How To Implement Credible QI Projects....

Don Goldmann, MD
Chief Medical and Scientific Officer
Institute for Healthcare Improvement
Clinical Professor of Pediatrics
Harvard Medical School
@DAGoldmann
dgoldmann@ihi.org

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• Without large grants
• By leveraging interprofessional knowledge and skills
• In the conduct of routine work
My Personal Take on the “Science of Improvement”

• **Scientific** regardless of name:
  – Science of improvement
  – Health care delivery science
  – Implementation science
  – Systems strengthening
  – Systems engineering

• **Scientific methods** include
  – “Model for improvement” promulgated by IHI
  – Lean
  – Six Sigma
  – Lean Six Sigma
“Elevator Speech” on Key Attributes of Improvement Science (Model for Improvement Methodology)

- Clear, measurable aim
- A measurement framework in support of reaching the aim
- Clear description of the ideas (content) and how these ideas are expected to impact results (the causal pathway from changes to desired outcomes, and their attributable effect)
  - Conceptual or logic model, or “driver diagram”
- Clear description of the implementation strategy
  - What will be done to ensure reliable adoption of the content
- Dedication to rapid testing (PDSA) - prediction and learning from tests
- Understanding/describing/visualizing systems (process map, value stream)
- Learning from variation and heterogeneity
  - Use of time-ordered data to detect special cause and improvement
  - Understanding why results differ by ward, organization, region
- Application of behavioral and social sciences
Why Clinicians (Especially Physicians*) Are Skeptical About QI

- Many associate QI with old-style, punitive QA (profiling, pay-for-performance)
- QI gurus overemphasize the industrial quasi-”religious” origins of QI and use unfamiliar jargon
- QI experts tend to focus on non-clinical processes and outcomes rather than clinical outcomes of interest to clinicians
- Teams try to do QI “by the book” and get bogged down in tedious process and settle for small incremental improvements
- QI leaders are not up front about the fiscal agenda (“QI is free”)
- QI programs do not provide clinicians with the data they need to improve
- QI experts do not emphasize the academic potential of QI research

*I emphasize physicians because like it or not, improvement in clinical care requires that they be engaged*
Why Physicians who Understand Laboratory Science Should be Comfortable with Rigorous QI

• My ten years working with a PhD scientist to develop a Staphylococcus vaccine...
• The “experimental method,” mice, theories/hypotheses, and PDSAs
  – While the “context” of lab work is far less complex than the “context” of the hospital or clinic, behavioral and contextual issues do come into play
• And why don’t QI leaders keep a “lab book” to document exactly what they are doing and learning?
What to Do

• Leaders must not lose touch with work at the front line
  – Understand that clinicians have limited capacity (time and energy) to take on new QI projects and little capability (skills) in QI methodologies
    A 'work smarter, not harder' approach to improving healthcare quality. Hayes CW, Batalden PB, Goldmann D;BMJ Qual Saf. 2015:24:100-2
  – Clinician “burn out” is increasing, and generally additional time and payment are not provided for QI responsibilities

• Find and address the pain points – “what frustrates you the most?”
  – A personal story – Visits to radiology and the emergency department

http://www.ihi.org/education/ihiopenschool/resources/Pages/Activities/GoodFirstStepToAnyImprovementProject.aspx
https://www.youtube.com/watch?v=831mdPYGouo
What to Do

• Teamwork is essential
  – QI is inherently inter-professional, yet clinicians generally are not trained to work in teams, nurse-physician tensions remain, and work patterns and schedules are hard to synchronize
  – A gulf remains between clinicians at the bedside and critical support personnel, such as pharmacists, physical therapists, and social workers

• Imbed QI, including data collection, in real work – not separate and added on
  – Example: Frustration with physician “maintenance of certification” requirements related to QI in the US
Rigorous, Even Publishable QI Is Possible Almost Anywhere – Without Grants (!)
Personal Experience
Baby Steps: Effect of Standard Antibiotic Order Form on Duration of Prophylaxis

Before use of a standard antibiotic order form

After use of a standard antibiotic order form

Durbin et al. JAMA 1981;246:1796
If They Can Do It in Bogotá during Civil Conflict with Constrained Resources…

Reducing Post-Caesarian Infections
Endometritis After Cesarean Section

Perioperative antibiotic prophylaxis
- Utilization
  - Agent
  - Dose
  - Timing
- Preparation of the skin before surgery
  - Skin antisepsis
    - Antiseptic agent
    - Hair Removal
  - Antiseptic agent
    - Application technique
      - Method
      - Timing
- Surgical technique
  - Technique
    - Training
    - Skill
    - Complications
  - Extraction of the placenta
    - Type of incision
- Peripartum events
  - Vaginal exams
    - Technique
    - Number
    - Labor
      - Presence
      - Duration
    - Presence
    - Duration
    - Rupture of membranes
      - Presence
      - Duration
      - Chorioamnionitis
        - Clinical
        - Subclinical
- Host & Antenatal Factors
  - Preexisting host factors
    - Underlying diseases
  - Pregnancy-related conditions
    - Bacterial vaginosis
  - Prenatal care
Meta-Analysis the Effect of Antibiotic Prophylaxis on Infection Rates after Cesarean Section

## Priority Matrix

<table>
<thead>
<tr>
<th>Factor</th>
<th>Importance</th>
<th>Within the capacity of hospital personnel to improve</th>
<th>Timeframe for improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotic prophylaxis</td>
<td>4</td>
<td>4</td>
<td>short</td>
</tr>
<tr>
<td>Skin preparation</td>
<td>3</td>
<td>4</td>
<td>short</td>
</tr>
<tr>
<td>Surgical technique</td>
<td>4</td>
<td>4</td>
<td>medium</td>
</tr>
<tr>
<td>Antenatal factors</td>
<td>3</td>
<td>1</td>
<td>long</td>
</tr>
<tr>
<td>Peripartum events</td>
<td>4</td>
<td>2</td>
<td>medium</td>
</tr>
</tbody>
</table>
### Utilization and Timing of Antibiotic Prophylaxis for Cesarean Section

<table>
<thead>
<tr>
<th></th>
<th>% receiving prophylaxis</th>
<th>% receiving prophylaxis ≤1 hour after delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital A</td>
<td>70%</td>
<td>31%</td>
</tr>
<tr>
<td>Hospital B</td>
<td>32%</td>
<td>70%</td>
</tr>
</tbody>
</table>
Hospital A: Existing System

Plan to perform C/S

Prescribe prophylaxis?
- Yes: MD writes prescription
- No: Transport antibiotic to patient

Antibiotic in L&D or pharmacy?
- Yes: Administer antibiotic
- No: MD writes prescription

Family buys antibiotic at pharmacy outside the hospital

Start

Delivery

End
Hospital A: Revised System

- **Plan to perform C/S**
  - MD writes prescription
  - Nurse puts antibiotic in packet of supplies
  - Packet transported to operating room with patient
  - Packet transported to operating room with patient
  - Start
  - Delivery
  - Administer antibiotic
  - End
Utilization and Timing of Perioperative Antibiotic Prophylaxis & Surgical Site Infections After Cesarean Section

Experiential Learning – Making Rigorous QI Part of Routine Work at the Point of Care
Monitoring Patient Safety

- Voluntary event reporting
- Morbidity and mortality conferences/reports
- Chart auditing
  - IHI Global Trigger Tool
- Automated data mining
  - Patient Safety Indicators (AHRQ PSIs)
  - Automated trigger tools
- Random Safety Audit
Random Safety Audit

- Translated from industry (banking and random process audits via Paul Plesk)
- Real time by the front line
- Data and feedback virtually immediate
  - Reliability of key safety processes evident immediately
  - Motivating, enabling, reinforcing; builds self-efficacy and social norms (key elements of behavioral change theory)
- Combines audit and feedback with iterative PDSAs
  - Even better than “what can I try by next Tuesday”
Random Safety Audit

• Systematically monitors a subset of error-prone points in the system that have the potential to harm patients
• Items selected randomly to be addressed either on
  – On multi-disciplinary rounds (provider input required)
  – Any time during day (provider input not needed)
• Deck can be “packed”
• 20 items developed by expert consensus for testing in NICU (21st item added later)
• 4X6 “cards” include yes/no data form; trivia question on back
Staff Perceptions of the Random Safety Audit

- 84% of staff participated in rounds on which audit performed
- 100% agreed or strongly agreed that this improved quality and safety
- 95% agreed/strongly agreed that it increased knowledge of clinical guidelines and safety goals
- Only 9% agree with statement “asking a safety question of rounds took up too much time”
Three Simple Examples of Interprofessional QI Involving Junior Doctors

- Do you know who your doctor is?
- Understanding drug usage and reducing unnecessary prescriptions
- Learning how to look for medical errors as part of routine work
Try Something Yourself

• At work – “You are always late for rounds!”
• At home – avoiding the weed whacker
  (http://www.ihi.org/education/IHIOpenSchool/resources/Pages/Activities/PDSACyclesFromCLABSIsToCucumbers.aspx)
Ten Tips for Incorporating Rigorous Quality Improvement into Everyday Work

BMJ Qual Saf. 2011 Apr;20 Suppl 1:i69-72
Tip 1

- Select projects that really will make a difference to providers and patients
  - Focus on clinically relevant projects that substantially improve those processes of care that are tightly linked to the outcomes of interest to providers and patients
  - Think of a headline the CEO or CMO would want to feature on the organization’s website
Tip 2

• Set bold, clear, measurable aims and a specific timeline for achieving them
  – Think of fundamental advances that will measurably impact care and outcomes and engage clinical staff
Tip 3

• Assemble a multi-disciplinary team including providers, stakeholders, and methodologists, tailored to the specific aim of the project
  – Be agnostic with respect to disciplines and titles when assigning roles and rewards
  – If publication is anticipated, define roles and authorships very early on
    – Giving appropriate first authorships to non-MDs does not jeopardize publication in leading journals
Tip 4

• Be creative in recruiting experts
  – Behavioral scientists, sociologists, economists, epidemiologists, statisticians, qualitative researchers, and other experts often are looking for opportunities to partner with clinical researchers, especially if there is a prospect of co-authorship
Tip 5

- Adopt the most rigorous study design possible without disrupting routine work unduly
  - Incorporate data collection into usual activities of professional staff (e.g., infection control, clinical pharmacists)
Tip 6

• Do everything possible not to sacrifice data quality and completeness
  – Develop simple data collection tools that also simplify and increase reliability of daily work
  – Checklists and standardized order sets are especially useful
Tip 7

- Take advantage of emerging certification requirements for clinical staff and make improvement academically viable
  - MOC requirements can be satisfied by improvement activities (eg: Vermont Oxford’s NICQ collaborative)
  - Morph “good citizen” work, such as CPG development and evaluation, into publications and other CV-worthy work products
Tip 8

- Do not assume that substantial external grant funding is required to perform credible quality improvement work
  - Leverage institutional resources
  - Encourage development of institutional small grant awards for quality improvement
  - Consider support from payers, industry, and professional societies
  - Look for “free” hands, such as graduate students
Tip 9

- Pay careful attention to the ethics of quality improvement work, but try to craft projects that are unlikely to require formal IRB approval
  - Remember
    - Poorly designed projects are unlikely to yield useful knowledge and arguably are not ethical
    - Patients have a right to expect that unexpected consequences will be considered and monitored
Tip 10

- Anticipate publication
  - Apply the SQUIRE guidelines
  - Write a “dummy” abstract and construct “dummy” tables and figures
  - Be clear about authorships
  - Make the most of “negative” studies

Davidoff et al., Qual Saf Health Care 2008;17(Suppl 1):13-19