewed 4,596 autopsies of troops killed in Iraq and Afghanistan between Oct. 2001 and June 2011. Of those men and women...

- **4,016** died before they reached a surgeon, of which...
  - **976** had ‘potentially survivable’ wounds, of which...
    - **888** bled to death.
    - **598** suffered a hemorrhage within the torso
    - **171** died of bleeding where arms or legs meet torso
    - **119** incurred fatal wounds to the extremities
A NATIONAL TRAUMA CARE SYSTEM
Integrating Military and Civilian Trauma Systems to Achieve ZERO Preventable DEATHS After Injury

The National Academies of SCIENCES • ENGINEERING • MEDICINE
Committee on Military Trauma Care’s Learning Health System and Its Translation to the Civilian Sector

Donald Berwick (Chair), Institute for Healthcare Improvement
Ellen Embrey, Stratitia, Inc., and 2c4 Technologies, Inc.
Sara F. Goldkind, Goldkind Consulting, LLC
Adil Haider, Brigham and Women’s Hospital, and Harvard University
COL (Ret) John Bradley Holcomb, University of Texas Health Science Center
Brent C. James, Intermountain Healthcare
Jorie Klein, Parkland Health & Hospital System
Douglas F. Kupas, Geisinger Health System
Cato Laurencin, University of Connecticut
Ellen MacKenzie, Johns Hopkins University School of Hygiene and Public Health
David Marcozzi, University of Maryland School of Medicine

C. Joseph McCannon, The Billions Institute
Norman McSwain, JR., (until July 2015), Tulane Department of Surgery
John Parrish, Consortia for Improving Medicine with Innovation and Technology (CIMIT); Harvard Medical School
Rita Redberg, University of California, San Francisco
Uwe E. Reinhardt, (until August 2015), Princeton University
James Robinson, Denver Health EMS-Paramedic Division
Thomas Scalea, R. Adams Cowley Shock Trauma Center, University of Maryland
C. William Schwab, University of Pennsylvania
Philip C. Spinella, Washington University in St. Louis School of Medicine
Empiricism is the theory that important knowledge can be derived from experiential learning. Focused empiricism is a concept embraced by U.S. military medical leadership to capture its approach to process improvement under circumstances in which (1) high-quality data are not available to inform clinical practice changes, (2) there is extreme urgency to improve outcomes because of high morbidity and mortality rates, and (3) data collection is possible (Elster et al., 2013). A key principle of focused empiricism is using the best data available in combination with experience to develop clinical practice guidelines that, through an iterative process, continue to be refined until high-quality data can be generated to further inform clinical practice and standards of care.
Study Sponsors

- American College of Emergency Physicians
- American College of Surgeons
- National Association of Emergency Medical Technicians
- National Association of EMS Physicians
- Trauma Center Association of America
- U.S. Department of Defense’s U.S. Army Medical Research and Material Command
- U.S. Department of Homeland Security’s Office of Health Affairs
- U.S. Department of Transportation’s National Highway Traffic Safety Administration
The Imperative
- The U.S. service members the nation sends into harm’s way and every American should have the best possible chance for survival and functional recovery after injury.

The Urgency
- Military burden: ~6,850 service member deaths in Iraq and Afghanistan. Nearly 1,000 from potentially survivable injuries.
- Civilian burden: 147,790 U.S. trauma deaths in 2014 - as many as 30,000 may have been preventable with optimal trauma care.
- Threats from active shooter and other mass casualty incidents.
- As wars end and service members leave the military, the knowledge, experience and advances in trauma care gained over past decade are being lost.

The Opportunity
- Existence of a military trauma system built on a learning system framework that has achieved unprecedented survival rates for casualties.
- Organized civilian trauma system that is well positioned to assimilate recent wartime trauma lessons learned and serve as a repository and incubator for innovation during the interwar period.
Findings and Recommendations

The Aim (Rec 1)

The Role of Leadership
- National-Level Leadership (Rec 2)
- Military Leadership (Rec 3)
- Civilian Sector Leadership (Rec 4)

An Integrated Military–Civilian Framework for Learning to Advance Trauma Care
- Improving the Collection and Use of Data (Rec 5)
- A Collaborative Research Infrastructure in a Supportive Regulatory Environment (Recs 7 and 8)
- Systems and Incentives for Improving Transparency and Trauma Care Quality (Recs 9 and 10)
- Developing Expertise (Recs 6 and 11)
Estimated Percentage of Children Who Lived within 30 Miles of a High-Level Pediatric Trauma Center, by State, 2011-2015

Sources: GAO analysis of American Trauma Society and U.S. Census Bureau data (data); Map Resources (map). | GAO-17-334
What GAO Found

- GAO estimates that 57 percent of the 73.7 million children in the United States during the period 2011-2015 lived within 30 miles of a pediatric trauma center that can treat all injuries regardless of severity.

- In areas without pediatric trauma centers, injured children may have to rely on adult trauma centers or less specialized hospital emergency departments for initial trauma care.

- Some studies GAO reviewed, including nationwide studies, found that children treated at pediatric trauma centers have a lower mortality risk compared to children treated at adult trauma centers and other facilities, while other state-level studies GAO reviewed found no difference in mortality.

- Further, some studies GAO reviewed and stakeholders GAO interviewed suggest that more information is needed on outcomes other than mortality for children treated at pediatric trauma centers because mortality can be a limited outcome measure, as overall mortality is low among severely injured children.
TABLE II. Causes of Pediatric Traumatic Death by Age Group in Harris County, Texas (2004–2008)

<table>
<thead>
<tr>
<th>Age, yr</th>
<th>Accident</th>
<th>Homicide</th>
<th>Suicide</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>10 (40)</td>
<td>15 (60)</td>
<td>0</td>
<td>25 (14)</td>
</tr>
<tr>
<td>1–4</td>
<td>56 (71)</td>
<td>23 (29)</td>
<td>0</td>
<td>79 (45)</td>
</tr>
<tr>
<td>5–9</td>
<td>19 (83)</td>
<td>4 (17)</td>
<td>0</td>
<td>23 (13)</td>
</tr>
<tr>
<td>10–15</td>
<td>32 (66)</td>
<td>8 (17)</td>
<td>8 (17)</td>
<td>48 (27)</td>
</tr>
<tr>
<td>Total</td>
<td>117 (67)</td>
<td>50 (29)</td>
<td>8 (5)</td>
<td>175</td>
</tr>
</tbody>
</table>

Data are presented as number and percentage.
**TABLE I.** Characteristics of Pediatric Traumatic Deaths in Harris County, Texas (2004–2008)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Not Preventable</th>
<th>Preventable</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of deaths</td>
<td>152 (67)</td>
<td>23 (13)</td>
<td>175 (100)</td>
</tr>
<tr>
<td>Age, yr</td>
<td>5.9 (0.8–14.9)</td>
<td>5.0 (0.2–13.1)</td>
<td>5.7 (0.8–14.9)</td>
</tr>
<tr>
<td>Male sex</td>
<td>96 (63)</td>
<td>7 (30)</td>
<td>103 (59)</td>
</tr>
</tbody>
</table>

**Race**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>50 (33)</td>
<td>11 (48)</td>
<td>61 (35)</td>
</tr>
<tr>
<td>Black</td>
<td>46 (30)</td>
<td>8 (35)</td>
<td>54 (31)</td>
</tr>
<tr>
<td>Asian</td>
<td>2 (1)</td>
<td>0</td>
<td>2 (1)</td>
</tr>
</tbody>
</table>

**Intent**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>NAT</td>
<td>25 (16)</td>
<td>9 (39)</td>
<td>34 (19)</td>
</tr>
<tr>
<td>Accident</td>
<td>105 (69)</td>
<td>12 (52)</td>
<td>117 (67)</td>
</tr>
<tr>
<td>Homicide</td>
<td>39 (26)</td>
<td>11 (48)</td>
<td>50 (29)</td>
</tr>
<tr>
<td>Suicide</td>
<td>8 (5)</td>
<td>—</td>
<td>8 (5)</td>
</tr>
</tbody>
</table>

**Manner**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor vehicle</td>
<td>95 (63)</td>
<td>10 (43)</td>
<td>104 (50)</td>
</tr>
<tr>
<td>Weapon</td>
<td>24 (16)</td>
<td>—</td>
<td>24 (14)</td>
</tr>
<tr>
<td>Animal</td>
<td>1 (1)</td>
<td>—</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Falls</td>
<td>10 (7)</td>
<td>3 (13)</td>
<td>13 (7)</td>
</tr>
<tr>
<td>Undetermined</td>
<td>15 (10)</td>
<td>4 (17)</td>
<td>19 (11)</td>
</tr>
<tr>
<td>Other</td>
<td>8 (5)</td>
<td>6 (26)</td>
<td>14 (8)</td>
</tr>
<tr>
<td>AIS head ≥5*</td>
<td>110 (72)</td>
<td>0</td>
<td>110 (63)</td>
</tr>
<tr>
<td>Hospital deaths</td>
<td>94 (62)</td>
<td>20 (87)</td>
<td>114 (66)</td>
</tr>
</tbody>
</table>

AIS = Abbreviated Injury Scale; NAT = non-accidental trauma

*The Abbreviated Injury Scale (AIS) is an anatomically based, consensus-derived global severity scoring system that classifies each injury by body region according to its relative importance on a 6-point ordinal scale (1 = minor and 6 = maximal). © 2006, Association for the Advancement of Automotive Medicine (http://www.aam1.org/ais).

Data are presented as mean and range or as number and percentage.
Methods

- **Study Design**
  - Web-based assessment of US EDs for pediatric readiness.

- **Setting**
  - EDs (excluding specialty hospitals and hospitals without an ED open 24 hours per day, 7 days per week).

- **Participants**
  - All 5017 ED nurse managers were sent a 55-question web-based assessment.
Results

■ Of the 5017 EDs contacted, 4149 (82.7%) responded, representing 24 million annual pediatric ED visits.

■ Among the EDs entered in the analysis, 69.4% had low or medium pediatric volume and treated fewer than 14 children per day.

■ The median WPRS was 68.9 (interquartile range [IQR], 56.1-83.6).

■ The median WPRS increased by pediatric patient volume, from 61.4 (IQR, 49.5-73.6) for low-pediatric-volume EDs compared with 89.8 (IQR, 74.7-97.2) for high-pediatric-volume EDs ($P < .001$).

■ The median percentage of recommended pediatric equipment available was 91% (IQR, 81%-98%).
Results

- The presence of physician and nurse PECCs was associated with a higher adjusted median WPRS (82.2 [IQR, 69.7-92.5]) compared with no PECC (66.5 [IQR, 56.0-76.9]) across all pediatric volume categories ($P < .001$).

- The presence of PECCs increased the likelihood of having all the recommended guideline components, including a pediatric quality improvement process (adjusted relative risk, 4.11; 95% CI, 3.37-5.02).

- Barriers to guideline implementation were reported by 80.8% of responding EDs.
Comment

- In 2006, the Institute of Medicine report on the future of emergency care in US health care systems recommended that “hospitals should appoint 2 pediatric emergency coordinators—one a physician—to provide pediatric leadership for the organization.”

- These data provide evidence for the importance of PECCs in ensuring pediatric readiness of EDs.

- The presence of PECCs is associated with improved compliance with published guidelines.

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Comment

- The importance for EDs to maintain a state of readiness to care for children cannot be overemphasized because day-to-day readiness affects disaster planning and response as well as patient safety.

- These data demonstrate improvement in pediatric readiness of EDs as compared with previous reports.

- Barriers to guideline implementation may be targeted for future initiatives by a national coalition whose goal is to ensure day-to-day pediatric readiness of our nation’s EDs.
We know relatively little about the quality and efficiency of pediatric health care and publicly report even less.

Compared to the care provided to Medicare beneficiaries, where extensive research and public information on utilization, costs, and outcomes is increasingly routine, pediatric health care often occurs within a black box where the type, quantity, and outcomes of care are unknown.

The reasons for the slow pace of developing health care metrics for pediatrics are multi-faceted, some simply by redirecting the nature of pediatric health care, and others the fragmented data sources that are frequently owned by private insurers and providers.
Pediatric Disaster Vulnerabilities

- Infants and toddlers may not have the cognitive or motor skills to escape from the scene of an incident.

- PPE is scary

- Allow families to stay together

- Take into consideration that infants when wet are slippery and will need a way to get them through the decontamination process - i.e. plastic buckets, car seats, stretchers.

- Infants and children are at increased risk for hypothermia
Doable Pediatric Procedures
Wearing PPE?

Examination
- Central, peripheral pulse

Procedures
- CPR
- AED defibrillator
- BVM
- Intubation - cuffed and uncuffed
- IO- powered
- Autoinjectors, IM syringes
- tourniquet
Medical Countermeasure Gaps

- The timely availability of appropriately dosed, safe, effective pediatric antidotes, supportive drugs and equipment for children of all ages and sizes is crucial.
- Lack of pediatric autoinjector - pralidoxime
- Lack of effective oxime
- Many of the MCMs are used off label – lack the requisite safety, and efficacy information
- Obesity dosing
- PPE difficulties
Pediatric Disaster Preparedness Education and Training

- There are no established role-specific national core competencies in disaster health for children.

- In the event of a significant disaster most of our children will have to be cared for by non-pediatric or generalist trained clinicians (such as emergency physicians, nurses and paramedics).
RETROFITTING A SYSTEM
Our Current Need

- A population based health delivery model for disaster response

- VISION: A comprehensive, requirement-driven national health care system that is integrated with health delivery, seamlessly scalable, sustainable and educated to meet local, state, regional and national needs during disasters
## Cross Cutting Concepts

<table>
<thead>
<tr>
<th>Healthcare</th>
<th>Right patient placement</th>
<th>Right prehospital care</th>
<th>Triage</th>
<th>Admitting processes</th>
<th>Care coordination</th>
<th>Patient Flow</th>
<th>Surgical capacity</th>
<th>Discharge planning</th>
<th>Populatation based mortality</th>
<th>Safety</th>
<th>Quality</th>
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<td>X</td>
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<table>
<thead>
<tr>
<th>“Preparedness”</th>
<th>Right patient placement</th>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Healthcare Operations

- How many ORs do you have available
- How many OR teams are ready
- How many CRNAs or anesthesiologists
- How many trauma surgeons
- How long to perform an emergency thoracotomy
- How long to perform an trauma exploratory laparotomy
- How fast do you turn over rooms
- Damage Control Resuscitation including MTP
1 Hospital’s Answer

- How many ORs do you have available-20
- How many OR teams are ready-6
- How many CRNAs or anesthesiologists-6
- How many trauma surgeons-4
- How long to perform an emergency thoracotomy-90mins
- How long to perform an trauma exploratory laparotomy-90mins
- How fast do you turn over rooms-30 mins
What is your adjusted mortality rate compared to the national injury age-adjusted mortality rate?

<table>
<thead>
<tr>
<th>Measurements</th>
<th>poor performance</th>
<th>medium performance</th>
<th>high performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess Staffing Costs</td>
<td>&gt;10%</td>
<td>5-10%</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Start-time tardiness (mean tardiness for elective cases/day)</td>
<td>&gt;80 min</td>
<td>45-60 min</td>
<td>&lt;45 min</td>
</tr>
<tr>
<td>Case cancellation rate</td>
<td>&gt;10%</td>
<td>5-10%</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Post Anesthesia Care Unit (PACU) admission delays (% workdays with at least one delay in PACU admission)</td>
<td>&gt;20%</td>
<td>10-20%</td>
<td>&lt;10%</td>
</tr>
<tr>
<td>Contribution Margin (mean) per operating room hour</td>
<td>&lt;$1,000/hr</td>
<td>$1-2,000/hr</td>
<td>&gt;$2,000/hr</td>
</tr>
<tr>
<td>Turnover Time (for all cases mean time from previous patient out of the OR to next patient in the OR including setup and cleanup)</td>
<td>&gt;40 min</td>
<td>25-40 min</td>
<td>&lt;25 min</td>
</tr>
<tr>
<td>Prediction Bias (bias in case duration estimates per 8 hours of operating room time)</td>
<td>&gt;15 min</td>
<td>5-15 min</td>
<td>&lt;5 min</td>
</tr>
<tr>
<td>Prolonged turnovers (% turnovers lasting more than 60 minutes)</td>
<td>&gt;25%</td>
<td>10-25%</td>
<td>&lt;10%</td>
</tr>
</tbody>
</table>

How long till the last red tag in the OR?

- 10 Red tag patients from a mass shooting
- Last patient 6 hours later
- Damage Control Resuscitation including MTP-?
The environmental context and operational focus primarily influenced process design of the cataract pathways. When pressed to further optimize their processes, hospitals can use these systematic benchmarking data to decrease the frequency of hospital visits, lead times and costs.
Discharge Times

More discharges before 11 am create bed capacity for late-night and early-morning ED patients

Patients on medical wards discharged before 11 am

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>End of pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>5.7</td>
<td>26.2</td>
</tr>
<tr>
<td>% change</td>
<td>+350%</td>
<td></td>
</tr>
</tbody>
</table>

Discharging almost all appropriate patients by 2 pm creates bed capacity for early-afternoon ED surge

Patients on medical wards discharged before 2 pm

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>End of pilot</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>37.6</td>
<td>61.2</td>
</tr>
<tr>
<td>% change</td>
<td>+65%</td>
<td></td>
</tr>
</tbody>
</table>

The result is a three-hour decrease in median admission time

- Patient receives ideal level of care sooner
- Staff is happier since patients arrive earlier in the day; shift changes are available
- Less overlap of admissions and discharges

Average during four weeks before pilot.

Average during last two weeks of pilot.

Source: McKinsey analysis of regional health system data.
Time is muscle-Door to Balloon time

- ED physician activates
- Single-call activation system
- Response team is available within 20–30 minutes
- Prompt data feedback
- Senior management commitment
- Team based approach
- Paramedics perform pre-hospital tests
Maintaining Healthcare and Outcomes in Disasters

Continuity of Healthcare Operations

Healthcare entities will maintain operations during crises and will be able to implement rapid recovery principles if rendered inoperable

Delivery of Care

Medical surge is the capability, from point of injury or illness through the medical system, to rapidly expand the ability to triage, diagnosis, treat and disposition presenting patients from the crisis and all other non-event related patients
Immediate Bed Availability (IBA)

- The ability of a healthcare community to provide no less than 20% bed availability of staffed members’ beds within four hours of a disaster
IBA

- Evidence informed
- Operationally tenable
- Economically sustainable
- Ethically grounded
Immediate Bed Availability

- Stroke/MIs
- High Acuity Psychiatric patients
- ICU Patients
- Acute Surgical Patients
- Imminent OB delivery
- Convalescing
- Awaiting discharge
- Behavioral Health
- Social Issues
- Acute
- Post Operative
- Elective Procedures Cancelled

HCC Partners

- Long Term Care
  - Community Health Centers
  - Home
Immediate Bed Availability: Making Room within the System

Former Construct

MED/SURG/OB
Step Down
ICU

Additional Surge

IBA Construct

MED/SURG/OB
Step Down
ICU

Additional Surge
Institute of Medicine
Crisis Standards of Care

<table>
<thead>
<tr>
<th>Normal operating conditions</th>
<th>Conventional</th>
<th>Coalescing</th>
<th>Contingency</th>
<th>Crisis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space</td>
<td>Usual patient care space fully utilized</td>
<td></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>Staff</td>
<td>Usual staff called in and utilized</td>
<td></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>Supplies</td>
<td>Cached and usual supplies used</td>
<td></td>
<td>Conservation, adaptation, and substitution of supplies with occasional re-use of selected supplies</td>
<td>Critical supplies lacking, possible re-allocation of life-sustaining resources</td>
</tr>
<tr>
<td>Standard of care</td>
<td>Usual care</td>
<td></td>
<td>Functionally equivalent care</td>
<td>Crisis standards of care</td>
</tr>
</tbody>
</table>

Indicator: potential for crisis standards
Trigger: crisis standards of care

Source: IOM Crisis Standards of Care Report
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
Madrid bombing

- Coordinated near-simultaneous attacks targeting commuter trains
- 191 dead
- More than 1,800 injured

- 1,000 acute care beds/healthcare systems
- 20% IBA=200 beds immediately avail/system
- 100 healthcare systems in the United States
- Madrid = 2,000 patients=10 systems engaged
- Across the U.S., 20,000 beds available—immediately
CMS finalizes rule to bolster emergency preparedness of certain facilities participating in Medicare and Medicaid

Date 2016-09-08

Title CMS finalizes rule to bolster emergency preparedness of certain facilities participating in Medicare and Medicaid

Contact press@cms.hhs.gov

CMS finalizes rule to bolster emergency preparedness of certain facilities participating in Medicare and Medicaid

Today, the Centers for Medicare & Medicaid Services (CMS) finalized a rule to establish consistent emergency preparedness and response requirements for facilities participating in Medicare and Medicaid in order to help ensure the health and safety of patients and staff.
CMS Emergency Preparedness Rule

Four Provisions for All Provider Types

- Risk Assessment and Planning
- Policies and Procedures
- Communication Plan
- Training and Testing

Emergency Preparedness Program
CMS Emergency Preparedness Rule

- **Emergency plan:** Based on a risk assessment, develop an emergency plan using an all hazards approach focusing on capacities and capabilities that are critical to preparedness for a full spectrum of emergencies or disasters specific to the location of a provider or supplier.

- **Policies and procedures:** Develop and implement policies and procedures based on the plan and risk assessment.

- **Communication plan:** Develop and maintain a communication plan that complies with both Federal and State law. Patient care must be well-coordinated within the facility, across health care providers, and with State and local public health departments and emergency systems.

- **Training and testing program:** Develop and maintain training and testing programs, including initial and annual trainings, and conduct drills and exercises or participate in an actual incident that tests the plan.
Health, Economics, And Preparedness: Considerations And Paths Forward
David Marcozzi and Benoit Stryckman
September 14, 2015
Centers for Medicare Medicaid Services (CMS) Proposed Rule: Medicare Program: Request for Information Regarding Implementation of the Merit Based Incentive Payment System, Promotion of Alternative Payment Models, and Incentive Payments for Participation in Eligible Alternative Payment Models

This is a Comment on the Centers for Medicare Medicaid Services (CMS) Proposed Rule: Medicare Program: Request for Information Regarding Implementation of the Merit Based Incentive Payment System, Promotion of Alternative Payment Models, and Incentive Payments for Participation in Eligible Alternative Payment Models

Comment

Request for Information Regarding Implementation of the Merit-based Incentive Payment System, Promotion of Alternative Payment Models, and Incentive Payments for Participation in Eligible Alternative Payment Models

In light of the recent Blue Ribbon Panel on Biodensefense Report (http://www.biodensefensestudy.org) and multiple disasters including the recent mass casualty in Paris, this comment is being submitted for consideration as an emergency preparedness and/or safety clinical practice improvement activity for hospital based APMs.

Today’s healthcare system has limited in-patient capacity. The lean and “just in time” hospital approach to staffing and resources remains at odds with disaster readiness and medical surge. As a result of these challenges, a new model for medical surge was created—Immediate Bed Availability (IBA). This measure is a patient-centered, population health based approach to delivering care in crisis and is consistent with the Institute of Medicine’s work on crisis standards of care (http://iom.nationalacademies.org/Reports12/Standards-of-Care-A-Systems-Framework-for-Catastrophic-Crisis-Response.aspx). Immediate Bed Availability aids and measures community resilience, weaving a thread of preparedness within our daily healthcare delivery construct. Grounded on operational, economic, academic and ethical tenets, IBA sets clear requirements for healthcare systems and hospital based APMs to care for victims of a mass casualty.

IBA is defined as the ability of a healthcare system to make available, within four hours, up to 20% of staffed in-patient beds to higher acuity patients during a disaster.

The measure’s foundations are built on lessons learned from prior disasters and are applicable to no-notice emergencies and long-term crises such as a pandemic. Operationally, the 4 pillars of IBA are: 1) To constantly assess in-patient census acuity and maintain de-escalation discharge plans for all admitted patients, 2) the ability to rapidly (within 4 hours) offload up to 20% of lower acuity in-patients from the hospital to other healthcare or home settings safely, 3) to be able to receive and care for higher acuity patients within the in-patient setting and 4) to track and document patient movement.

Immediate Bed Availability was presented to the National Quality Forum (http://www.qualityforum.org/ProjectDetail/Regionalized_Emergency_Medical_Services/ID5527_Report.aspx) and the Institute of Medicine, with support as a potential promising measure for disaster preparedness. Referenced several times in the NQF report, recommendation #14 states, “... quantitative measures of process and outcome should be combined with the more subjective assessments of preparedness and response and focus on specific objectives (i.e. were the goals of immediate bed availability met objectively or outcomes, such as having similar risk-adjusted outcomes during a disaster, which would indicate that a facility would have the flexibility to maintain the same standard of care during a crisis.”

Attachments (1)

IBA cont.
Recommendation 20

Provide the financial incentives hospitals need to prepare for biological events. Preparedness must be included within the health delivery reform efforts of CMS and private sector payers. Bioterrorism and highly infectious disease preparedness should be required for accreditation and the CMS funding that comes with it. Any financing strategy must be realistic, but must also account for all contingencies and associated hospital planning requirements.

**ACTION ITEMS:**

a. **Adopt a disaster preparedness portfolio.** The Administrator of CMS, in conjunction with ASPR, should seek the endorsement of the National Quality Forum and adopt, as part of its health delivery reform efforts, a disaster preparedness portfolio that includes Conditions of Participation, Interpretive Guidance, measures development for inclusion within value-based purchasing, and innovation projects. Preparedness measures should be included in the evolving Merit-Based Incentive Payment System program and link community, supplier, and provider resilience efforts to reimbursement and incentives.

b. **Link Centers for Medicare and Medicaid Services incentives and reimbursement to new accreditation standards.** Congress should authorize CMS to provide funding to those hospitals that meet these new accreditation standards for bioterrorism preparedness and preparedness for other highly infectious disease events.

Recommendation 21

Establish a biodefense hospital system. Hospitals are already stratified according to their abilities to treat patients according to various specialties. Applying this same approach to biodefense will result in better patient treatment, improved occupational health and safety, and more realistic expectations of hospitals.

**ACTION ITEMS:**

a. **Stratify hospitals.** The Secretary of Health and Human Services should establish a stratified system of hospitals with increasing levels of capability to treat patients affected by bioterrorism and other events involving highly pathogenic infectious diseases. A categorical rather than disease-specific approach should be used. Where possible, the Secretary should add biodefense responsibilities to Accountable Care Organizations, trauma centers, and hospital coalitions to expand their capabilities.

b. **Develop accreditation standards for each stratum.** The Administrator of CMS should develop accreditation standards by or with the Joint Commission, Det Norske Veritas, Health Facilities Accreditation Program, and Center for Improvement in Healthcare Quality, as well as certification and licensure associated with each level.

c. **Associate Centers for Medicare and Medicaid Services funding.** The Administrator of CMS should associate hospital funding with the ability to meet these accreditation standards for each stratum.
Summary

- Public and private resources, roles, and responsibilities for national health resiliency will continue to evolve relative to political will, the fiscal climate, and the frequency and scale of disasters.

- Health care organizations, insurers, communities, and the nation can improve health and health care delivery in disasters by using innovative strategies that incentivize and finance quality efforts for care during crisis.

- Payers, providers, and health care communities can link preparedness to day-to-day activities, capitalize on economies of scale, and develop regional value-based models for sustaining emergency preparedness.
Thank you.