Sustaining Change in Healthcare
The importance of culture

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Quality and Safety: What does it mean?

The Institute of Medicine (IoM) defines health care quality as “the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”

- **IoM quality domains:**
  1. Effectiveness
  2. Efficiency
  3. Equity
  4. Patient centeredness
  5. Safety
  6. Timeliness

# Existing Quality Gap

<table>
<thead>
<tr>
<th>Condition</th>
<th>% of Recommended Care Received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low back pain</td>
<td>68.5</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>68.0</td>
</tr>
<tr>
<td>Hypertension</td>
<td>64.7</td>
</tr>
<tr>
<td>Depression</td>
<td>57.7</td>
</tr>
<tr>
<td>Orthopedic conditions</td>
<td>57.2</td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td>53.9</td>
</tr>
<tr>
<td>Asthma</td>
<td>53.5</td>
</tr>
<tr>
<td>Benign prostatic hyperplasia</td>
<td>53.0</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>48.6</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>45.4</td>
</tr>
<tr>
<td>Headaches</td>
<td>45.2</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>40.7</td>
</tr>
<tr>
<td>Hip fracture</td>
<td>22.8</td>
</tr>
<tr>
<td>Alcohol dependence</td>
<td>10.5</td>
</tr>
</tbody>
</table>

The Problem is Large

• Estimated adverse event rate of approximately 10% across healthcare

• In the US:
  • Preventable harm causes up to 440,000 deaths per year in hospitals, making it the third leading cause of death
  • Over half a million patients develop catheter-associated urinary tract infections resulting in 13,000 deaths a year
  • Nearly 100,000 patients die from health care-associated infections (HAIs) each year, and the cost of HAIs is $28 to $33 billion per year

Why do gaps in care happen?

• Reasons for variability in practice
  • Lack of multidisciplinary engagement
  • Confusion regarding practice
  • Workflow issue
  • Lack of required resources
  • Provider beliefs and practices

• Need to view the **delivery** of healthcare as a science

System Failure Leading to An Error

Communication between resident and nurse

Inadequate training and supervision

Catheter pulled with Patient sitting

Lack of protocol For catheter removal

Venous air embolism

Patient suffers

Pronovost PJ, Wu Aw, Sexton, JB et al., Ann Int Med, 2004
System Factors Impact Safety

Caregivers are largely not to blame

Adopted from Vincent
# System-Level Factors Can Predict Performance

<table>
<thead>
<tr>
<th>System Factor</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Daily rounds with an intensivist</strong></td>
<td>When ICUs are staffed with a multidisciplinary team, including daily</td>
</tr>
<tr>
<td></td>
<td>rounds with an intensivist, mortality is reduced</td>
</tr>
<tr>
<td><strong>Nurses responsible for more than two patients</strong></td>
<td>When nurses are responsible for more than two patients, there is an</td>
</tr>
<tr>
<td></td>
<td>increased risk of pulmonary complications in the ICU patient population</td>
</tr>
<tr>
<td><strong>Point-of-care pharmacist or pharmacist who participates in rounds</strong></td>
<td>A point-of-care pharmacist or one who participates in rounds reduces prescribing errors</td>
</tr>
</tbody>
</table>
Aviation Accidents per million departures

- US. & Canada operators
- Rest of World
Systems and Behaviors Work Together to Improve Outcomes
How can we improve?

Understand that improvement is a science
1. Accept we are fallible - assume things will go wrong rather than right
2. Every system is perfectly designed to achieve the results it gets
3. Understand principles of safe design - standardize, create checklists, learn when things go wrong
4. Recognize these principles apply to technical and team work
5. Teams make wise decision when there is diverse and independent input
IHI Model for Improvement

- The Plan-Do-Study-Act (PDSA) approach is a useful tool for documenting a test of change
  - Developing a plan to test the change (Plan)
  - Carrying out the test (Do)
  - Observing and learning from the consequences (Study)
  - Determining what modifications should be made to the test (Act)

http://www.ihi.org/resources/Pages/Tools/PlanDoStudyActWorksheet.aspx
The WHO Safe Surgical Checklist

Surgical Safety Checklist

Before induction of anaesthesia
(with at least nurse and anaesthetist)

- Has the patient confirmed his/her identity, site, procedure, and consent?
  - Yes
- Is the site marked?
  - Yes
  - Not applicable
- Is the anaesthesia machine and medication check complete?
  - Yes
- Is the pulse oximeter on the patient and functioning?
  - Yes
- Does the patient have a:
  - Known allergy?
    - No
    - Yes
  - Difficult airway or aspiration risk?
    - No
    - Yes, and equipment/assistance available
  - Risk of >500ml blood loss (7ml/kg in children)?
    - No
    - Yes, and two IVs/central access and fluids planned

Before skin incision
(with nurse, anaesthetist and surgeon)

- Confirm all team members have introduced themselves by name and role.
- Confirm the patient’s name, procedure, and where the incision will be made.
- Has antibiotic prophylaxis been given within the last 60 minutes?
  - Yes
  - Not applicable

Anticipated Critical Events

To Surgeon:
- What are the critical or non-routine steps?
- How long will the case take?
- What is the anticipated blood loss?

To Anaesthetist:
- Are there any patient-specific concerns?

To Nursing Team:
- Has sterility (including indicator results) been confirmed?
- Are there equipment issues or any concerns?

Is essential imaging displayed?
- Yes
- Not applicable

Before patient leaves operating room
(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:
- The name of the procedure
- Completion of instrument, sponge and needle counts
- Specimen labelling (read specimen labels aloud, including patient name)
- Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:
- What are the key concerns for recovery and management of this patient?

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.
Technical Interventions Are Not Enough

Reviewed by The Joint Commission
Regardless of procedure magnitude

Number of Events Reviewed by TJC

0 2 3 60 75 90 94 93 116 149 152


A. Sentinel Event Alert: Wrong-sided surgery Aug 98
B. Sentinel Event Alert: Follow-up review of wrong-sided surgery Dec 01
C. Wrong Site Surgery Summit I Jan 03
D. Universal Protocol 2004
E. Wrong Site Surgery Summit II Feb 07
F. Revised Wrong Site Surgery Definition Jun 10

“Thou shalt” does not translate into improved results.
Improving Safe Care

• The safety culture of an organization is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization's health and safety management.

• Improving care in a lasting manner requires addressing technical and adaptive challenges.
## Improving Safe Care

<table>
<thead>
<tr>
<th>ADAPTIVE WORK</th>
<th>TECHNICAL WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>The intangible components of work, like ensuring team members speak up with concerns and hold each other accountable</td>
<td>Work that we know we should do, like appropriate antibiotic dosing and skin preparation</td>
</tr>
<tr>
<td>Work that shapes the <strong>attitudes, beliefs, and values</strong> of clinicians, so they consistently perform tasks the way they know they should</td>
<td>Work that lends itself to standardization (e.g., <strong>checklists and protocols</strong>)</td>
</tr>
<tr>
<td>Safety culture, including teamwork</td>
<td>Evidence-based interventions</td>
</tr>
</tbody>
</table>
It Takes Culture Change to Get the Most Out of Best Practices

• Culture change is critical to improving briefings and debriefings

• Example: WHO Surgical Safety Checklist
  • Significant reductions in mortality and morbidity
  • 50% of reductions were associated with the amount of culture change in the sites

• Need to think beyond the checklist!

Haynes, et al., 2009
Armstrong Institute Model

Measure

How Often Do We Harm? Are Patient Outcomes Improving?

Have We Created a Safe Culture? How Do We Know We Learn From Mistakes?

Translating Evidence Into Practice

1. Summarize the evidence in a checklist
2. Identify local barriers to implementation
3. Measure performance
4. Ensure all patients get the evidence

Comprehensive Unit based Safety program

1. Educate staff on science of safety
2. Identify defects
3. Assign executive to adopt unit
4. Learn from one defect per quarter
5. Implement teamwork tools

IMPROVE
Focus on promoting safety culture

Association of SSI Incidence and Safety Culture

- Hospital A
- Hospital B
- Hospital C
- Hospital D
- Hospital E
- Hospital F
- Hospital G

What is the comprehensive unit-based safety model?

• An intervention to learn from mistakes and improve safety culture

• It is designed to:
  • Improve patient safety awareness and systems thinking at the unit level
  • Mobilize staff to identify and resolve patient safety issues
  • Create a patient safety partnership between executives and frontline caregivers
  • Provide tools to help teams investigate and learn from defects and improve teamwork and safety culture
Keys to Assembling a CUSP Team

• Understands that patient safety culture is local.
• Composed of engaged frontline providers who take ownership of patient safety.
• Includes staff members who have different levels of experience.
• Tailored to include members based on clinical intervention.
• Meets regularly (weekly or at least monthly).
• Has adequate resources.
Reducing Harm By Applying Principles of Safe Design
# The Armstrong Institute Model to Eliminate CLABSI and Improve Safety Culture

## Translating Evidence Into Practice (TRIP)

1. Summarize the evidence in a checklist
2. Identify local barriers to implementation
3. Measure performance
4. Ensure all patients get the evidence
   - Engage
   - Educate
   - Execute
   - Evaluate

## Central line associated Bloodstream Infections (CLABSI)

1. Wash your hands
2. Use chlorhexidine
3. Use full barrier precautions
4. Avoid the femoral site
5. Ask every day if lines can be removed

## Comprehensive Unit based Safety Program (CUSP)

1. Educate staff on science of safety
2. Identify defects
3. Assign executive to adopt unit
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All ICUs at JHH: CLABSI Rates

Rate per 1,000 central-line days

[Graph showing a decreasing trend in CLABSI rates from 1998 to 2012, with rates starting around 15 and decreasing to around 1.]
### Keystone Michigan ICUs

<table>
<thead>
<tr>
<th>Time period</th>
<th>Median Catheter Related Blood Stream Infection (CRBSI) rate</th>
<th>Incidence rate ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>2.7</td>
<td>1</td>
</tr>
<tr>
<td>Pre-intervention</td>
<td>1.6</td>
<td>0.76</td>
</tr>
<tr>
<td>0-3 months</td>
<td>0</td>
<td>0.62</td>
</tr>
<tr>
<td>4-6 months</td>
<td>0</td>
<td>0.56</td>
</tr>
<tr>
<td>7-9 months</td>
<td>0</td>
<td>0.47</td>
</tr>
<tr>
<td>10-12 months</td>
<td>0</td>
<td>0.42</td>
</tr>
<tr>
<td>13-15 months</td>
<td>0</td>
<td>0.37</td>
</tr>
<tr>
<td>16-18 months</td>
<td>0</td>
<td>0.34</td>
</tr>
</tbody>
</table>
CLABSI Rates at a Tertiary Care Hospital in Karachi, Pakistan

Neonatal ICU

Pre-Intervention Mean: 17.7
Post-Intervention Mean: 3.1

Unpublished data
Improvements Models Work in Healthcare Settings

Aggregated CLABSI Rate for all Abu Dhabi (SEHA) ICUs

Rate per 1000 catheter days

Quarter
Improvement Models Work In The OR

Colorectal NSQIP SSI Rate

- Pre-op warming
- Enhanced sterile technique
- Intervention checklist
- Briefing/Debriefing
- Mechanical bowel prep with oral antibiotics
- CUSP kickoff
- Antibiotic deficiencies addressed
- Skin prep protocol
- Pre-op wash clothes
- SSI Investigation
- Bowel Prep Kits
- EHR support

Collaborative Large-Scale QI Projects

• Central line-associated blood stream infections

• Ventilator Associated Pneumonia
  • Infect Control Hosp Epid. 2011;32(4):305-314

• Colorectal Surgical Site Infections (SSI)

• Surgical Site Infections in Africa
  • Lancet Infect Dis. 2018 May; 18(5): 507-515
104 Michigan ICUs: CLABSI Rates

Median CLABSI rate

Mean CLABSI rate

Rate per 1,000 central-line days

Source: Pronovost, NEJM 2006; Pronovost BMJ, 2010
Impact on Mortality in Michigan

Study Group Adjusted OR
Comparison Group Adjust OR

Pre-implementation (12 months: Oct 02 - Sept 03)
Project Initiation (5 months: Oct 03 - Feb 04)
Implementation (12 months: Mar 04 - Feb 05)
Post-implementation (12 months: Mar 05 - Feb 06)
Post-implementation (12 months: Mar 06 - Dec 06)

Source: Lipitz, BMJ 2011
Why Does This Work

• Guided by science (biologic, human factors, psychology, sociology, economics, epidemiology)
• Has clear theory of change
• Keeps score with measures clinicians believe are valid
• Modifiable locally to fit context
• Focuses on adaptive work
• Unit level intervention with senior support
• Frames clinical problem (like infections) as a collective social problem capable of being solved
• Creates a clinical community for QI
Lessons Learned

• Culture is local
  • Implement in a few units, adapt and spread
  • Include frontline staff on improvement team

• Not a linear process
  • Repeating cycles
  • Culture change is a long-term journey

• Most effective when coupled with a clinical issue
  • Engages frontline providers
  • Adaptive/teamwork intervention alone viewed as ‘soft’

• Leadership roles differ by settings
  • Clinically significant effect on outcomes
Tips for Leading Adaptive Change

• Be unwavering in your goal and invite everyone to help you reach it.
• Surface the real and perceived losses.
• Communicate the need for change.
• Tune into what’s in it for me.
• Seek to understand rather than judge.
• Monitor the organizational pressure.

Pronovost, 2011
“Never doubt that a small group of thoughtful committed people can change the world, for indeed, it is the only thing that ever has.”

- Margaret Meade
Questions?