The Patient Core Curriculum
and Introduction to the
Lewis Blackman Story

Paul Barach, MD, MPH
Human Error and performance limitations
Establish near miss voluntary reporting systems and protect from discovery
Creating Safety systems in health care organizations
Errors lead as major cause of death, injury
Create a safety culture
Create and inculcate a safety curriculum
Team training and simulation
Establish national safety authority
Anesthesiology—only clinical domain to make patient safety central to its mission
Altman, et al. 2004---five years later---IOM most important report in 2 decades
Wachter, 2006---C+ grade on report card
# THE PATIENT SAFETY CORE CURRICULUM

<table>
<thead>
<tr>
<th>Patient Safety Domains</th>
<th>Knowledge, Skills, Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Theoretical Foundations</td>
<td>Microsystems, historical trends, chaos, complexity, competency and learning</td>
</tr>
<tr>
<td>2. Behavioral Aspects of Medical    Professionalism</td>
<td>Ethics, patient quality of life, resolution of conflict</td>
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<tr>
<td>3. Interpersonal Issues</td>
<td>Communication, stress and coping</td>
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<tr>
<td>4. Human Factors and Ergonomics</td>
<td>Design history, error taxonomies, safety tools, decision support systems, fatigue factors, user centered design</td>
</tr>
<tr>
<td>5. Systems Analysis</td>
<td>Usability criteria, organizations and learning disasters, place for human error</td>
</tr>
<tr>
<td>6. QI Learning</td>
<td>Pareto/flow charts, and other QI tools, best practices, act cycles</td>
</tr>
<tr>
<td>7. Injury Epidemiology</td>
<td>Workplace hazards, worker safety, phases of injury, medico-legal aspects</td>
</tr>
<tr>
<td>8. Medication Safety</td>
<td>Adverse and near-miss reporting, ISMP tools and website, look/sound-alikes</td>
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<tr>
<td>9. Crisis Management Tools</td>
<td>Team work, shared decision making, situational awareness</td>
</tr>
<tr>
<td>10. Simulations</td>
<td>Micro-, macro-, debriefing, immersion levels, scripting, role playing</td>
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Case I: The Role of Human Factors in an Unexpected MI

- A 45-year-old woman for parathyroidectomy with no past medical history, under general anesthesia
- After uneventful induction of anesthesia, the patient became hypotensive
- Resident gave 1 cc of phenylephrine
- HR went to 150’s and VT
- CPR required
- Epinephrine given
- ST changes; TEE-severe LV hypokenesis
Similar Vials: Atropine & Phenylephrine
Elements of Organizational Failure

- Incompatible Goals
- Organizational Structural Deficiency
- Inadequate Communications
- Poor Planning and Scheduling
- Inadequate Control and Monitoring
- Design Failures
- Deficient Training
- Inadequate Maintenance Management
Elements of Organizational Accidents

Task and Environmental Conditions

Individual Unsafe Acts

Organizational Processes

Failed Defenses
## Human Error Rates

<table>
<thead>
<tr>
<th>Error Description</th>
<th>Rate</th>
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<tbody>
<tr>
<td>Error of commission (misreading a label)</td>
<td>3/1000</td>
</tr>
<tr>
<td>Error of omission (item embedded in procedure)</td>
<td>3/1000</td>
</tr>
<tr>
<td>Error of omission (without reminders)</td>
<td>1/100</td>
</tr>
<tr>
<td>Error in simple arithmetic (with self check)</td>
<td>3/100</td>
</tr>
<tr>
<td>Personnel on different shift fail to check conditions unless directed by a checklist</td>
<td>1/10</td>
</tr>
<tr>
<td>Errors under very high stress when dangerous activities are occurring rapidly</td>
<td>25/100</td>
</tr>
</tbody>
</table>

Human vs. Design Flaws

- Human errors (7%) can be reduced by rigorous practices, standardization, simulation training, building a safety culture, etc.
The 93% vs. 7% Rule

Organizational Design
93%

Human Error
(People)

Negligent Conduct
(People)

Reckless Conduct
(People)

Knowing Violations
(People)
Performance Shaping Factors Affecting Human Vigilance

- Fatigue
- Environmental Conditions/Built Environment
- Task Design
- Psychological Conditions
- Competing Demands
- Hand offs/Sign outs
Tools and Methods of Analysis

- Numerous methods and tools are available for analyzing adverse events, near misses, and the context of care.
- Regardless of the tool used, the goal is to determine at the organizational level how to prevent errors from occurring in the future.
Types of Tools

Latent Errors
- Incident Reporting
- Autopsies and M&M Conferences
- Malpractice Claims Files Analysis

Active Errors
- Chart Review
- Administrative Data Analysis
- Information Technology

Adverse Events
- Direct Observation
- Clinical Surveillance
- M&M Conferences

Peterson et al.
Tools and Methods of Analysis

- **Retroactive Analysis**
  - Root Cause Analysis (RCA) is a thorough retrospective investigation to identify factors that contributed to the occurrence of an error.

- **Proactive Analysis**
  - Failure mode and effects analysis (FMEA) identifies potential contributing factors to potential adverse events.
Consider the Microsystem

- Small group of clinicians and staff working together with a shared clinical purpose to provide care for a defined set of patients.
- The clinical purpose defines the essential parts of the microsystem:
  - Clinicians and support staff
  - Information and technology
  - Care processes
- Source of excellence in health care organizations

Mohr(Johnson) J, Batalden P, Barach P. Qual Saf Health Care 2004;13 Suppl 2:34-8
What Are the Essential Elements of a Microsystem?

- Core team of health professionals
- Defined population of patients they care for
- Information & information technology
- Support staff, equipment, environment
- Processes, activities specific to accomplishing the aim
A Microsystem Framework for Analyzing Events

One method that we have found to be useful for systematically looking at patient safety events builds on Haddon’s overarching framework on injury epidemiology.
<table>
<thead>
<tr>
<th></th>
<th>Human</th>
<th>Vehicle</th>
<th>Environment</th>
</tr>
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<tbody>
<tr>
<td><strong>Pre-event</strong></td>
<td><em>Alcohol intoxication</em></td>
<td><em>Braking capacity</em></td>
<td><em>Visibility of hazards</em></td>
</tr>
<tr>
<td><strong>Event</strong></td>
<td><em>Resistance to injury insults</em></td>
<td><em>Sharp, pointed edges and surfaces</em></td>
<td><em>Flammable materials</em></td>
</tr>
<tr>
<td><strong>Post-event</strong></td>
<td><em>Hemorrhage</em></td>
<td><em>Rapidity of energy dissipation</em></td>
<td><em>Emergency medical response</em></td>
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Haddon Matrix adapted to Patient Safety in the Microsystem

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<tr>
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<th>Patient/Family</th>
<th>Health Care Professional</th>
<th>Systems/Environment</th>
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<tr>
<td>Pre-event</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-event</td>
<td></td>
<td></td>
<td></td>
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# Debriefing

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<td></td>
<td>Orientation to the process</td>
<td>Probabilistic Risk Assessment (PRA) Scenario Building Hazard Analysis Checklists</td>
<td>Failure Modes Effects Analysis (FMEA) Human Factors Engineering</td>
</tr>
<tr>
<td>Event</td>
<td>Interview</td>
<td>Crew Resource Management (CRM) Checklists</td>
<td>Root Cause Analysis (RCA)</td>
</tr>
<tr>
<td>Post-event</td>
<td>Interview, Focus Group Interviews</td>
<td>Microsystem Analysis Morbidity and Mortality Conference (M&amp;M)</td>
<td>Root Cause Analysis (RCA)</td>
</tr>
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</table>
Organizational Accident Causation Model

Organization

Management Decisions & Organisational process

Workplace  Person/team  Defenses

Accidents

Latent conditions pathway
Organization Accident Causation Model

Organization
Management Decisions & Organisational process

Workplace
Error & Violation Producing conditions

Person/team
Defenses

Accidents
Workplace Conditions Promoting Unsafe Acts

- High Workload
- Inadequate Knowledge, Ability or Experience
- Inadequate Supervision or Instruction
- Stressful Environment
- Mental State
- Change
Workplace Error Producing Conditions

- Unfamiliarity (x17)
- Time Shortage (x11)
- Poor Human-System Interface (x8)
- Information Overload (x6)
- Negative Transfer (x5)
- Misperception of Risk (x4)

- Inexperience Not Lack of Training (x3)
- Inadequate Checking (x3)
- Poor Instructions (x3)
- Educational Mismatch (x2)
- Disturbed Sleep (x1.6)
Work Environment
Violation Producing Conditions

- Lack of Safety Culture
- Management/Staff Conflict
- Poor Morale
- Poor Supervision
- Condones Violations
- Misperception of Hazard
- Lack of Management Concern
- Little Pride in Work
- Macho Culture
- “Bad outcomes Won’t Happen”
- Low Self-Esteem
- License to Bend Rules
- Ambiguous or Meaningless Rules
Organizational Accident Causation Model

- Organization
  - Management Decisions & Organisational process

- Workplace
  - Error & Violation Producing conditions

- Person/team
  - Errors & violations

- Defenses

Accidents
Person /Team
Individual Unsafe Acts

- Errors
  - Attentional Slips and memory lapses (Intrusions, omissions)
  - Mistakes
    - Rule -based
    - Knowledge-based

- Violations( deliberate deviation from regulation)
  - Routine (shortcuts)
  - Optimizing Violations
  - Exceptional
  - Deliberate
Organizational Accident Causation Model

OrganIZATION

- Management Decisions & Organisational process

WORKPLACE

- Error & Violation Producing conditions

PERSON/TEAM

- Errors & violations

DEFENSES

Accidents
Team video
What are important team competency requirements?
Medical Team Training
Team Competencies

- **Knowledge Competencies**
  - The principles and concepts that underlie a team’s effective performance

- **Skill Competencies**
  - The learned capacity (psychomotor and cognitive) to interact with other team members

- **Attitude Competencies**
  - Internal states that influence team members to act in a particular way
The TeamSTEPPS Framework

- **Knowledge**
  - Shared Mental Model

- **Attitudes**
  - Mutual Trust
  - Team Orientation

- **Performance**
  - Adaptability
  - Accuracy
  - Productivity
  - Efficiency
  - Safety

Miller’s Pyramid

- Knows
- Knows How
- Shows How
- Does
“At what point does this become our problem?”
Break