The JCAHO Taxonomy: Concepts & Structure for PI Management
R. Lawrence Reed, II, MD, FACS, FCCM
Physician Advisor, Revenue Cycle Services, IU Health
Acute Care Surgery, IU Health Methodist
Professor of Surgery, Indiana University

Trauma Performance Improvement
- Trauma verification by ACSCOT & state designation agencies expect robust performance improvement activities
  - Case reviews to determine if deaths are
    - Preventable
    - Potentially preventable
    - Non-preventable
  - Process improvement activities occasionally undertaken to prevent future similar mishaps
    - This activity often seemed to take a back seat to that of preventability determinations

Challenges to Traditional Trauma Peer Review Process
- In most states, deliberations and decisions of medical peer review committees are protected from discovery
  - Promotes honesty and openness by physicians in evaluating medical & surgical management issues
- However, over the past 15 years, plaintiff and defense attorneys have sought and have been provided access to traditionally protected documents
- Some states have made minutes of Trauma Peer Review Committee deliberations discoverable
  - Passed in 2004, Florida's Amendment 7 states that patients can have access to peer review minutes
Re-thinking the Trauma PI Process

- Problematic Issue: determination of “preventable” or “potentially preventable” deaths
  - Establishes potential liability for physicians and in certain jurisdictions
  - Future legal attacks on professional peer review in medicine should be considered likely
- Initial solution: ACS COT replaced “preventable”, “potentially preventable”, or “non-preventable” with other terms:
  - Old nomenclature: Nonpreventable death
    - New nomenclature: Anticipated mortality without opportunity for improvement
  - Old nomenclature: Potentially preventable death
    - New nomenclature: Anticipated mortality with opportunity for improvement
  - Old nomenclature: Preventable death
    - New nomenclature: Unanticipated mortality

“Anticipated” & “Unanticipated”

- “Anticipated” death concept seen as useful for identifying DNR & withdrawal of support issues
  - DNR/withdrawal should be selectable items in the taxonomy
- All deaths are anticipated
  - It’s just a matter of timing
- “Unanticipated” deaths: 2 potential meanings:
  - Patient was considered immortal
  - Something went wrong
  - May still have problems with discoverability states
- Anticipation or preventability are unnecessary designations & do not help the PI process
  - All lives start out with the understanding that death is not anticipated for a long time
  - If death becomes anticipated, something changed to alter the understanding
  - Medicine’s inherent premise is that all deaths are preventable
    - If death becomes unpreventable, something changed to alter our opinion

The New Paradigm for Trauma PI Efforts

- Death and other complications are considered Sentinel Events
  - These should be the triggers for case reviews
- Opportunities for improvement should always be sought and identified
  - No assignment of judgment regarding preventability or anticipation is necessary
  - OFIs can best be identified by evaluating all aspects of the process of care to determine areas that, if they had worked differently, could have avoided the development of the Sentinel Event
A New Paradigm for Patient Safety: The International Classification for Patient Safety (ICPS)

- 2002: World Health Assembly Resolution WHA55.18.
  “The Fifty-fifth World Health Assembly...REQUESTS the Director-General in the context of a quality programme: (1) to develop global norms, standards and guidelines for quality of care and patient safety, the definition, measurement and reporting of adverse events and near misses in health care by reviewing experiences from existing programmes and seeking inputs from Member States, to provide support in developing reporting systems, taking preventive action, and implementing measures to reduce risks...”
- 2003: WHO contracts with The Joint Commission to explore the state of patient safety taxonomies, classifications, and terminologies

Development of JCAHO Taxonomy

- Problem:
  - There is no commonly agreed-upon definition for errors in health care
  - There is currently no universal agreement on medical error taxonomy
  - There is currently no single classification system that could be applied to the full set of IOM recommendations
- Established a Patient Safety Taxonomy Workgroup
- Performed a comprehensive review of existing literature for terminology and definitions used in patient safety
  - 527 unique references
  - Compared the classifications of medical and medication errors, patient safety events, & incident reporting systems for homogeneity

Shared Words for Medical Error and Patient Harm

- Adverse event/outcome
- Unintended consequence
- Unplanned clinical occurrence
- Therapeutic misadventure
- Peri-therapeutic accident
- Iatrogenic complication/injury
- Hospital-acquired complication
- Medical mishap
- Unexpected occurrence
- Unoward incident
- Bad call
- Sentinel event
- Failure
- Mistake
- Lapse
- Slip
Sentinel Event

- An unexpected occurrence involving death, serious physical or psychological injury, or risk thereof. Serious injury specifically includes loss of limb or function. The phrase "or the risk thereof" includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome.

Reviewable Sentinel Events

The subset of sentinel events that is subject to review by the Joint Commission includes any occurrence that meets any of the following criteria:

- The event has resulted in an unanticipated death or major permanent loss of function, not related to the natural course of the patient’s illness or underlying condition; or
- The event is one of the following (even if the outcome was not death or major permanent loss of function):
  1. Suicide of a patient in a setting where the patient receives around-the-clock care (for example, hospital, residential treatment center, crisis stabilization center);
  2. Infant abduction or discharge to the wrong family;
  3. Rape;
  4. Hemolytic transfusion reaction involving administration of blood or blood products having major blood group incompatibilities; and
  5. Surgery on the wrong patient or wrong body part.

Joint Commission on Accreditation of Healthcare Organizations

JCAHO Taxonomy

- Building blocks
  - Common definitions and classifications
  - Unambiguous and translatable terminology
- Scope
  - Comprehensive classification tool
  - Applicable to all health care delivery settings
  - Includes all patient harm
  - Addresses sentinel or serious events, adverse events, no-harm events, near misses or close calls, and potential events
Primary Classifications in JCAHO Taxonomy

1. **Impact**: the outcomes or effects of medical error and systems failure, commonly referred to as harm to the patient.
2. **Type**: the implied or visible processes that were faulty or failed.
3. **Domain**: the characteristics of the setting in which an incident occurred and the type of individuals involved.
4. **Cause**: the factors and agents that led to an incident.
5. **Prevention and Mitigation**: the measures taken or proposed to reduce the incidence and effects of adverse occurrences.

JCAHO Taxonomy Implementation by ACS COT PIPS Subcommittee

- Sentinel events act as triggers for case review:
  - Deaths
  - Other non-discretionary events (i.e., specific complications [i.e., NTDS complications])
  - Discretionary events
- Develop computerized application to enhance ease of use
  - Import NTDS complications as baseline sentinel events
  - Allow users to add additional sentinel event types
- Classify the relevant factors for the event using the JCAHO taxonomy
  - Configured for trauma care (“Traumafication”)
  - Enable peer review while minimizing discoverability concerns
  - Elimination of terminology that assigns blame or judgment
    - “preventable”
    - “possibly preventable”
    - “unanticipated”
    - “caused”
“Traumafication” of the Taxonomy

- Configured for trauma care
  - Input from Parkland in Dallas (Jorie Klein & Dr. Joe Minei)
  - Software partner: Digital Innovations
  - Input from Mayo in Rochester (Carol Immerman & Dr. Don Jenkins)
  - Software partner: TraumaBase
- Traumafication elements
  - Definitions of mild, moderate, & severe harm
  - Definitions of temporary and permanent harm
  - Definitions of missed injuries and delayed diagnoses
  - “Other” applied to all picklists for conditions not specifically defined
  - Added trauma-related items to several picklists
“Traumafication” of the Taxonomy

- Enable peer review while minimizing discoverability concerns
- Elimination of terminology that assigns blame or judgment
  - “Cause”: 4th Primary Classification in original JCAHO report
  - This changed to “Factors” for Trauma Taxonomy:
    - System Factors
    - Human Factors
  - “preventable” eliminated
  - “possibly preventable” eliminated
  - “unanticipated” eliminated

Traumafication Picklist Edits

- Impact → Non-Medical → Economic
  - Prolonged hospital stay
  - Unnecessary hospital admission
  - Unnecessary EMS ground transport
  - Unnecessary EMS aeromedical Transport
  - Unnecessary transfer
  - Unnecessary procedure or care
  - Access to rehabilitation care
  - Loss of property
  - Difficult placement
  - Other _____________________

- Type → Clinical Performance → Pre-Intervention
  - Correct Diagnosis Questionable Procedure
  - Inaccurate Diagnosis
  - Incomplete Diagnosis
  - Questionable Diagnosis
  - Missed injury
  - Delayed diagnosis
  - Delayed transfer
  - Decision making prior to arrival
  - Patient refused care
  - Other _____________________
Traumafication Picklist Edits

- Type → Clinical Performance → Post-Intervention
  - Correct Prognosis
  - Unexpected Outcome
  - Inadequate post-procedure/discharge instructions
  - Inadequate discharge planning
  - Other

Traumafication Picklist Edits

- Domain → Setting
  - Scene
  - Ground Transport
  - Air Transport
  - Transferring Facility
  - Emergency Department
  - Trauma Resuscitation Bay
  - Radiology
  - Interventional Radiology
  - Operating Room
  - Post Anesthesia Care Unit
  - Intensive Care Unit
  - Step Down Unit
  - Floor
  - Outpatient (Clinic)
  - Other

Traumafication Picklist Edits

- Domain → Phase
  - Evaluation
  - Resuscitation
  - Acute Care
  - Post Discharge
  - Other
Traumafication Picklist Edits

- **Domain → Time**
  - Weekday
  - Weekend/Holiday
  - Day
  - Night
  - Shift Change
  - Other _______________________

Traumafication Picklist Edits

- **Domain → Staff → Providers**
  - Trauma Surgeon
  - Fellow
  - Resident
  - Physician's Assistant (PA)/Nurse Practitioner (NP)
  - Emergency Medicine (EM) Physician
  - Intensivist
  - Neurosurgeon
  - Orthopedic Surgeon
  - Anesthesiologist
  - Radiologist
  - Oral maxillofacial surgeon (OMFS)
  - Plastic Surgeon
  - Ophthalmologist
  - Physiatrist
  - Referring Physician
  - Other _______________________

Traumafication Picklist Edits

- **Domain → Staff → Nurses**
  - Registered Nurse
  - Licensed Practical Nurse (LPN)
  - Nursing Assistant
  - Float Staff
  - Other _______________________

---
Traumafication Picklist Edits

- **Domain → Staff → Therapists**
  - Physical Therapist
  - Occupational Therapist
  - Respiratory Therapist
  - Speech Therapist
  - Prosthetist
  - Orthotist
  - Other _________________________

- **Domain → Staff → Other Disciplines**
  - Pharmacist
  - Radiology Technician
  - Laboratory Technician
  - Catheterization Team
  - Blood Bank/Perfusion Technologist
  - Emergency Medical Service Providers
  - Other _________________________

- **Factors → System Factors**
  - Electronic Medical Record
  - Registration
  - Schedules
  - Resource Availability
  - Equipment
  - Personnel
  - Other
  - Hand-off process
  - Multiple Casualty Incident
  - Inadequate or absent Policy or Patient Management Guideline
  - Diversion
  - Referral Process
    - Incorrect service or consultation
    - Incorrect transfer team
    - Surgeon not available to speak with referring physician
  - Trauma Team Activation
    - Short notification
    - Page confusing
    - Incomplete page
    - Other
  - Other _________________________
**Traumafication Picklist Edits**

**Factors → Patient Factors** (Failures related to patient characteristics or actions that are beyond the control of the practitioner)
- Arrived with no signs of life
- Arrived with signs of life
- Resuscitation attempts failed
- Advanced Directive in place
- Family withdrew care
- Event due to consequences of injury
- Palliative care admission
- Uncooperative/Non-compliant
- Left against medical advice
- Left without being seen
- Left before treatment completed
- Other ______________________________________

**Factors → Social Factors**
- Family issues
- Suicidal
- Family related needs
- Translator needs
- Difficult placement
- Homeless
- Behavioral issues
- Satisfaction with care
- History of interpersonal violence in home
- Other ______________________________

**Factors → Economic Factors**
- Prolonged length of stay/delayed disposition
- Unnecessary hospital admission
- Unnecessary Emergency Medical Services ground or air transport
- Unnecessary procedure
- Unnecessary treatment
- Other ______________________________
Traumafication Picklist Edits

- **Prevention & Mitigation**
  - **Determination**
    - Event with Opportunity for Improvement
    - Event without Opportunity for Improvement
    - No Error
    - Other

- **Action Plan**
  - Periodic Report
  - Develop Practice Management Guideline or Policy
  - Education
  - Peer Review Committee
  - Strategic Plan
  - Refer for Hospital or System Performance Improvement Review
  - Counseling
  - Ongoing Professional Practice Evaluation (OPPE)
  - Change in Privileges
  - Other

Ishikawa Diagram

- Created by Kaoru Ishikawa (1968)
- AKA:
  - fishbone diagrams
  - herringbone diagrams
  - cause-and-effect diagrams
  - Fishbone
- Causal diagrams show the causes of a specific event
- Common uses:
  - product design
  - quality defect prevention
  - identify potential factors causing an adverse effect
- Each cause or reason for imperfection is a source of variation.
- Causes are usually grouped into major categories to identify these sources of variation

Fishbone Diagram Using Taxonomy

[Diagram showing a fishbone diagram using taxonomy]
Example Case

- 24 y/o male MVC victim transferred at family’s request from Level II TC in evening 10 hours following incident
- Had been hypotensive initially, but received 5 units PRBCs and 6 L crystalloid in first 12 hours and becomes stable prior to transfer
- Arrives intubated with pulmonary contusions, rib fractures, open tib/fib fracture, GCS 8, moving all 4 extremities
- Secondary survey & adjunctive studies o/w negative except for suspicion of lower T-spine fracture on CT

Example Case

- Ortho consulted for open tib/fib fracture management
  - Requests neuro clearance
- Neuro recommends MRI to further evaluate T-spine
- Goes for MRI at 2 am
- While in scanner, nurse notes patient to be cyanotic despite good rhythm seen on monitor in MRI
- Patient pulled out of scanner and found to be asystolic on regular monitor
- CPR instituted, patient resuscitated but with severe anoxic brain damage
- Support withdrawn 5 days later
- Further review indicated patient had severe base deficit on arrival and collapsed inferior vena cava

Experience with JCAHO Taxonomy

- In 2006, National Quality Forum (NQF) endorsed JCAHO taxonomy from 11 candidate comprehensive patient safety taxonomies
- Growing library of citing manuscripts
- Three publications in trauma literature
Patterns of Errors Contributing to Trauma Mortality: Lessons Learned From 2594 Deaths

- Reviewed 2,594 deaths (5.8%) in 44,401 trauma patient admissions from 1996-2004
  - Contributing errors identified in 64 patients (0.14% of admissions, 2.5% of deaths)
- Important error patterns included:
  - Delayed hemorrhage control (25%)
  - Airway issues (16%)
  - Management of unstable patients (14%)
  - Procedural complications (13%)
  - Inadequate prophylaxis (11%)
  - Missed or delayed diagnoses (11%)
- Subsequent data-directed institutional & regional trauma system policy changes demonstrably reduced the incidence of error-related deaths.

Patient Safety in Trauma: Maximal Impact Management Errors at a Level I Trauma Center

- 19,037 trauma admissions from 2001-2006
- 764 deaths identified with management errors contributing to:
  - 60 potentially preventable deaths (errors in management might have contributed to death)
  - 16 preventable deaths (management errors definitely contributed to death)

Classifying errors in preventable & potentially preventable trauma deaths: a 9-year review using the JC’s standardized methodology (Vioque: Am J Surg 2014)

- All preventable/potentially preventable deaths identified at an urban, level-1 trauma center (January 2002 to December 2010) were abstracted from the trauma registry.
- Errors deemed avoidable were classified within the 5-node (impact, type, domain, cause, and prevention) Joint Commission taxonomy.
- Of the 377 deaths in 11,100 trauma contacts, 106 (7.7%) were preventable/potentially preventable deaths related to 142 avoidable errors.
- Most common error types were in clinical performance (inaccurate diagnosis).
- Error domain involved primarily the emergency department (therapeutic interventions), caused mostly by knowledge deficits.
- Communication improvement was the most common mitigation strategy.
Event Resolution with TJC Taxonomy

<table>
<thead>
<tr>
<th>TJC Taxonomy</th>
<th>Event Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact: the outcomes or effects of medical error and systems failure, commonly referred to as harm to the patient.</td>
<td>Injured patient(s)</td>
</tr>
<tr>
<td>Type: the implied or visible processes that were faulty or failed.</td>
<td>Faulty processes removed / corrected</td>
</tr>
<tr>
<td>Domain: the characteristics of the setting in which an incident occurred and the type of individuals involved.</td>
<td>Area / setting contributing characteristics identified</td>
</tr>
<tr>
<td>Cause: the factors and agents that led to an incident.</td>
<td>Negative factors removed or corrected</td>
</tr>
<tr>
<td>Prevention and Mitigation: the measures taken or proposed to reduce the incidence and effects of adverse occurrences.</td>
<td>Adverse events reduced or eliminated</td>
</tr>
</tbody>
</table>

Current Status COT PIPS
Implementation of JCAHO Taxonomy

- Develop specific elements within taxonomy specific to trauma
- Create data entry software with look-up capabilities for classification
- Distribute
- Debug
- Pilot application of JCAHO-COT taxonomy at a limited number of trauma centers that will classify event information concurrently with standard registry/PI data entry and evaluation
- “Traumafication”
- Develop educational and integrating materials
  - TOPIC
  - PIP
  - NTDS
  - VRC
  - TQIP
- Assess effectiveness

Summary

- The “Traumafied” Taxonomy provides a useful tool for Root Cause Analysis (RCA)
  - Operationalization of Ishikawa diagram
- Effectiveness facilitated by
  - Integration with trauma registry software
  - Ease of data entry
  - Automated reports to identify areas in need of performance improvement activities
- Enables Continuous Quality Improvement