Collective Mindfulness and high reliability
“Impacts on patient safety”

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OHSU Healthcare Mission & Vision

OHSU Mission
Through innovation, education and clinical expertise, we provide the best possible healthcare experience for patients and their families.

OHSU Vision
Help make Oregon a national leader in health and science innovation to improve the health and well being of all Oregonians

Only Academic Medical Center in Oregon

- Integrated clinical research and education programs
  - Graduate Medical Education
  - School of Medicine
  - School of Nursing
  - School of Dentistry
  - Advanced Practice Nurses
  - Physician Assistant program
- Level 1 trauma center
- Highest patient acuity in Oregon and top 10 CMI in the US (UHC)

OHSU Adult Hospital - 383 Beds
Doernbecher Children's Hospital - 145 Beds
Opening Remarks

- I have no disclosures
- Thank you for the invitation
- I have worked with Sandy Chapman, Christie Burke and Cathy Bush for 15yrs

The Basics

- Learning objectives
  - Understand the rationale for the patient safety imperative
  - Review concept of reliability science
  - How we learn from other industries
  - Translate high reliability construct into practical improvement strategies
- Take home messages
  - Harm occurs at a high frequency in hospitals
  - Traditional quality improvement strategies will only move us to patient safety mediocrity
  - Learning from other industries and translating high reliability concepts into health care will be challenging, but will move us into a ultra safe care

Why should we care about patient safety?

- Institute of Medicine report (1999)
- Disturbing US data
  - 44,000-120,000 deaths/yr in hospitals (est)
  - 7,000 deaths/yr from medication errors
  - Compared to 45,000 deaths from car accidents
- Consumers are expecting it and make informed choices where to seek care
- Costly (LOS, malpractice)
- Joint Commission
- Medical systems increasingly complex
- The problem "isn't going away"
The relationship between errors & adverse events (IHI)

- “Error”: concept of preventability, process-focused
- “Adverse event”: harm, outcome focused
- Relationship between errors and adverse events

Swiss Cheese Model

Need to focus on the “root causes” not just the sharp end of the error


Adverse Events in the Neonatal Intensive Care Unit: Development, Testing, and Findings of an NICU-Focused Trigger Tool to Identify Harm in North American NICUs

- 74 Adverse Events per 100 admissions
- 56% of all Adverse Events “Preventable”

Adverse Events in the NICU setting are substantially higher than previously described. Many events resulted in permanent harm, and the majority were classified as preventable...
...the most important difference among industries...lies in their willingness to abandon historical and cultural precedent and beliefs that are linked to performance and autonomy, in a constant drive toward a culture of safety...

Are we better off 5 years after IOM???

JAMA. 2005 May 18;293:2384-90

Five Years After To Err Is Human
What Have We Learned?

Lisan L. Looe, MD
Donald W. Bowers, MD

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five years ago, the Institute of Medicine (IOM) called for a national effort to make healthcare safer. Although progress since then has been slow, the IOM report truly “changed the conversation” to focus on changing systems, through a broad array of strategies to engage in patient safety, and tools that hospitals are using to ensure the best care. The key to change is to narrow its focus on high-hazard areas, and to prioritize the measures that have the greatest potential to improve outcomes.

What do you call an organization/industry that is complex and risky..... But very safe?

A High Reliability Organization
Definition: High Reliability (AHRQ)
- Organizations or systems that operate in hazardous conditions but have nearly failure free (adverse-events)/performance records
  - Air traffic control system
  - Nuclear power plants
  - Naval aircraft carriers
- Achieve consistently safe and effective performance records despite unpredictable operating environments or intrinsically hazardous endeavors
- Common features
  - Preoccupation with failure
  - Commitment to resilience
  - Sensitivity to operations (“frontline involvement indecisions”)
  - Culture of Safety

Reliability Science
- Principles used to
  - Examine complex systems and processes
  - Calculate overall reliability
  - Develop mechanisms to compensate for limits of human ability
- Adopting these principles-increase likelihood that the system will perform it's intended functions reliably. In healthcare:
  - Help providers minimize defects in care
  - Increase consistency in care
  - Improve patient outcomes

Average Rate Per Exposure of Catastrophes and Associated Deaths Per Activity (“Reliability”)
### Definition: High Reliability (IHI)

- Failure free operation over time from the perspective of the patient.

**Reliability Index:**
- Unstable process: Failure in greater than 20% of opportunities
- $10^{-1}$: 1 or 2 failures out of 10 opportunities
- $10^{-2}$: 1 failure or less out of 100 opportunities
- $10^{-3}$: 1 failure or less out of 1,000 opportunities
- $10^{-4}$: 1 failure or less out of 10,000 opportunities
- $10^{-5}$: 1 failure or less out of 100,000 opportunities
- $10^{-6}$: 1 failure or less out of 1,000,000 opportunities

### Strategies to Address Adverse Events

- Practical-Target top offenders
  - Rational and Logical
  - I contend that this is like being on call, putting out fires…
  - Will get you to $10^{-2}$ or $10^{-3}$ level of reliability

- To really address patient safety, to make a huge impact on patient safety
  - Shift in philosophy
  - Paradigm shift
  - Look to other complex high risk industries who have done this well

### Highly Reliable Organizations

**Characteristics (Attributes):**

- Karl E. Weick, PhD Organizational Psychologist
  - University of Michigan
Attributes of High Reliability Organizations:
(Weick)

1. Preoccupation with failure
2. Reluctance to simplify interpretations
3. Sensitivity to operations
4. Commitment to resilience
5. Deference to expertise

Weick, Managing the Unexpected: Assuring High Performance in an Age of Complexity, Jossey-Bass 2001

1. Preoccupation with failure
   • Small failures are as important as large failures
   • Avoid complacency:
     o Success breeds confidence in a single way of doing things and generates complacency
       • Ex. “My patient has never had a Potassium overdose, so why should I change?”
     o Success narrows perceptions
   • Worry about normalization of unexpected events

2. Reluctance to simplify interpretations
   • Closer attention to context leads to more differentiation of worldviews and mindsets
     o Look for the root cause, not the obvious cause
     o Ex. Dumb resident wrote a 10-fold overdose
       • (Root Cause): “dumb” resident was up all night, in ED with seizing kid, called for verbal order,
Attributes of High Reliability Organizations: (Weick)

3. Reluctance to simplify interpretations
   • Differentiation (diverse viewpoints) brings a varied picture of potential consequences → better precautions and responses to early warning signs
   • Over dependency on insiders leads to simplification
     ▪ Ex. Organizational Intbreeding leads to "The OHSU Way…" "O" is for Optional

4. Sensitivity to operations
   • Attentive to the front line where the real work gets done
   • Authority moves toward expertise:
     o Role of RNs
     o Role of Clinical MDs, PNPs
     o Role of Parents
   • Make continuous adjustments that prevent errors from accumulating and enlarging based upon reporting from operations, not the "master plan"

5. Commitment to resilience
   • Develop capabilities to detect, contain, and bounce back from those inevitable errors that are part of an indeterminate world
     ▪ Ex. Trigger tools (and automation)
   • A focus on intelligent reaction, improvisation
   • Correct errors before they worsen and cause more serious harm
     ▪ Ex. "stop the line"
Attributes of High Reliability Organizations: (Weick)

6. Deference to expertise
   - Decisions are made on the front line, and authority migrates to the people with the most expertise, regardless of their rank
   - Avoidance of the structure of deference to the powerful, coercive, or senior

Organizational Mindfulness: Safety Culture and Change Management. How do we get to a High Reliability Organization

- The term safety culture implies that some organizations are safer than others because of differences in culture
  1. What is organizational culture?
  2. What is the difference between a safe and unsafe organizational culture?
  3. How might we promote change a culture shift

Industry Examples of Organizational Dysfunction

- A failure in mindfulness is defined by Weick and associates as:

  “a cognitive state characterized by a rich awareness of discriminatory detail and a capacity for effective action in response to complex dynamic events”

Jodi’s “Conundrum”

- I will contend that the solution lies “not in a management style that balances competing demands for management oversight and operational autonomy but rather in management sensitivity to MINDFULNESS of the complex operational challenges faced by the organization’s workforce.”

Examples of Organizational Dysfunction

Deepwater Horizon

- 11 Workers Dead!
- 5 million barrels of oil dumped into the Gulf of Mexico
- According to the National Commission there were safety systems and backup safety systems in place. All of which failed at critical times and there were management and team work failures in the areas of poor planning and poor coordination
- Management expressed concerns about personnel safety but neglected system safety entirely
- Some workers expressed discomfort in relation to safety issues but did not elevate their concerns to a management level that could investigate and take action

Figure 1: Deepwater Horizon in the Gulf of Mexico, after blowing out on 20 April 2010
Herald of Free Enterprise

- 193 people died in a sunken vessel
- I. The open hull design that would allow water to slosh to one side
- II. The lack of a bow door indicator on the bridge
- III. The need to ballast the bow down while in port to align with the docking facility

Most of these issues had already been recognized at the operational level but they had not been accorded a high priority for resolution at the management level.

Union Pacific Railroad

- 4 workers died in a rail yard accident in the 1st year of the merger
- 5 workers lost their lives in train-on-train collisions

 implemented a number of cost cutting strategies that created serious problems

Friendly Fire

- Two USAFF-15s shot down by 2 US Army Black Hawk Helicopters

- Coordination within the airborne command and control team was poor
- Coordination between functional units (Army and Air force) was poor
- Senior command staff failed to ensure that due attention was paid to systems integration throughout the operational task force.
Management may be neglectful in regard to their strategic responsibilities or naïve in regard to the operational complexities faced by their workforce. They may be casually inattentive to the operational challenges that demand strategic guidance (Herald of Free Enterprise, Deepwater Horizon, Friendly Fire).

There can be a somewhat casual approach to system safety at all levels of the organizational hierarchy (Deepwater Horizon).

Operational workforce can settle into functional groupings and behavioral patterns that do not coordinate well primarily because of their diverse and possibly incompatible goals (Deepwater Horizon, Friendly Fire).

Members of the operational workforce become aware of issues but do not raise their concerns to management, possibly because they have no confidence the advice will be well received (Deepwater Horizon, Union Pacific Railroad).

The Union Pacific management failed the test of mindfulness by neglecting the operational expertise resident in their workforce. Instead they exhibited mindlessness; they developed a simplistic view of operations which led to imposition of a set of clumsy, disruptive work practices that did not take account of the complexity or the dynamic nature of operations. Mindlessness at either level can disrupt system performance. This concept can, therefore, be employed to cover cognitive states exhibited by both management and operational personnel.
Organizational Health

- It is possible that the patterns associated with organizational dysfunction are in fact, resident in even healthy organizations and that organizations that do suffer a major accident or disruption are just unlucky in that chance factors

“I believe that there are organizations that perform much better because mindfulness is integrated into their organizational culture”

Model of Organizational Mindfulness

- Flight-deck operations on a US Naval Aircraft Carrier

  - Rochlin, LaPorte, & Roberts, 1987 conducted a study that revealed

    - As is characteristic of other high reliability organizations that have been examined, there is a mindfulness in this system that is directed at ensuring productivity and safety. The authority of management is ever-present but it does not impinge on the processes of productive work.

    - The authority of the command hierarchy maintains order and discipline but does not impose constraints on how work units are organized, on how work is managed, or on work processes that are employed.

Culture

- Culture refers to the beliefs, values and behavioral patterns that constitute a way of life

- Culture influences how individuals and groups view the world

- Culture will continue to exist even after all individuals who make up the current group have moved on and have been replaced by others.
How does Safety Culture relate to Organizational Culture?

• The notion of safety culture implies a cultural continuum between health and dysfunction, with different organizations scattered along that continuum.

• However, safety is just one of multiple priorities for an effective organization.

• The assessment of an organization’s safety culture can be taken as an indication of an organization’s cultural health.

Improving Patient Safety: Leadership Role Modeling

• Leaders who are visibly committed to change traditional culture to culture of safety.

• Leaders, at every level of the organization, who enable staff to openly share safety information.

• Leaders who are trusted by staff; staff feel that their comments are heard and acted upon.

• Leaders drive values; values drive behavior of people who work in the organization.

Moving from a Culture of Blame to a Culture of Safety & Accountability

- Reporting errors and adverse events
- Reviewing adverse events
  - Identify systems issues
  - Identify individual choices and behaviors
    - Just Culture context to manage behaviors
      - Simple human error
      - Risk-taking
      - Blatant, reckless behavior
Striving to Improve Patient Safety: Design Improvements into the System

- Provide IT safety tools and systems:
  - CPOE
  - EMR
  - Smart Pumps
- Highly advanced tools and system; what about the team?

PLAN: Process Mapping

<table>
<thead>
<tr>
<th>Process Level 1</th>
<th>Order placed</th>
<th>MD reads questionnaire</th>
<th>MD goes to find patient</th>
<th>MD reviews chart</th>
<th>MD goes back to computer and fills questionnaires</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD orders MRI</td>
<td>MD fills out questionnaire</td>
<td>MD fills out questionnaire prints out at MRI clerk station</td>
<td>MD tech #1 fills out questionnaire</td>
<td>MD tech #2 reviews both questionnaires</td>
<td></td>
</tr>
</tbody>
</table>

- Process Level 2
  - Pop-up with questionnaire
  - MD reads questionnaire on computer screen
  - MD goes to find patient
  - MD reviews chart
  - MD goes back to computer and fills questionnaires
  - Tech calls nurse for quick screening
At one point, the pulmonologist tried to put a mask over [Steve Jobs] face when he was deeply sedated. Jobs ripped it off and mumbled that he hated the design and refused to wear it. Though barely able to speak, he ordered them to bring five different options for the mask and he would pick a design he liked...He also hated the oxygen monitor they put on his fingers. He told them it was ugly and too complex.

- New Yorker, Nov 14th

**Improving Patient Safety: Why Provide Teamwork Training?**

- Non-technical skills of communication and teamwork have been under-recognized and undervalued

- Problems in communication account for more than 60% of Sentinel Events reported to JCAHO

- Promote effective team functioning and communication to foster an environment of mutual respect

- We need to speak the same language....
SBAR: Situational Briefing Model

* Situation – the punch line 5-10 seconds
* Background – the context, objective data, how did we get here
* Assessment – what is the problem?
* Recommendation – what do we need to do?

Organizations as Multi-Level Hierarchical Systems

Closing Remarks

Organizational dysfunction does not result from an emphasis on power and control or on rules, order, and accountability, but rather from a mindless and disengaged approach to the complexities and challenges of work at both the management and the operational levels.
“Together these five processes produce a collective state of mindfulness. To be mindful is to have an enhanced ability to discover and correct errors that could escalate into a crisis.”

Thank You!