Barriers to Change: Why is it so hard to Change Clinician’s Behavior

Paul Barach, MD, MPH
Where are we from?
Who are we?

• We are an overloaded system

• We cannot keep up with complex diagnostic and therapeutic technologies

• We have not changed workflows and roles in the past couple of centuries

• We have placed most emphasis on sickness control, not on health promotion

• We face the same challenges everywhere, but are tackling them independently
Reason #1: Mental Models
"You should’ve seen the look on our faces when we realized that we’d been looking at the x-rays backward for the first hour of surgery."
Mental Models

- The images, assumptions, and stories we carry in our minds of ourselves, other people, institutions, and every aspect of the world
- They determine what we see, and most importantly, *how we act*
What Might this Mean for Our Work?

- Examples from clinical care, education
  - Drug seeking behavior
  - Patient non-compliance
  - “Difficult” patient/family
  - Born surgeon
  - Anesthesia--reading the newspaper, having coffee
  - Bean counter

- How about from our non professional life?
  - Illegal immigrants
  - Women in combat
  - Marriage
Mental Models

- None are perfectly accurate
- Differences in mental models explain how two people can understand the same event differently
- Are generally invisible to us – until we look for them
The Ladder of Inference

1. I take Actions based on my beliefs
2. I adopt Beliefs about the world
3. I draw Conclusions
4. I make Assumptions based on the meanings I added
5. I select "Data" from what I observe

Observable "data" and experiences (as a videotape recorder might capture it)

The Reflexive Loop (our beliefs affect what data we select next time)
Variation in CABG rates per 1000 Medicare Enrollees
CPR Quality during Cardiac Arrest

Two companion studies of CPR quality:

- Chest compressions were not delivered half of the time and compressions were too shallow ("out-of-hospital").
- Quality of multiple CPR parameters was inconsistent and often did not meet published guidelines ("in-hospital").

U.S. Adults Receive Half of Recommended Care

Percent of recommended care received

- Overall: 55%
- Breast Cancer: 76%
- Hypertension: 65%
- Asthma: 54%
- Pneumonia: 39%
- Hip Fracture: 23%
- Diabetes Mellitus: 45%

Hospital acquired infections

- Top quality problem in US.
- 1 in 136 patients~ 2 million patients
- 1 in 5 patients: Morocco, Albania, Tunisia
- Annual direct patient costs @ $45 billion
- 19% perioperative hand compliance rate—NL 2007-2008 (BMJ, under review)
- JCAHO expects > 90%
Human Error Rates

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

Wrong Site Procedures—Identification Problems

No cases of wrong side anesthesia in the literature
40-70 cases/year in Florida reported
JCAHO 300 cases ALL of US 1997-2003
6000 cases NPDB 1990-2003
1300-2600 cases/US/year


www.Wrong-side.org

Miami Herald, 1.27.04
## Why Do They Occur?

<table>
<thead>
<tr>
<th>Human factors</th>
<th>Patient factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• High workload environment</td>
<td>• Older, lower mental function, psychiatric</td>
</tr>
<tr>
<td>• Fatigue</td>
<td>• Sedation or anesthesia</td>
</tr>
<tr>
<td>• Multiple team members</td>
<td>• Patient not consulted before anesthesia</td>
</tr>
<tr>
<td>• Diffusion of authority/lack of accountability</td>
<td>• Patient confusion of side/site/procedure</td>
</tr>
<tr>
<td>• Team communication</td>
<td>• Inability to engage patient (e.g., young child or decreased competence)</td>
</tr>
<tr>
<td>• Change of personnel</td>
<td>• Patient ignorance</td>
</tr>
<tr>
<td>• Haste</td>
<td>• Patient has common name or same name as another patient in hospital</td>
</tr>
<tr>
<td>• Inexperience</td>
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<td>• Incompetence</td>
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<tr>
<td>• Other cognitive factors</td>
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</table>

<table>
<thead>
<tr>
<th>Procedure factors</th>
<th>Attempts to prevent WSPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Wrong side draped/prepped</td>
<td>• Not observing marked site/not marking wrong site</td>
</tr>
<tr>
<td>• Similar or same procedures back to back in same</td>
<td>• Not cross checking for consistency in consent form, patient chart, and OR</td>
</tr>
<tr>
<td>room</td>
<td>booking form.</td>
</tr>
<tr>
<td>• Patient position or room changed prior to initiating procedure</td>
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<tr>
<td>• Site Salience</td>
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</tbody>
</table>

Left-Right Blindness?

Physicians were more likely to have difficulties in distinguishing left from right than university professors and college students
• 8.8% physicians
• 6.0% university professors
• 3.5% college students

Storfer MD.
Problems in left-right discrimination in a high-IQ population.
Risk Factors for Wrong Sided Surgery

- Emergencies (19%)
- Obesity and Physical deformity (16%)
- More than one surgeon in case (13%)
- Performing multiple procedures on multiple parts during single encounter (10%)
- Time pressure to start/end and/or emergency (13%)
- Illegible handwriting
- Exclusion of some team members
- Failure to include patient and family in process
- Unusual OR set-ups
- Inadequate patient assessment
- Lack of institutional policy
- Reliance on surgeon solely to determine site
- Cultural or language barriers

What would you do? JFK International Terminal Men’s Restroom...

- A) Hire an attendant to monitor and reprimand “less hygienic” users
- B) Periodically plot spillage area on a control chart, look for special causes
- C) Double the size of the fixtures
- D) Etch the image of a fly on the porcelain

Source: Wall Street Journal
Answer: Etch the image of a fly on the porcelain...
Reason #2

Current improvement methods in healthcare are highly dependent on vigilance and hard work and ignore the system.
Exercise: Vigilance and Hard Work

1. Recall an experience – in any setting – in which the request that you “try harder,” “be careful,” or “stay alert” improved your performance.
   Why did that work?

2. Identify a process in your organization that relies on vigilance.
   What would you estimate its reliability to be?
The focus on outcomes tends to exaggerate the reliability within healthcare giving clinicians and executives a false sense of security.
Adverse Event Rates in Healthcare

Management Decisions & Organisational process

Error & Violation Producing conditions

Errors & violations

Defenses

Accidents

Latent conditions pathway

DefensesPerson/teamWorkplaceOrganization
Guiding principles
Three strategies to reduce risk

Prevention
Detection
Recovery
Mitigation
Insurance
Reason’s original illustration of resilience illustrates the swing from one type of resilience to another. Note the twist in safety reference compared to the original figure. The successive swings generally correspond to better safety arbitrations to the detriment of competitiveness.

Reason’s revisited illustration of the swing from one type of resilience to another. Note the twist in safety reference compared to the original figure. The successive swings generally correspond to better safety arbitrations to the detriment of competitiveness.
“Not enough money is being spent on safety, so be careful.”
Reason #3
Ignore Role of Human Factors
Paris in the Spring.
DOES THE DAY OF WEEK MATTER?

Mortality After Nonemergent Major Surgery Performed on Friday Versus Monday Through Wednesday

Marc M. Zare, MD,*† Kamal M. F. Itani, MD,*† Tracy L. Schiffner, MS,‡ William G. Henderson, PhD,‡ and Shukri F. Khuri, MD*§

operations performed on Fridays were associated with a higher 30-day mortality rate than those performed on Mondays through Wednesdays:

2.94% vs. 2.18%;
Odds ratio, 1.36; 95% CI, 1.24–1.49)
Medication Cart Drawer—does Your Cart Look different?
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
The Built Environment and Patient Safety

- The physical environment has behavioral side effects
- The designed, built environment determines the setting in which care is delivered
  - Air quality and ventilation
  - Color, texture, reflectance
  - Lighting character, quality, amount
  - Layout and space
  - Noise and vibration
  - Friction/traction

Components of Healthcare Design Quality

- Quality
- Furnishings
- Lighting
- Texture
- Color
- Material
- Size
- Sound
- Wayfinding
- Access to nature
- Aroma
- Materials
- Privacy/Control
- Safety & Security
- Art
- Sound
- Wayfinding
Medication Dispensing Error Rates by Illumination Level (Buchanan et al., 1991)
### The Impact of Design on Patient Outcomes

**Table 1: Summary of the Relationships Between Design Factors and Healthcare Outcomes**

<table>
<thead>
<tr>
<th>Healthcare Outcomes</th>
<th>Single-bed rooms</th>
<th>Access to daylight</th>
<th>Appropriate lighting</th>
<th>Views of nature</th>
<th>Family zone in patient rooms</th>
<th>Carpeting</th>
<th>Noise-reducing finishes</th>
<th>Calling lifts</th>
<th>Nursing floor layout</th>
<th>Decentralized supplies</th>
<th>Acuity-adaptable rooms</th>
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<tr>
<td>Reduced hospital-acquired infections</td>
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<td>Reduced pain</td>
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<td>Reduced patient stress</td>
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<td>Improved patient privacy and confidentiality</td>
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<td>Improved communication with patients &amp; family members</td>
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<td>Improved social support</td>
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<td>Increased patient satisfaction</td>
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<td>Decreased staff injuries</td>
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<td>Decreased staff stress</td>
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<td>Increased staff effectiveness</td>
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<tr>
<td>Increased staff satisfaction</td>
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</table>

* Indicates that a relationship between the specific design factor and healthcare outcome was indicated, directly or indirectly, by empirical studies reviewed in this report.

** Indicates that there is especially strong evidence (converging findings from multiple rigorous studies) indicating that a design intervention improves a healthcare outcome.

Reason #4: Ignore the Microsystems

- 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
- Broader than simple teams, larger context with which providers work, a context that is characterized by: procedures, regulations, management, performance based rewards and penalties.
- Complex but poorly understood impact on the performance of individuals/teams.

A Common View of a Clinical Organization

Chief of Chiefs

Chief of Doctors

Chief of Nurses

Chief of Information
Reason #5 Role of Communication
Unfortunately, animals sometimes lack the necessary skills to communicate with each other.
Role of Hand-offs

- Exchange of vital information
- Shared mental models and cognition of patient status
- Exchange and uptake of responsibility
- Part of the microsystem life-cycle
- Vital to Unit, patients, and workers survival
Psychology of Miscommunication

- Speakers systematically overestimate how well their messages are understood by listeners.

- **Egocentric heuristic**—Senders assume that receiver has all the same knowledge that they do.
  - Worsens for those familiar with each other.

- **Study of pediatric handoffs**
  - *The most important piece of information was not successfully communicated 40% of the time despite the sender believing it had been*

Hand-off as a Form of Communication

“When you move from right to left, you lose richness, such as physical proximity and the conscious and subconscious clues. You also lose the ability to communicate through techniques other than words such as gestures and facial expressions. The ability to change vocal inflection and timing to emphasize what you mean is also lost...Finally, the ability to answer questions in real time, are important because questions provide insight into how well the information is being understood by the listener.”

—Alistair Cockburn
The View from the Catwalk
Anesthesia Resident to Nurse Hand-Off

- Patient in OR
  - Is patient ok to go to PACU? yes
    - Patient goes to ICU
  - No
    - Resident tells circulating nurse about special needs (ventilator, a-line, invasive monitors, etc.)
    - Resident mentally summarizes case to prepare for documentation
    - Resident moves patient to PACU
    - Resident arrives in PACU and shouts out to unit clerk “Where am I going/what number bed?”
    - Sec’y or someone else answers with bed or slot number
    - Resident takes patient to designated slot

- Patient in OR
  - Is patient ok to go to PACU? no
    - Patient goes to ICU

- Are nurses waiting at slot? yes
  - Nursing hooks up monitors with priority on oxygen and pulse ox, then EKG and blood pressure, etc.
  - Is there a greater than 30 second delay in hook up? yes
    - Resident identifies nurses that are taking care of patient
    - Resident gives report (content checklist)
    - Nurses accept patient
    - Resident identifies nurses that are taking care of patient
    - Resident gives report (content checklist)
    - Nurses accept patient
    - Resident completes and signs PACU orders
  - no
    - Resident mobilizes nursing team to put on monitors
    - Resident mobilizes nursing team to put on monitors
    - Resident puts monitor on patient and hooks up oxygen, questions why no nurses
    - Resident identifies nurses that are taking care of patient
    - Resident gives report (content checklist)
    - Nurses accept patient
    - Resident completes and signs PACU orders

Clear delineation of roles/responsibility

Back-up Behavior
Factors in Nurse-Physician Communication

Sharit J, Barach P. Human Factors Proceedings 2005
Influence Diagram

Analysis of Interventions

Reason # 6--Role of Non-technical skills in Teamwork
Research questions

- How do some teams perform and recover so well?
- How do adverse conditions, mediated by team and task processes, lead to negative outcomes (non-routine events and negative team outcomes)?
- Can we reduce the negative outcomes by means of an intervention focused at the team level (non-technical skills) or through the adjustment of external conditions?
The Team

Coding for TEAMS:

S1=Primary Surgeon,
S2=Assisting Surgeon1
S3=Assisting Surgeon2
A1=Anesthetist
A2=Anesthetic Nurse
P1=Perfusionist
P2=Perfusionist
N1=Assisting Nurse
N2=Circulating Nurse
# Types of non-task related NREs

<table>
<thead>
<tr>
<th>Type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>External distractions (pagers, beepers, phones)</td>
<td>80</td>
</tr>
<tr>
<td>Internal sounds (beeps, alarms)</td>
<td>37</td>
</tr>
<tr>
<td>Design of OR (‘battle for real estate’, footstools, wires, tubes)</td>
<td>23</td>
</tr>
<tr>
<td>Hygiene (improper mask wearing, two doors open simultaneously)</td>
<td>20</td>
</tr>
<tr>
<td>Anesthesia-related problems</td>
<td>17</td>
</tr>
<tr>
<td>Monitor problems</td>
<td>17</td>
</tr>
<tr>
<td>Falling on floor (object and instruments drop on floor)</td>
<td>16</td>
</tr>
<tr>
<td>Problems with sterility</td>
<td>16</td>
</tr>
<tr>
<td>Remarkable behavior (drinking coffee in OR, taking a picture, bringing in mail)</td>
<td>13</td>
</tr>
<tr>
<td>Perfusion-related problems</td>
<td>12</td>
</tr>
<tr>
<td>Unintended effects on patient</td>
<td>11</td>
</tr>
<tr>
<td>Bleeding</td>
<td>9</td>
</tr>
<tr>
<td>Absence (personnel arrive too late, heart-lung machine temporarily unmanned)</td>
<td>6</td>
</tr>
<tr>
<td>Equipment failure</td>
<td>4</td>
</tr>
<tr>
<td>Unclear</td>
<td>35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>316</strong></td>
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</table>
Non Technical skills--NOTECHS Tool – 2 dimensions (total 4)

<table>
<thead>
<tr>
<th>LEADERSHIP &amp; MANAGEMENT</th>
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<tbody>
<tr>
<td>Leadership</td>
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<tr>
<td>Maintenance of standards</td>
</tr>
<tr>
<td>Planning &amp; preparation</td>
</tr>
<tr>
<td>Workload management</td>
</tr>
<tr>
<td>Authority &amp; assertiveness</td>
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<table>
<thead>
<tr>
<th>TEAMWORK &amp; CO-OPERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team building/ maintaining</td>
</tr>
<tr>
<td>Support of others</td>
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<tr>
<td>Understanding team needs</td>
</tr>
<tr>
<td>Conflict solving</td>
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</tbody>
</table>
### PROBLEM SOLVING & DECISION MAKING

<table>
<thead>
<tr>
<th>Definition &amp; Diagnosis</th>
<th>Uses all resources / Analytical decision making / Reviews factors with team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option Generation</td>
<td>Suggests options / Asks for options / Reviews outcomes / Confirms opinions</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>Estimates risks / Considers risk in terms of team capabilities / Estimates outcome</td>
</tr>
<tr>
<td>Outcome Review</td>
<td>Reviews outcomes / Reviews new options / Objective, constructive and timely reviews / Makes time for review / Seeks feedback from others / Conducts post treatment review</td>
</tr>
</tbody>
</table>

### SITUATION AWARENESS

<table>
<thead>
<tr>
<th>Notice</th>
<th>Considers all elements / Monitors vital signs &amp; progress of operation / Asks for or shares information / Encourages vigilance / Checks and reports changes / Requests reports and updates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand</td>
<td>Cross-checks above / Shares mental models / Speaks up when unsure / Updates other team members</td>
</tr>
<tr>
<td>Think Ahead</td>
<td>Identifies future problems / Discusses contingencies / Plans for future patient states / Anticipates high workload / Discusses constraints / Uses low workload periods</td>
</tr>
</tbody>
</table>
**Distribution of Major and Minor Events (Barach P, et al 2008)**

**Fig. 4 The distribution of types of major events**

Figure A. 44% of major events were cardiovascular, ventilation and bleeding problems (patient related problems)

**Fig. 5 The distribution of types of minor events**

Figure B. 44% of all minor events communication/coordination and instrumentation problems were detected (not patient related problems)
Model of “Big 5” Teamwork

The TeamSTEPPS Framework

- **Knowledge**
  - Shared Mental Model

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

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

Reason #7 Role of the Culture
STS-107 Columbia Space Shuttle

February 1, 2003 Space Shuttle Columbia and its 7-member crew are lost re-entering the Earth's atmosphere.

The Columbia Accident Investigation Board's independent assessment takes seven months.
Report Blames Flawed NASA Culture for Tragedy

Miscommunication, Bungling Halted Bids for Shuttle Photos

By Rob Stein
Washington Post Staff Writer

NASA never obtained pictures of the space shuttle Columbia in orbit that may have helped prevent the disaster because of a series of misunderstandings, miscommunications and bureaucratic bunglings that exemplify the space agency's problems, investigators concluded yesterday.

Lower-level engineers and officials requested at least three times that the Defense Department use its network of high-powered telescopes and satellites to take pictures of the shuttle's damaged left wing, but the requests were either never acted upon or blocked because of inadequate, imprecise or conflicting follow-ups by the space agency, investigators found.

The requests are among eight "missed opportunities" to obtain images of Columbia is space that might have prevented the shuttle's Feb. 1 destruction, which occurred because a piece of foam insulation hit and damaged a wing during lift-off. The report makes it clear that investigators believe such images could have helped save Columbia and its crew of seven—perhaps by prompting a rescue or repair attempt—and the failure to obtain them underscores leadership fail- ures at the space agency.

While investigators had previ- ously revealed that NASA officials had discussed and even requested that the Pentagon take pictures of the shuttle in space, yesterday's 248-page report by the Columbia Accident Investigation Board for the first time details how those requests arose, were executed and, in the end, were quashed.

See REPORT, A15, Col. 1

Columbia Accident Investigation Board Chairman Harold W. Gehman Jr. and members John Loughdon and Scott Hubbard discuss their findings.

NASA's Deeper Woes

Behind the technical failures, NASA suffered from a decline in public support and its own scientific edge. Page A14

Profit Motive

Investigators found a "potential for conflicts" in the contracting out by NASA of shuttle maintenance and launches. Page A13

In Broad Indictment of Practices, Shuttle Panel Says Safety Suffered

By Kathy Sawyer
and Eric Pianin
Washington Post Staff Writers

The shuttle Columbia and a crew of seven were lost on Feb. 1 because NASA, for the second time in its recent history, allowed its engineering to grow careless, its safety system to wither, its communications to become muddled and its prudent professional curiosity to become stunted.

Those conclusions were part of a far-reaching indictment issued yester- day by the Columbia Accident Investigation Board, in a comprehen- sive and unsparring assessment of the human spaceflight program.

Laying at least part of the blame for NASA's failings on persistent budget and other pressures flowing from Congress and the White House over several administra- tions, the plain-spoken 248-page re-

port is designed to provide the foundation for an unprecedented national debate on the future of hu- man spaceflight, which its board said is long overdue.

A 1.7-pound chunk of foam insula- tion that struck Columbia's left wing at more than 500 mph during the Jan. 16 ascent was "the direct, physical action that initiated the chain of events leading to the loss of Columbia and her crew," the board wrote.

But in chilling echoes of the en- vironment that produced the 1986 Challenger tragedy, the board found that NASA's management and cultural mindset were as cul- pable because they paved the way for the foam strike to do its deadly work. Before the mission, managers did not heed foreshadowings of the potential threat, and during the
“Cultural norms tend to be fairly resilient… the norms bounce back into shape after being stretched or bent. Beliefs held in common resist alteration…. This culture acted over time to resist externally imposed changes.

By the eve of the Columbia accident, institutional practices that were in effect at the time of the Challenger accident had returned to NASA.”
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
- Normalized deviance
Results - Safety Culture in the OR -

- 3 academic PCS teams were “surveyed” on:
  - Adverse event reporting
  - OR management
  - Safety culture
- 72% response rate
- Significant differences (p<0.001) between both institutions regarding communication at all levels
- Significant differences between surgeons and perfusionists vs. nurses re. “trained to use equipment”, and “system take into consideration safety”
- Significant differences in sense of empowerment, safety and organizational backing
- 45% felt that outcomes were not safe
- 33% felt that errors of the same kind keep on recurring
- 47% felt that administration was not sensitive to patient safety issues

Stages in the development of a safety culture

**CALCULATIVE**
We have systems in place to manage all hazards

**PROACTIVE**
Safety leadership and values drive continuous improvement

**REACTIVE**
Safety is important, we do a lot every time we have an accident

**PATHOLOGICAL**
Who cares as long as we’re not caught

**GENERATIVE (High Reliability Orgs)**
HSE is how we do business round here

Increasingly Informed

Increasing Trust and Accountability
Reason #8: Secrecy and non-transparency
The Cloak

- Painfully incorporated desire not to appear incompetent
- Behaviors conferring a sense of protection are greater:
  - The more terrorizing and fatiguing the training or the greater the possibility of catastrophic error on a moment-to-moment basis
- “The problem is we get so used to cloaking our irrational decisions in the guise of wisdom and experience, we confuse good luck with good judgment, and that’s where diagnostic errors often begin.”

  Wachter, RM

"It is incident to physicians, I am afraid, beyond all other men, to mistake subsequence for consequence.“

Samuel Johnson, 1756
When to call for help?

"Nurse, get on the internet, go to SURGERY.COM, scroll down and click on the 'Are you totally lost?' icon."
Disclosing Adverse Events

- Disclosure is required when
  - Has a perceptible effect on the patient not discussed in advanced with patient
  - Necessitates a change in patient care
  - Poses risk to patient’s future health
  - Involves non-consented treatment or procedure
- Reduces chances of being sued
- Transparency in process helps the team address guilt
- New law in Florida requiring disclosure

Barach, P, Cantor M, 2007
Conclusions
“At what point does this become our problem?”
Reason – Complex Systems

Organisational and corporate culture

Management decisions and organisational processes

Latent conditions

Contributory factors influencing clinical practice

Error producing conditions

Violation producing conditions

Triggering factors

Care management problems

Errors

Violations

Unsafe acts or omissions

Defence barriers

Accident/incident
Key Messages

- Local leadership
  - All change is local
  - The research team can’t improve the process that is being studied -- this has to be accomplished by those at the front lines
  - Local champions are necessary to lead and manage the improvement piece
  - Champions need to be nurtured (they won’t necessarily know what to do)


Barriers To Achieving Ultra-safe Healthcare

- Acceptance of limitations on maximum performance
- Abandonment of professional autonomy
- Transition from mindset of craftsman to that of an equivalent actor
- Need for system-level arbitration to optimize safety and develop a culture of safety
- Simplify professional rules and regulations

Average rate per exposure of catastrophes and associated deaths in various industries and human activities
Challenges/Opportunities

- **Sustainability**
  - What happens when you are “done” with the project?
  - How do you sustain the improvement?
    - Identify local champions
    - Build around microsystem
    - Build-in process monitoring and evaluation from the beginning
    - Connect to present clinical and organizational processes

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Questions or Ideas?

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For copies of our Papers and/or Tools in this talk