Data Linkage, Integration, and Outcomes Measures

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American College of Surgeons
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The Committee on Trauma

NHTSA
National Highway Traffic Safety Administration

NIH

Why?

- Data illuminates the way

Recommendation 5

- The Secretary of Health and Human Services and the Secretary of Defense, together with their governmental, private, and academic partners, should work jointly to ensure that military and civilian trauma systems collect and share common data spanning the entire continuum of care. Within that integrated data network, measures related to prevention, mortality, disability, mental health, patient experience, and other intermediate and final clinical and cost outcomes should be made readily accessible and useful to all relevant providers and agencies

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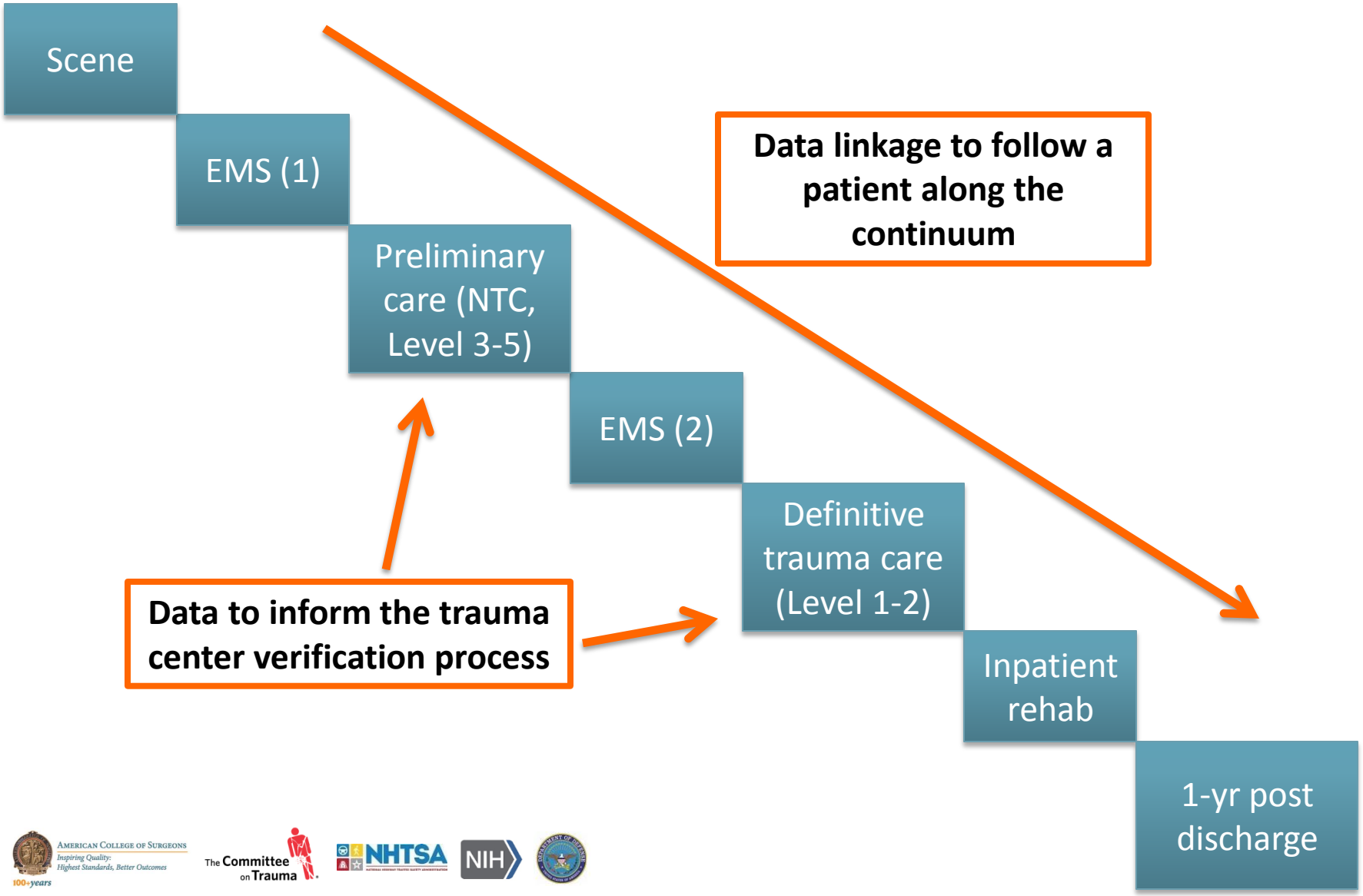
Trauma Continuum



Field-EMS-Trauma Center-Rehab

Current State

- EMS minimal dataset (NEMSIS)
- National Trauma Data Standard
- Uniform Data System for medical rehabilitation (UDSmr)
- Data are siloed
  - EMS ⇸ hospital
  - Non-trauma center ⇸ trauma center
  - Trauma center ⇸ rehab
- Feedback/learning is rare & system dependent
- Data does not allow for learning- provider level, system level
- Care is static

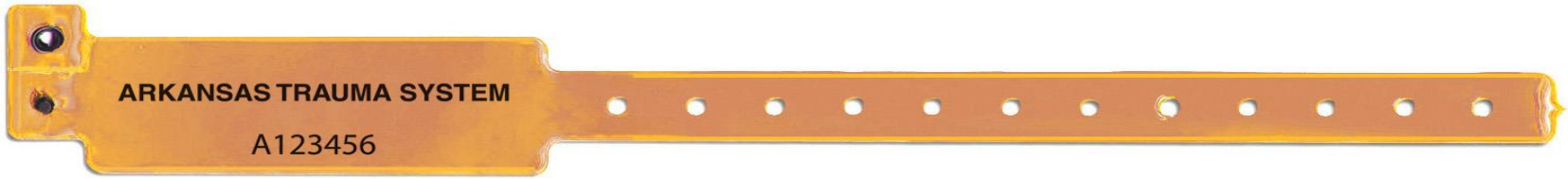
Future State

- Bidirectional data flow
  - EMS data flows into hospital EMR/registry
  - Trauma center data flows to EMS agencies
  - Trauma center data flows to rehab and rehab to trauma center
- Feedback to provider/agency – learning possible
- Care evolves

Controversy 1 – Uniform Trauma ID bands

- Pro: Michael Sutherland, MD, FACS “What’s the problem?”
- Con: Patrick Reilly, MD, FACS “What, are you crazy?”

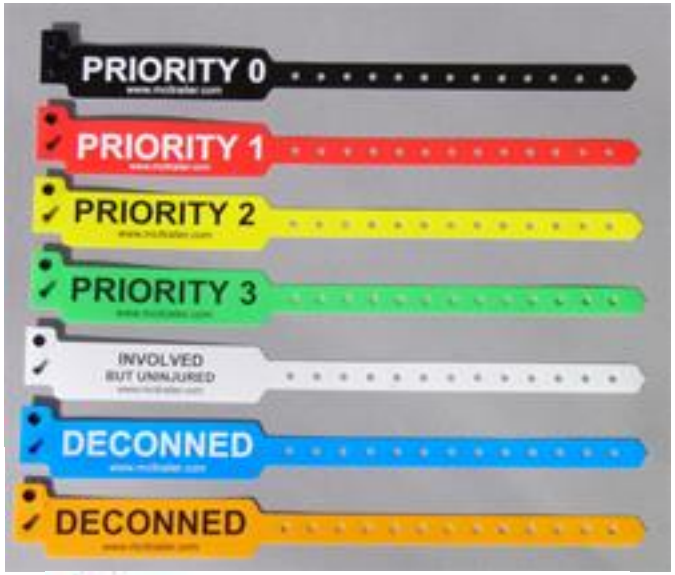
Uniform Trauma ID Bands
What are they?



- Alpha-numeric code on each band supplied to all hospitals and pre-hospital providers
- Durable vinyl material and brightly colored
- Left in place through discharge & ID# documented in EMS, hospital registries –UNIQUE IDENTIFIER across continuum
- Applied to all patients meeting pre-specified criteria
  - “Go wide” to avoid missing patients

This seems complicated….

- We use arm bands all the time
- Familiar process
- Short learning curve
- Mandatory field in the registries



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Benefits

- Unique identifier from field to rehab
  - EMS, transferring center, trauma center, rehab
- Improved PI, feedback, can link performance/care to outcomes
- Enables research across the continuum
- Cheap (4 cents/band), easy to implement
- Leverages the data already collected to allow for analysis of the full spectrum of care.

Disadvantages

- Risk to privacy – data breach allows for exposure to greater amount of data
- Too much irrelevant data - Michigan Pilot 2015 – 1409 Bands Placed
  - 429 Trauma Incidents
  - 3 Transfer Patients
- Non-trauma centers don't have registries and challenging to incorporate into EMR, admin data
- Data sharing agreements, oversight, cost of data management
- Can be accomplished without a trauma band ("a 90% solution")
  - Stroke Care – Acad Em Med 2010
  - Trauma Care – BMC Med Inform Decis Mak 2008
- Is the goal to impact patient Care or ensure complete data?

Controversy 2 – Outcome based verification

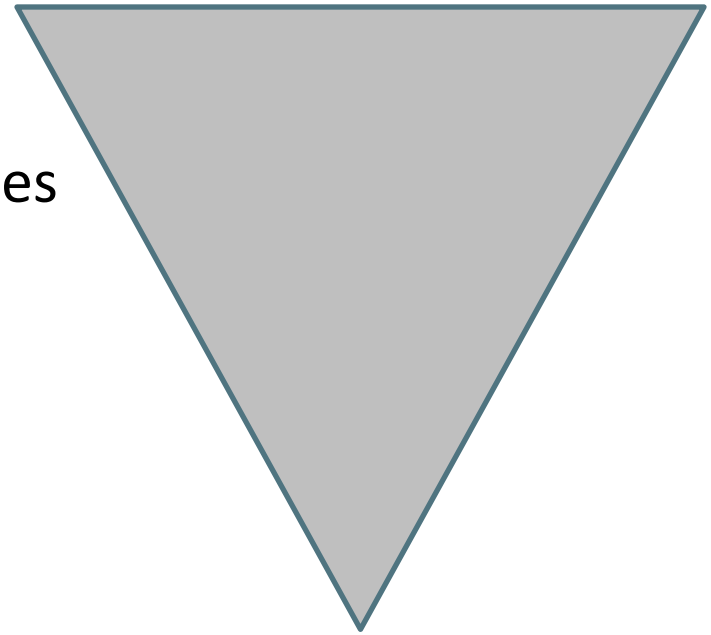
- How should data inform the verification process?
  - Pro – Michael Chang, MD, FACS – Verification should only be based on outcome data
  - Con – Jorie Klein, BSN, RN – Verification SHOULD NOT only be based on outcomes

AVEDIS DONABEDIAN
Professor, Public health
University of Michigan

Measurement of Quality

Structure

- Staff, physical resources, policies



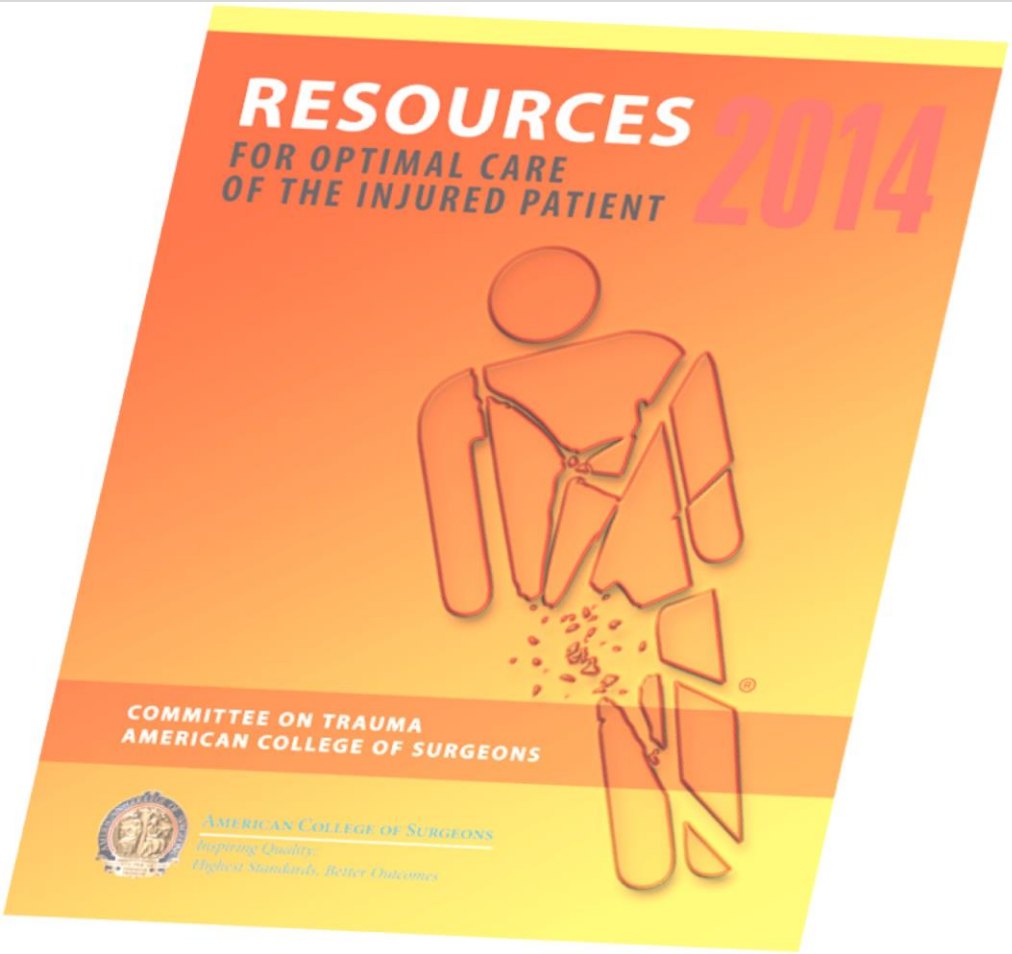
Process

- Was medicine properly practiced?

Outcome

- Modifiable

Quality defined by structures & processes



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Outcomes? What Outcomes?

Structure-Process-Outcome Relationships

	Structure-Outcome (n=208)	Structure-Process (n=53)	Process-Outcome (n=56)
Positive	72 (34%)	32 (60%)	36 (64%)
Negative	42 (20%)	7 (13%)	5 (9%)
Nonsignificant	94 (45%)	14 (26%)	15 (26%)

Hearld, Medical Care Research & Review, 2008

Outcomes driven verification - Pro

- Structure and process emphasized in time when outcomes not available
- Assumptions
  - One size fits all
  - Appropriate structure and function would lead to good outcomes
- Verification based upon structure and process
  - Time consuming, expensive, subjective

Outcomes-Driven Verification-Pro

- Value-based purchasing, pay for performance
  - Drives Innovation
  - Minimizes variability
  - Focus on data quality
  - Performance Improvement goes from being a *requirement* to a ***necessity***
- Allows trauma centers to optimize structures and process according to center strengths
- Outcomes drive innovation
  - NSQIP example – ERAS, Colon bundles
  - Tourniquet, REBOA, 1:1:1 resuscitation

Metrics – Trauma Center

- Outcomes
  - Modifiable/desirable
  - Measurable – major cost, small sample size
- Major gaps in using metrics that address patient centered care or minimizing disability
  - Patient centered care
    - Patient navigation, end of life care, family/patient support network
  - Minimizing disability
    - Screening for mental health conditions (ASD, PTSD, depression, anxiety)
    - Functional status at discharge
    - 1 year functional outcome/QoL

Outcomes driven verification - Con


Outcomes
Verified Trauma Center
System Integration
PIPS
Volume
Nursing
Outreach
Prehospital
TMD
Blood Bank
TPM
Transfer Process
Culture
NTDB
Surgical Commitment
Advocacy
Board Resolution
TQIP
Education
OR
Resources
Peer Review
Medical Staff
Psych Support
Injury Prevention
Critical Care
Trauma
Radiology
Organizational Leadership & Commitment
Registry
Anesthesiology
Emergency Medicine
Diagnostics
Neurosurgery
Trauma Protocols
Orthopedics
Research
Evidence-Based Practice
Lab
Feedback
Rehabilitation
FUNDING
Disaster Response

Where do you start??

How do you build it without criteria?

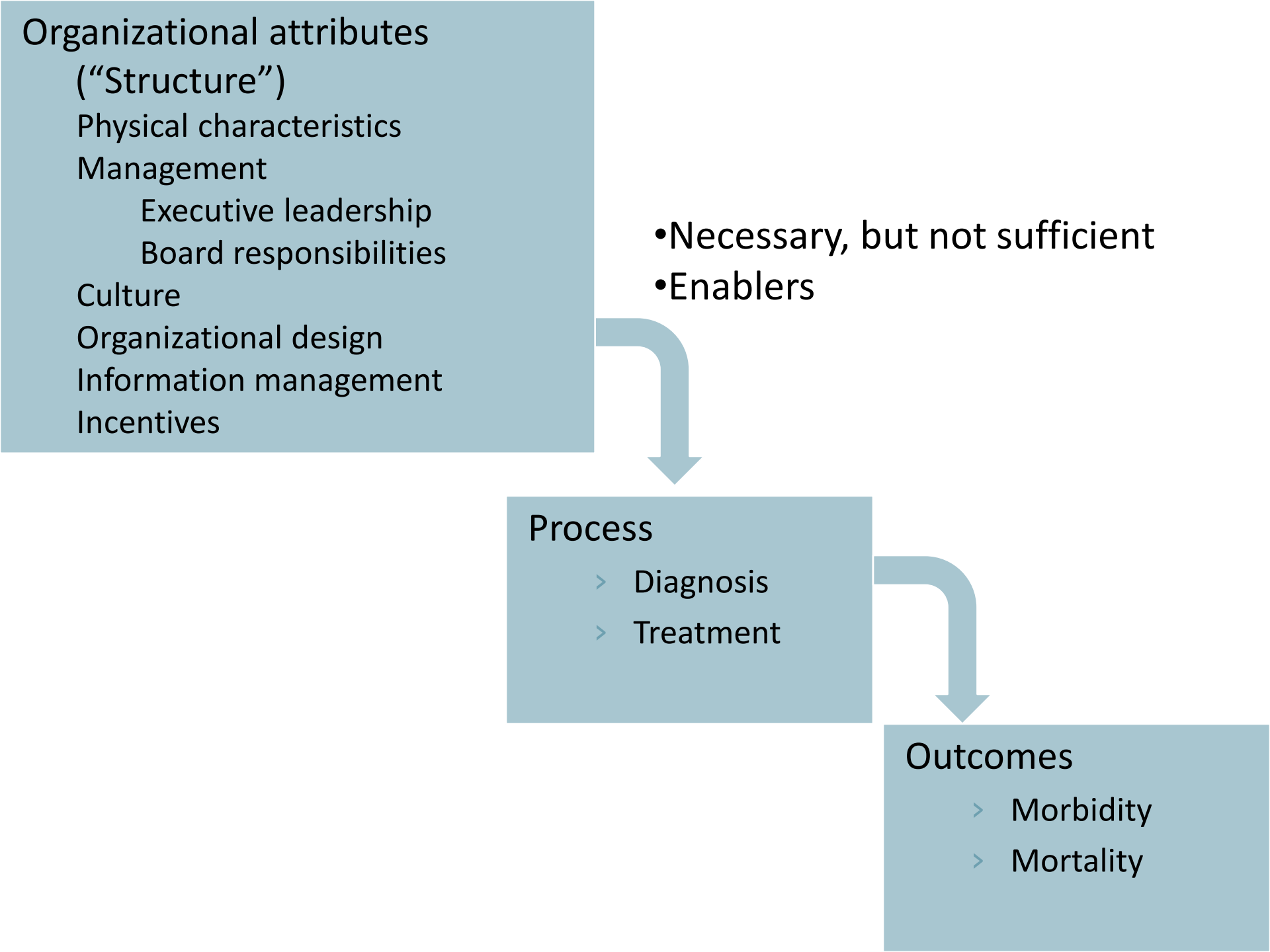
Building upon the Verification Process

- What makes a trauma center – what's the "special sauce"?
  - Concurrent PIPS
  - Concurrent Registry
  - Leadership
  - Commitment
  - Engaged Team
- How can we improve the verification process?
  - Limit redundancy
    - Crosswalk between CMS, Joint Commision/ACS
  - Pre-Review of TQIP Reports
  - Identify & disseminate innovation

Structure =commitment

- Organizational theory
  - People (management and employees) and organizational arrangements are key determinants of performance and quality
- Essential structural elements are the catalysts for process change
  - Leadership, human capital, information management systems, and group dynamics (culture, incentive systems)
- Juran “management commitment is pertinent to every successful quality revolution, no exceptions are known”

Glickman, Int J Qual Health Care, 2007


Organizational attributes
("Structure")
Physical characteristics
Management
Executive leadership
Board responsibilities
Culture
Organizational design
Information management
Incentives
•Necessary, but not sufficient
•Enablers
Process
Diagnosis
Treatment
Outcomes
Morbidity
Mortality

Questions