Translating Evidence into Practice

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Objectives:

• Review common approaches to improve translating evidence into practice

• Review a model for large scale knowledge translation

• Applying the 4Es to creating reliable health care

• Review an approach to improve culture and teamwork using the comprehensive unit-based safety program (CUSP)
## Approaches to Improve TRiP

<table>
<thead>
<tr>
<th>Approach</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-based medicine, Clinical practice guidelines, Decision aids</td>
<td>Provision of best evidence and convincing information leads to optimal decision making and optimal care</td>
</tr>
<tr>
<td>Professional education and development</td>
<td>Bottom-up learning based on experiences in practice and individual learning needs leads to performance change</td>
</tr>
<tr>
<td>Self-regulation, Recertification</td>
<td></td>
</tr>
<tr>
<td>Assessment and accountability</td>
<td>Providing feedback on performance relative to peers, and public reporting of performance data motivates change in performance</td>
</tr>
<tr>
<td>Feedback, Accreditation, Public reporting</td>
<td></td>
</tr>
<tr>
<td>Patient-centered care, Patient involvement, Shared decision making</td>
<td>Patient autonomy and control over disease and care processes lead to better care and outcomes</td>
</tr>
<tr>
<td>Total quality management and continuous quality improvement, Restructuring processes, Quality systems, Breakthrough projects</td>
<td>Improving care comes from changing the systems, not from changes in individuals</td>
</tr>
</tbody>
</table>

Adopted from Grol R. JAMA 2001;286:2578-2585.
<table>
<thead>
<tr>
<th>Strategy</th>
<th>No. of Reviews</th>
<th>No. of Studies</th>
<th>Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational materials, mailed information</td>
<td>9</td>
<td>3-37</td>
<td>Limited effects</td>
</tr>
<tr>
<td>Continuing medical education</td>
<td>4</td>
<td>3-17</td>
<td>Limited effects</td>
</tr>
<tr>
<td>Interactive educational meetings</td>
<td>4</td>
<td>2-6</td>
<td>Few studies, mostly effective</td>
</tr>
<tr>
<td>Educational outreach visits</td>
<td>8</td>
<td>2-8</td>
<td>Particularly affects prescribing and prevention</td>
</tr>
<tr>
<td>Use of opinion leaders</td>
<td>3</td>
<td>3-6</td>
<td>Mixed effects</td>
</tr>
<tr>
<td>Feedback on performance</td>
<td>7</td>
<td>16-37</td>
<td>Mixed effects, effect on test ordering</td>
</tr>
<tr>
<td>Reminders</td>
<td>5</td>
<td>5-68</td>
<td>Mostly effective</td>
</tr>
<tr>
<td>Substitution or delegation of tasks</td>
<td>7</td>
<td>2-14</td>
<td>Pharmacist: effect on prescribing Nurse: no effect</td>
</tr>
<tr>
<td>Use of computer (systems)</td>
<td>4</td>
<td>7-21</td>
<td>Computerized decision support, mostly effective</td>
</tr>
<tr>
<td>Total quality management and continuous quality improvement</td>
<td>1</td>
<td>55</td>
<td>Limited effects, weak study designs</td>
</tr>
<tr>
<td>Patient-oriented interventions</td>
<td>7</td>
<td>2-34</td>
<td>Mixed effects, reminding patients mostly effective in prevention</td>
</tr>
<tr>
<td>Combined and multifaceted interventions</td>
<td>16</td>
<td>2-39</td>
<td>Mostly (very) effective</td>
</tr>
</tbody>
</table>

Grol R. JAMA 2001;286:2578-2585
Translating Evidence into Practice

1. Summarize the Evidence
   - Identify interventions associated with improved outcomes
   - Select interventions with the largest benefits and lowest barriers to use
   - Convert interventions to behaviors
   - Observe staff performing the interventions
   - “Walk the process” to identify defects in each step of intervention implementation
   - Enlist all stakeholders to share concerns and identify potential gains / losses associated with intervention implementation
   - Select Measures (Process and/or outcome)
   - Develop and pilot test measures
   - Measure Baseline Performance

2. Identify local barriers to implementation: understand the process and context of work
   - Envision the problem within the larger healthcare system
   - Engage Collaborative multi-disciplinary teams centrally (stages 1, 2 & 3) and locally (stage 4)

3. Measure Performance
   - Engage
   - Explain why the interventions are important
   - Evaluate
   - Regularly assess performance measures
   - Educate
   - Share the evidence supporting the interventions
   - Execute
   - Design an intervention on “toolkit” targeted to barriers employing standardization, independent checks and reminders, and learning from mistakes

4. Ensure all patients receive the interventions

Translating evidence into practice: A model for large scale knowledge translation

Summarize the evidence

Identify local barriers to implementation

Measure performance

Ensure all patient receive the intervention

Generalizable

- Central Line Associated Blood Stream Infection (CLABSI)
- Ventilator Associated Pneumonia (VAP)
- Venous Thromboembolism (VTE)
- Colorectal Surgical Site Infections (SSI)
Central Line Associated Blood Stream Infections

- > 2 million central venous catheters placed in U.S. ICUs annually
- 16,000 CLABSI in U.S. ICUs annually
- Mortality: 18% (0-35%)
- Annual deaths: 500 - 4,000
- Cost per episode: $28,690-$56,000
- Annual cost: $60 - $460 million

CDC. MMWR 2002; Heiselman JAMA 1994; Dimick Arch Surg 2001
Gap Between Best Evidence and Practice

Knowledge
  – awareness or familiarity (n=77)

Attitudes
  – agreement (n=33)
  – self-efficacy (n=19)
  – outcome expectancy (n=8)
  – inertia of previous practice (n=14)

Behavior
  – external barriers (n=34)

Cabana et al. JAMA 1999
Central Line Associated Blood Stream Infection (CLABSI) Prevention

- Remove Unnecessary Lines
- Wash Hands Prior to Procedure
- Use Maximal Barrier Precautions
- Clean Skin with Chlorhexidine
- Avoid Femoral Lines

www.cdc.gov
Standardize Care
CLABSI Insertion Checklist

Before procedure

- Wash hands
- Sterilize procedure site
- Drape entire patient in a sterile fashion

During procedure

- Use sterile gloves, mask and sterile gown
- Maintain a sterile field

- Did all personnel assisting with procedure follow the above precautions?
- Empowered nursing to stop the procedure if violation occurred

Sample Daily Goals

- What needs to be done for the patient to be discharged?
- What is the patient's greatest safety risk?
- What can we do to reduce the risk?
- Can any tubes, lines, or drains be removed?

<table>
<thead>
<tr>
<th>Room Number</th>
<th>Room Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date _______</td>
<td>Date _______</td>
</tr>
</tbody>
</table>

- Initial as goals are reviewed -

<table>
<thead>
<tr>
<th>Time Slot</th>
<th>0700-1500</th>
<th>1500-2300</th>
<th>2300-0700</th>
</tr>
</thead>
<tbody>
<tr>
<td>What needs to be done for patient to be discharged from the ICU?</td>
<td></td>
<td></td>
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<tr>
<td>What is patient's greatest safety risk and how can we decrease risk?</td>
<td></td>
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<td></td>
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<tr>
<td>Pain Mgt / Sedation (held to follow commands?)</td>
<td></td>
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<tr>
<td>Cardiac / volume status; Net goal for midnight; Beta blockade; review EKGs</td>
<td></td>
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<tr>
<td>Pulmonary/Ventilator (HOB, PUD, DVT, weaning, glucose control); OOB</td>
<td></td>
<td></td>
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<tr>
<td>ID, Cultures, Drug levels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GI / Nutrition / Bowel regimen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can any medications be discontinued? Converted to PO? Adjusted for renal fx?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tests / Procedures today</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What scheduled labs are needed?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What AM labs are needed? CXR? Is patient on critical pathway?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Consultations</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Is the primary service up-to-date?</td>
<td></td>
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<tr>
<td>Has the family been updated? Have social issues been addressed?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can catheters/tubes be removed?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is this patient receiving DVT/PUD prophylaxis?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipated LOS &gt; 3 days: fluconazole PO, LT care plans. LOS &gt; 4 days: ePO</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there events or deviations that need to be reported? ICUSRS?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PROTOCOLS AVAILABLE IF BOLDED**

For Weinberg only: ICU status IMC status Fellow/Attg Initials: ________

Rev 07/2003
## Creating Reliable Health Care

<table>
<thead>
<tr>
<th></th>
<th>Executive Leaders</th>
<th>Team Leaders</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engage</strong></td>
<td>How Does This Make the World a Better Place?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Educate</strong></td>
<td></td>
<td>What Do We Need to Do?</td>
<td></td>
</tr>
<tr>
<td><strong>Execute</strong></td>
<td></td>
<td>How can we do it with my resources and culture?</td>
<td></td>
</tr>
<tr>
<td><strong>Evaluate</strong></td>
<td></td>
<td>How Do We Know We Made a Difference?</td>
<td></td>
</tr>
</tbody>
</table>

*Health Services Research 2006*
CLABSI Rate for All ICUS at JHH: 1998 - Q2 2012

Michigan Keystone ICU
CLABSI Rate: 2004-2012

National Efforts On the CUSP: Stop BSI Program

- 1,071 ICUs in 45 states
- 43% CLABSI reduction
- Number of ICUs that achieved CLABSI rate of ZERO, more than doubled

Lessons Learned

• Harm is preventable
  – Many complications, including HAIs, are preventable
  – Should be viewed as defect

• Focus on systems -- Not individuals

• Far more complex than a checklist
  – Engage frontline staff to identify and fix local defects
Despite Years Of Technical Intervention, Rates Rose

Reviewed by The Joint Commission

Regardless of procedure magnitude

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.
Key Concepts: Technical and Adaptive Work

Technical Work
- Evidence-based interventions

Adaptive Work
- Sweet Spot
- Local culture
## How Will We Get There?

<table>
<thead>
<tr>
<th>TECHNICAL WORK</th>
<th>ADAPTIVE WORK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work that we know we should do, like appropriate skin preparation and use of full barrier precautions</td>
<td>The intangible components of work, like ensuring team members speak up with concerns and hold each other accountable</td>
</tr>
<tr>
<td>Work that lends itself to standardization (e.g., checklists and protocols)</td>
<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>
</tr>
<tr>
<td>Evidence-based interventions</td>
<td>Safety culture, including teamwork</td>
</tr>
</tbody>
</table>
COMPREHENSIVE UNIT-BASED SAFETY PROGRAM (CUSP)

A practical approach to tap into the wisdom of frontline staff and improve teamwork and safety culture
Statewide Michigan CUSP ICU Results
"Needs Improvement"

- **Needs Improvement:** Less than 60% of respondents reporting good safety or teamwork climate

- Statewide in 2004 82-84% needed improvement, down to 22-23% in 2007

![Graph showing safety and teamwork climate improvement](image)

J Critical Care 2008;23:207-221
Crit Care Med 2011;39(5):1-6
CUSP Pre-work
Comprehensive Unit-based Safety Program

• Start in one unit and then spread
• Imperative for frontline staff to be involved
• Build strong partnerships:
  − Infection prevention staff
  − Hospital quality and safety leaders
  − Nurse educators
  − Physician leaders
CUSP Objectives
Comprehensive Unit-based Safety Program

1. Educate staff on science of safety
2. Identify defects
3. Partner with a senior executive
4. Learn from defects
5. Improve teamwork and communication
Increasing rates of infection-related and post-procedural adverse events among patients who required surgery


Yun Wang, Ph.D., Noel Eldridge, M.S., Mark L. Metersky, M.D., Nancy R. Verzier, M.S.N., Thomas P. Meehan, M.D., M.P.H., Michelle M. Pandolfi, M.S.W., M.B.A., JoAnne M. Foody, M.D., Shih-Yieh Ho, Ph.D., M.P.H., Deron Galusha, M.S., Rebecca E. Kliman, M.P.H., Nancy Sonnenfeld, Ph.D., Harlan M. Krumholz, M.D., and James Battles, Ph.D.
Surgical Care Improvement Project (SCIP)

However, improvements in SCIP measures did not translate into improvements in patient outcomes.
How will the next patient be harmed? (SSI Specific)

95 Responses from 36 Staff Members

- Infection Control
- Coordination of Care
- Communication and Teamwork
- Equipment/Supplies
- Policies/Protocols
- Education/Training

Translating evidence into practice: A model for large scale knowledge translation

Summarize the evidence

Identify local barriers to implementation

Measure performance

Ensure all patient receive the intervention

Improvement Model Works In The OR

Colorectal NSQIP SSI Rate at Hopkins

Best Way Forward

• Harm is preventable
  – Many complications, including HAIs, are preventable; Should be viewed as defect

• Informed by science
  – Technical and adaptive teamwork

• Led by clinicians and supported by management
  – Tap into wisdom of frontline staff
  – Need to build capacity
Learning, Development, and Capacity

1. Basic safety-quality Education
   - Target: All healthcare professionals
     - Medical, nursing, and other healthcare professions’ students
     - Residents, fellows

2. Role tailored safety-quality education
   - Target: Healthcare leaders/managers with responsibility for improving safety-quality
     - Patient Safety Certificate
     - Safety fellows

3. Safety-quality experts
   - Target: People aiming for a career in safety-quality work
     - Graduate degrees
     - Career development awards
AI Patient Safety Training

- **Online Patient Safety Certificate**
  - 13 modules, 18 hours

- **Patient Safety Certificate Program**
  - 24 modules, 5 consecutive days

- **Patient Safety Fellowship**
  - 6 months, didactic, mentorship

- **Analytics Leadership in Patient Safety**
  - 12 months, didactic, mentorship

For more, visit [http://www.hopkinsmedicine.org/armstrong_institute/programs/](http://www.hopkinsmedicine.org/armstrong_institute/programs/)