Disaster Planning for California Hospitals

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New Ideas to Improve Health Care Delivery in Disasters

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Non Disclosure

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

Agenda

- What this is not — a preparedness discussion
- Problem statement and challenges
- Describe the vision
- Solutions

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NO.143 NAIM KHAN
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NO.175 FAREEDAN BEE
W/O NOOR MOHD
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FENWAY PARK
1 2 3 4 5 6 7 8 9 10 R H E
PHI
BOSTON
AT BAT
BALL
STRIKE
SOX


boston

Audience Participation

Outcomes in Mass Casualties?

Health Care 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 a trauma exploratory laparotomy
- How fast do you turn over rooms
- Damage Control Resuscitation including MTF

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One 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: 90 mins
- How long to perform a trauma exploratory laparotomy: 90 mins
- How fast do you turn over rooms: 30 mins

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What is your adjusted mortality rate compared to the national injury age-adjusted mortality rate?

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

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Macario A. Are Your Hospital Operating Rooms "Efficient"? Anesthesiology 2006; 105:237-40.

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How Long 'til the Last Red Tag in the OR?

- 10 red tag patients from a mass shooting
- Last patient 6 hours later
- Damage Control Resuscitation including MTF?

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Challenges

Wall Street Journal

19 September 2014

U.S. News

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

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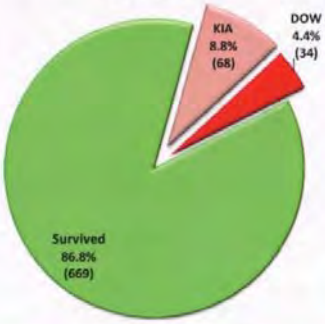
UNCLASSIFIED

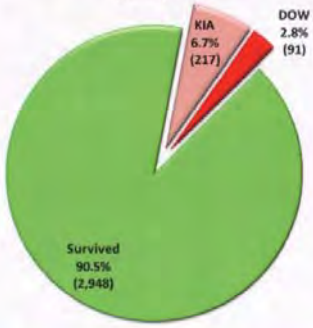
Golden Hour Directive (N = 4,027)

Before Jun 15, 2009
Goal < 90 min, Actual Median 90 min
(n = 771)



Golden Hour Directive

Jun 15, 2009 and After
Goal < 60 min, Actual Median 42 min
(n = 3,256)



Difference in KIA, Pre 9.5% (68/703) vs Post 7.1% (217/3,039), is **statistically significant, $p = 0.0434$**
Difference in DOW, Pre 4.4% (34/737) vs Post 2.8% (92/3,165), is **statistically significant, $p = 0.0271$**
Difference in Total Died (KIA + DOW), Pre 13.9% (101/669) vs Post 9.9% (327/3,256), is **statistically significant, $p = 0.0023$**

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An analysis of prehospital deaths: Who can we save?

Davis, James S. MD; Satahoo, Shevonne S. MD; Butler, Frank K. MD; Dermer, Harrison; Naranjo, Daniel MD; Julien, Katherina; Van Haren, Robert M. MD, MSPH; Namias, Nicholas MD, MBA; Blackbourne, Lorne H. MD; Schulman, Carl I. MD, PhD, MSPH

Results:

- 29% of the patient deaths were classified as a result of potentially survivable injuries given current treatment options, mostly from hemorrhage and chest injuries.

Conclusion:

- More than one of every five trauma deaths in our study population had potentially survivable injuries.

Where??

- Florida

J Trauma Acute Care Surg. 2014 Aug;77(2):213-8.
Davis JS1, Satahoo SS, Butler FK, Dermer H, Naranjo D, Julien K, Van Haren RM, Namias N, Blackbourne LH, Schulman CI.

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LANDMARK CLINICAL TRIALS

AND THEIR CURRENT RATE OF USE

CLINICAL PROCEDURE	LANDMARK TRIAL	CURRENT RATE OF USE
FLU VACCINE	1968	64% (2000)
THROMBOLYTIC THERAPY	1971	20% (2000)
PNEUMOCOCCAL VACCINE	1977	53% (2000)
DIABETIC EYE EXAM	1981	48.1% (2000)
BETA BLOCKERS AFTER MI	1982	92.5% (2001)
MAMMOGRAPHY	1982	75.5% (2001)
CHOLESTEROL SCREENING	1984	69.1% (1999)
FECAL OCCULT BLOOD TEST	1986	20.6% (1999)

BALAS EA, BOREN SA. MANAGING CLINICAL KNOWLEDGE FOR HEALTH CARE IMPROVEMENT. YEARBOOK OF MEDICAL INFORMATICS 2000.

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Problem Statement

The U.S. health care system has no requirements and is not incentivized to deliver optimal health care in disasters to optimize a patient's or a population's health.

- The U.S. health care 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 U.S. 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 U.S. emergency care delivery system continues to experience overcrowding, with limited mechanisms to reallocate patients throughout the hospital or the community.

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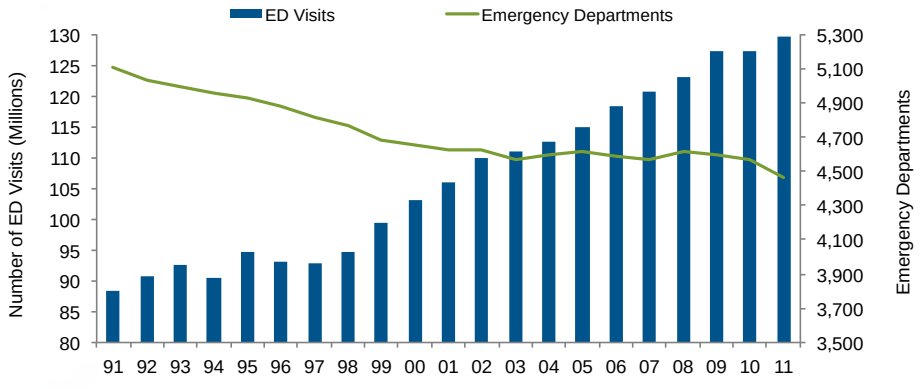
Emergency Department Visits and Emergency Departments(1) in Community Hospitals, 1991–2011



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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.

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ER Visits Still Rising Despite ACA

- January 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

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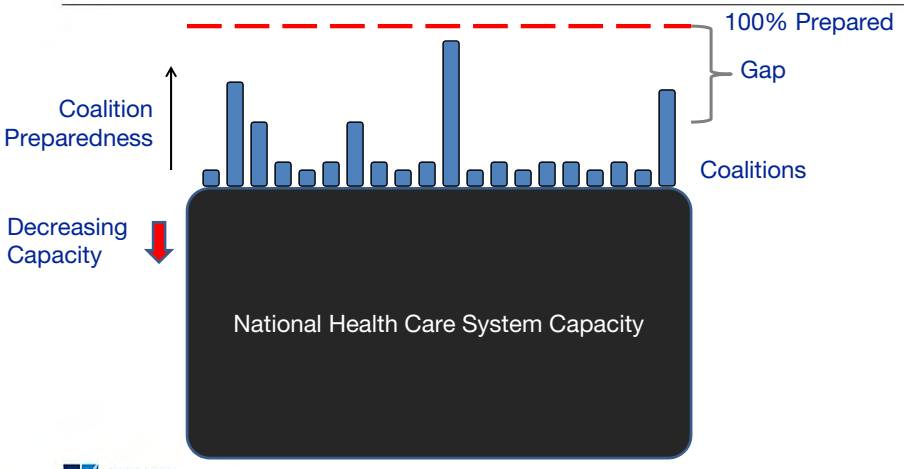
Health Care Delivery During Crises



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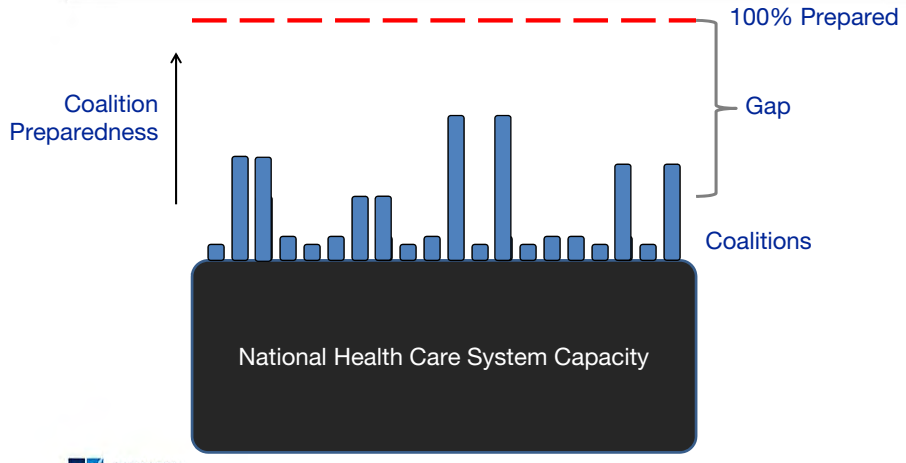
Health Care Delivery During Crises



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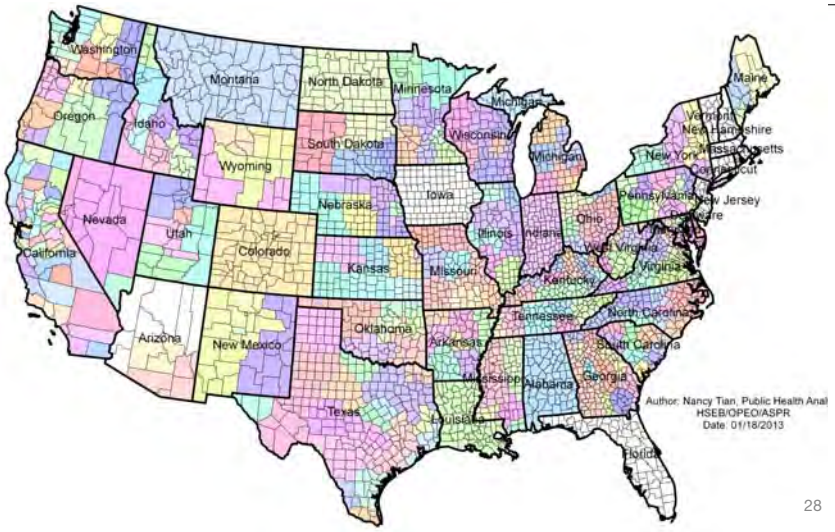
Geographic Dispersion of HPP Health Care Coalitions



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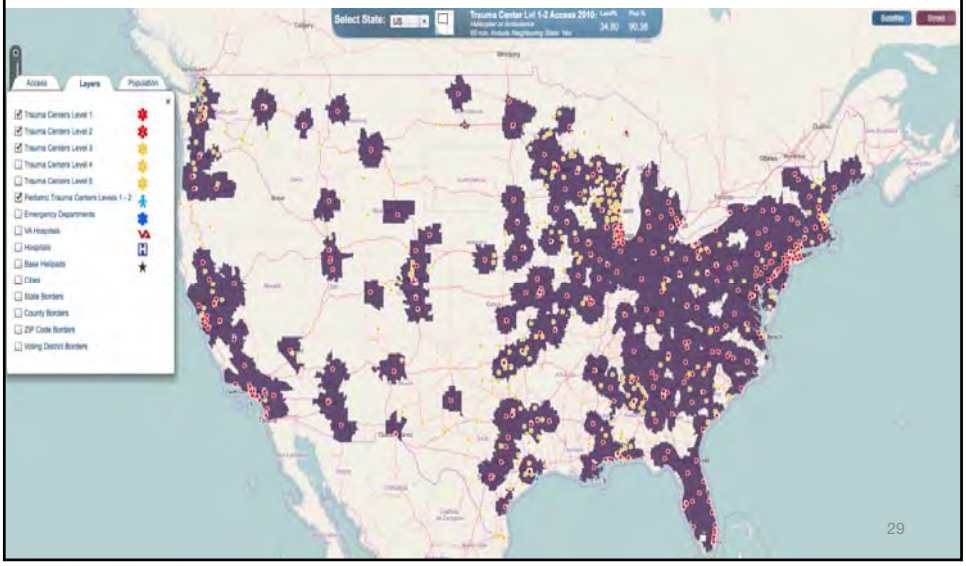
U.S. Trauma Systems



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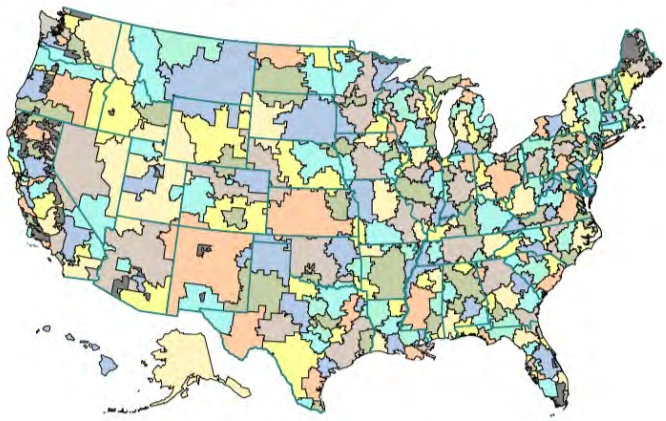
Hospital Referral Regions

Map A. The Dartmouth Atlas hospital referral regions



Conclusion Appendix B: About the *U.S. News* Best Hospitals for Clinical Excellence

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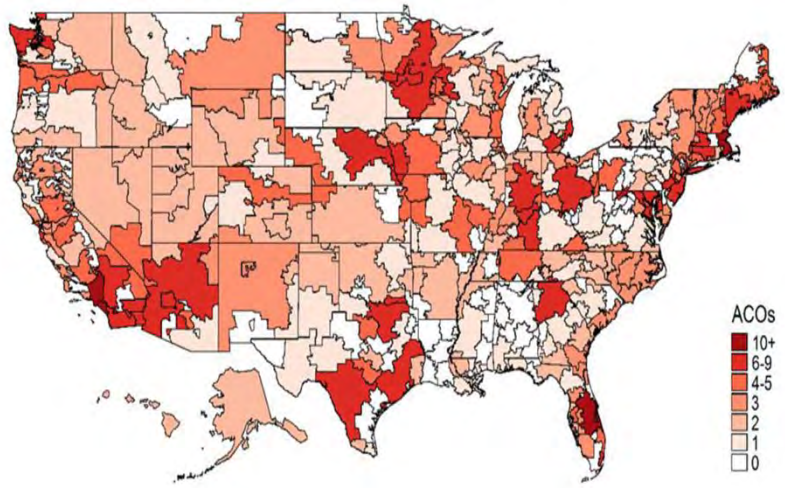
ACOs by Hospital Referral Region



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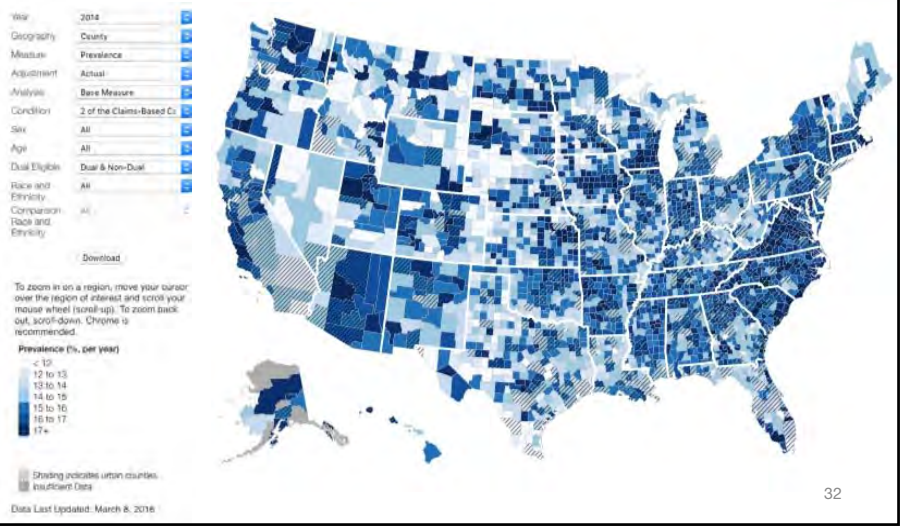
Health Disparities



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"Every system is perfectly designed to get the results it gets."

— Paul Batalden, MD

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Our Current Need

- **Vision**: A comprehensive 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

- A population-based health delivery model for disaster response

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Solutions

Tools for change

- Leadership, policy and data
- Appropriate measures
- Align incentives

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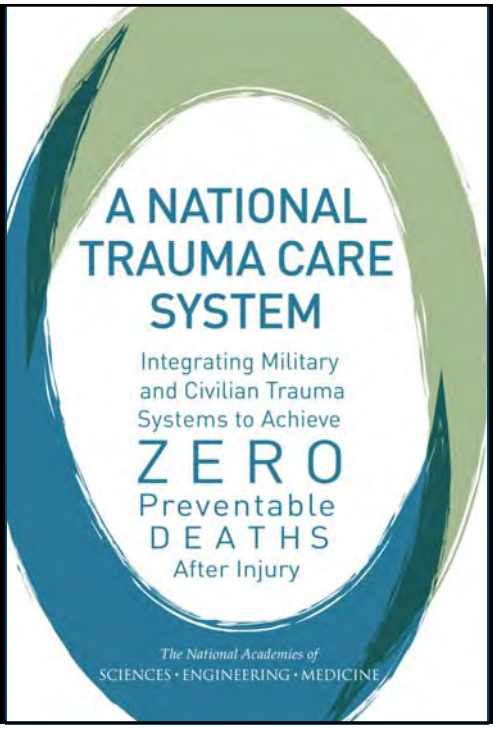
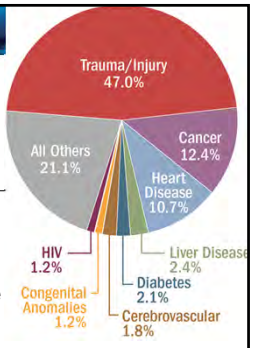


Study Sponsors

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

Context

- 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.



Traumatic injury accounts for nearly half of all deaths for Americans under 46 years of age and cost the nation $670B in 2013.

Context (cont.)

- 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.

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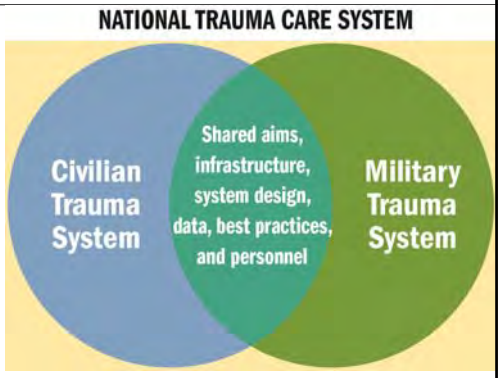
The Vision: A National Trauma Care System

A national strategy and joint military-civilian approach for improving trauma care is lacking. **A unified effort is needed** to ensure the delivery of optimal trauma care **to save the lives of Americans** injured within the U.S. and on the battlefield.

A national learning trauma care system would **ensure continuous improvement of trauma care best practices** in military and civilian sectors.



"Military and civilian trauma care will be optimized together, or not at all."

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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)

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Maintaining Health Care and Outcomes in Disasters

Continuity of Health Care Operations

Health care 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.

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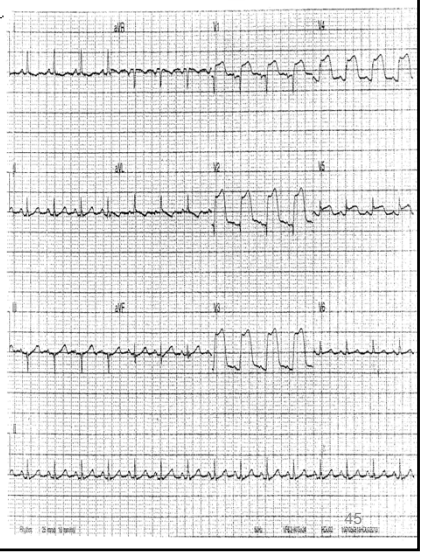
Time is Muscle — Door to Balloon Time

- 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



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Immediate Bed Availability (IBA)

- The ability of a health care system to provide no less than 20% bed availability of staffed members' beds within four hours of a disaster.

- It is built on three pillars:
  - Continuous monitoring across the health system
  - Off-loading of patients who are at low risk for untoward events through reverse triage
  - On-loading of patients from the disaster

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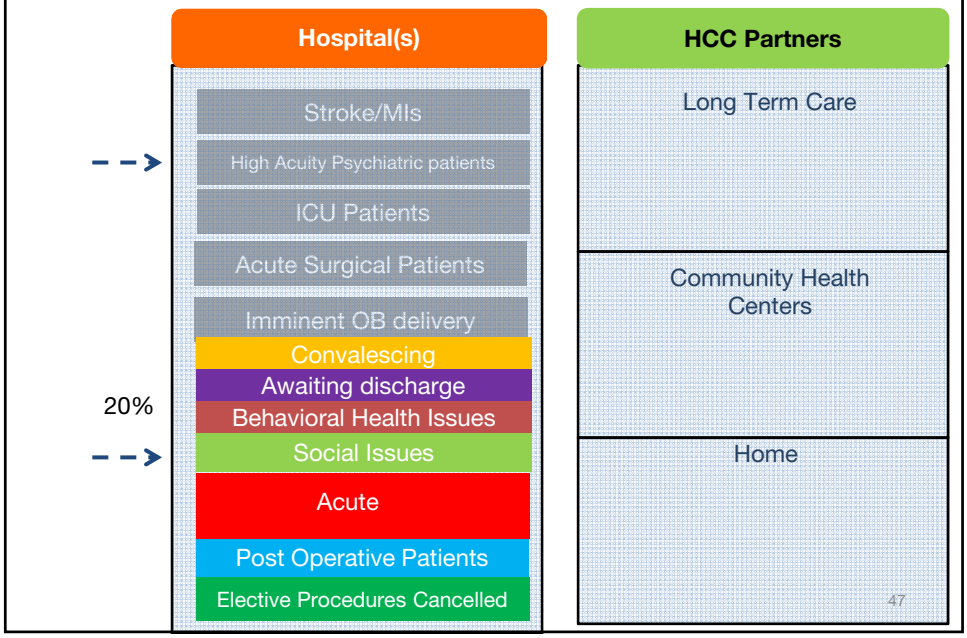
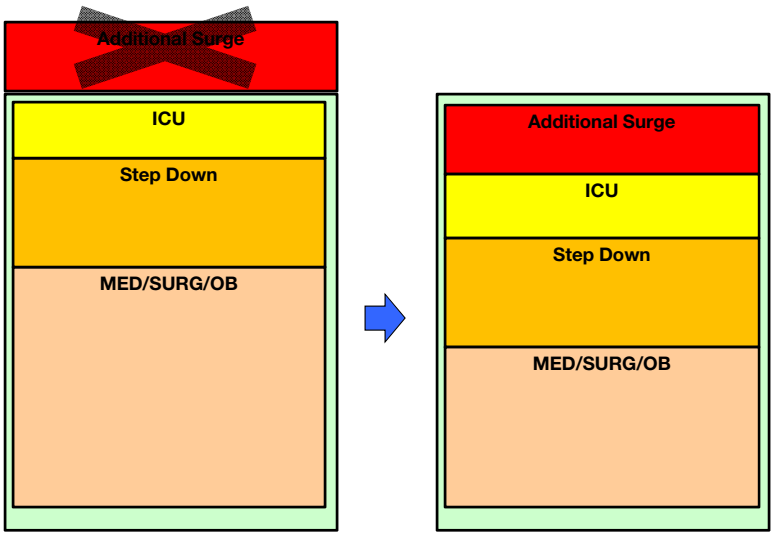
Immediate Bed Availability



Immediate Bed Availability: Making Room Within the System



Institute of Medicine (IOM) Crisis Standards of Care

Incident demand/resource imbalance increases →
Risk of morbidity/mortality to patient increases →
← Recovery

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

Coalition Building

IBA

Normal operating conditions

Extreme operating conditions

Indicator: potential for crisis standards[b]

Trigger: crisis standards of care[c]

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Source: IOM Crisis Standards of Care Report

Madrid Bombing

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

- 1000 acute care beds/health care systems
- 20% IBA = 200 beds immediately avail/system
- 100 health care systems in the United States
- Madrid = 2,000 patients = 10 systems engaged
- Across the U.S., 20,000 beds available — immediately

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Health Affairs Blog

HOME TOPICS ARCHIVE SUBMIT

ASSOCIATED TOPICS: COSTS AND SPENDING, EQUITY AND DISPARITIES, HEALTH PROFESSIONALS, HOSPITALS, INSURANCE AND COVERAGE, MEDICARE, ORGANIZATION AND DELIVERY, POPULATION HEALTH, QUALITY

Health, Economics, And Preparedness: Considerations And Paths Forward

David Marcozzi and Benoit Stryckman

September 14, 2015

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Economics, Health and Disasters

- The economic and health impacts of disasters are significant.
- In 2015, the U.S. Congress appropriated $5.4 billion in emergency supplemental funding to respond to the Ebola outbreak domestically and internationally.
- At a local level, the economic impact of disasters is also devastating as illustrated by the decline in revenues of Texas Health Presbyterian Hospital after their response to the first U.S. Ebola patient.
- In this period of continued threats, health care delivery reform and fiscal austerity, disaster preparedness requires a clear value proposition that encourages the U.S. delivery system to invest in preparedness.

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The Value Proposition For Health Care Disaster Response

- To drive reform in the health care delivery system, payers are shifting to value-based, patient-centered care for defined populations.
- If investors (hospitals, providers, payers) knew that allocating funds for disaster preparedness would improve health and yield positive returns, they would be far more likely to resource efforts appropriately.

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Value in Readiness

Direct benefits:

- Direct benefits include improvements in patient or public health during a time of crisis. To calculate direct benefits, one could compare the reduction in mortality for a similar event among facilities or jurisdictions with varying levels of preparedness investments.
- Improved triage accuracy.
- Safer delivery of care.
- Decreased time to definitive medical or surgical treatment.

Indirect benefits:

- Indirect benefits of preparedness investments are those that are external to the public's health during disasters.
- Improved care coordination.
- Daily care delivery efficiencies.
- Community tax benefits.
- Decreased litigation risk exposure.
- The economic effect of positive versus negative publicity.

Model 1: Delivery System Reform

- Integrate community health resilience within current delivery system reform efforts.
- Weaving key indicators of preparedness into the nationally recognized measures of clinical quality within Medicare's shared savings program and its Merit-Based Incentive Payment System.
- In essence, providers would be incentivized to prepare for disasters by including critical preparedness indicators — such as immediate bed availability — in payment structures, thereby fostering a shared sense of responsibility for the community.

Model 1: Delivery System Reform (cont.)

- This model would improve the linkage between clinical medicine and public health, motivate regional planning for disasters and foster community resilience.
- Integrating measures of resilience with current delivery system reform efforts synergizes well with population health efforts, care coordination priorities and value-based payment models.

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Payment Taxonomy Framework

	Category 1: Fee for Service—No Link to Quality	Category 2: Fee for Service—Link to Quality	Category 3: Alternative Payment Models Built on Fee-for-Service Architecture	Category 4: Population-Based Payment
Description	Payments are based on volume of services and not linked to quality or efficiency	At least a portion of payments vary based on the quality or efficiency of health care delivery	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	Payment is not directly triggered by service delivery so volume is not linked to payment. Clinicians and organizations are paid and responsible for the care of a beneficiary for a long period (e.g. ≥1 yr)
Medicare FFS	• Limited in Medicare fee-for-service • Majority of Medicare payments now are linked to quality	• Hospital value-based purchasing • Physician Value-Based Modifier • Readmissions/Hospital Acquired Condition Reduction Program	• Accountable care organizations • Medical homes • Bundled payments • Comprehensive primary care initiative • Comprehensive ESRD • Medicare-Medicaid Financial Alignment Initiative Fee-For-Service Model	• Eligible Pioneer accountable care organizations in years 3-5

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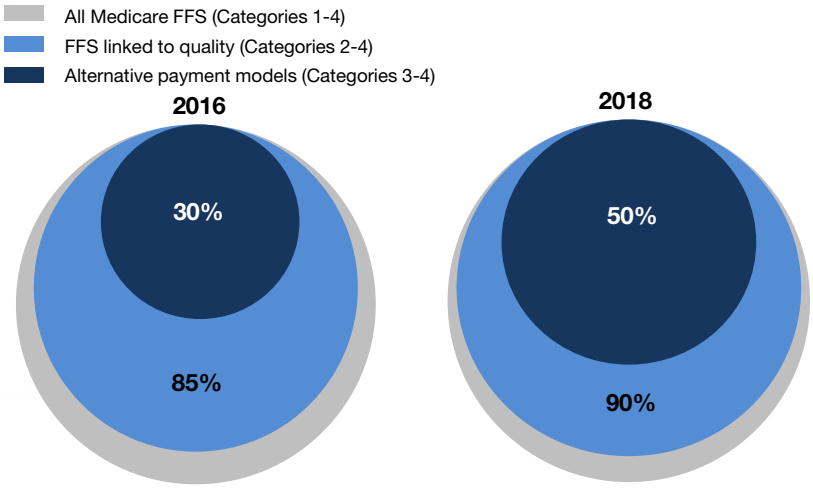
Target Percentage of Medicare FFS Payments Linked to Quality and Alternative Payment Models in 2016 and 2018



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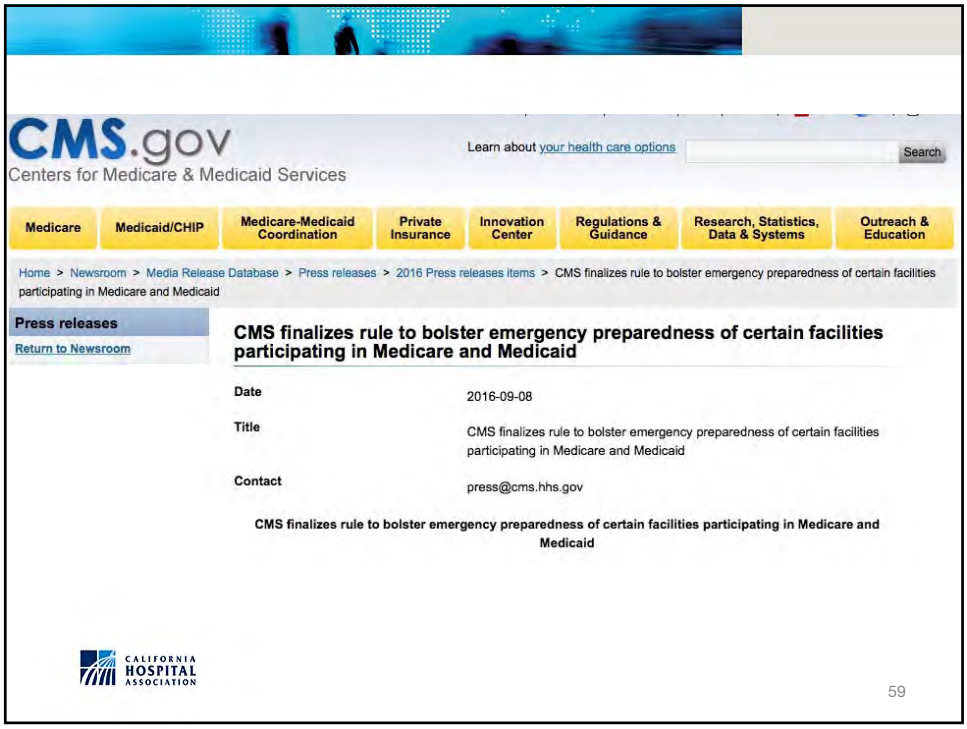

Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers

1. **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.
2. **Policies and procedures:** Develop and implement policies and procedures based on the plan and risk assessment.

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Emergency Preparedness Requirements for Medicare and Medicaid Participating Providers and Suppliers (cont.)

3. **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.
4. **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.

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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

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CMS Proposed Rule (cont.)

- 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 Biodefense Report (http://www.biodefensestudy.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.

CMS Proposed Rule (cont.)

- Today's health care system has limited inpatient 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 IOM's work on crisis standards of care (http://iom.nationalacademies.org/Reports/2012/Crisis-Standards-of-Care-A-Systems-Framework-for-Catastrophic-Disaster-Response.aspx). IBA builds and measures community resilience, weaving a thread of preparedness within our daily health care delivery construct. Grounded on operational, economic, academic and ethical tenants, IBA sets clear requirements for health care systems and/or hospital based APMs to care for victims of a mass casualty.
- IBA is defined as the ability of a health care system to make available, within four hours, up to 20% of staffed inpatient beds to higher acuity patients during a disaster.

CMS Proposed Rule (cont.)

- 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 inpatient census acuity and maintain disaster discharge plans for all admitted patients, 2) the ability to rapidly (within 4 hours) offload up to 20% of lower acuity inpatients from the hospital to other health care or home settings safely, 3) to be able to receive and care for higher acuity patients within the inpatient setting, and 4) to track and document patient movement.
- IBA was presented to the National Quality Forum (www.qualityforum.org/Projects/n-r/Regionalized_Emergency_Medical_Services/Draft_Report.aspx) and the IOM, 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 having the flexibility to maintain the same standard of care during a crisis."

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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.

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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 preparedness efforts.

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Summary (cont.)

- Aligning health care market incentives with preparedness efforts will improve investment strategies and lead to the more effective use of limited resources.
- Weaving health care preparedness principles into the nation's economy and health delivery system offers a new paradigm that supports the nation's security.
- 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.

Questions?

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Thank You!

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