Principles and Methods of Quality Improvement—Using CQI to improve Infection Control Practices

Review of the Cesarean-section Antibiotic Prophylaxis Program in Jordan and Workshop on Rational Medicine Use and Infection Control

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Acknowledgment

Materials adapted from—

• A Modern Paradigm for Improving Healthcare Quality

Outline

• Principles of improvement
• Improvement process
• Continuous Quality Improvement methodology used for the Jordan Antibiotic Surgical Prophylaxis Project
• Quality improvement tools
• Summary
What is High Quality Health Care?

- The right care administered the right way* at the right time with efficient use of resources

* using established methods and delivered in a way that is acceptable to the patient
Achieving Improvement

• Implementing (waiting for) the next “big” thing*
Vs.
• Closing gaps in care using existing resources

* New diagnostics, therapeutics, or prevention measures
Principles of Improvement (1)

• Client (patient) focus
  • Care should be designed to meet the needs and expectations of patients and the community

• Understand the system of care
  • Providers must understand the system of care, including its inputs, key processes, and outcomes, to improve care
Principles of Improvement (2)

- Teamwork
  - System improvement is achieved through a team approach to problem solving
- Test changes in the system using data
  - Data are used to analyze processes, identify problems, and to determine whether changes in the system have resulted in improvement
Client Focus—Needs and Expectations

• Technical performance
• Effectiveness of care
• Service delivery efficiency
• Safety
• Access to services
• Interpersonal relations
• Service continuity
• Physical infrastructure and comfort
• Choice
Understand the System of Care

• Inputs
  • People, infrastructure, materials, information, and technology

• Processes
  • Sequence of activities involving inputs and decision-making

• Outcomes
  • Clinical outcomes, length of stay, cost, patient satisfaction

• System
  • Sum of elements that interact together to achieve an objective
Conceptual Design of a System

<table>
<thead>
<tr>
<th>Resources (Inputs)</th>
<th>Activities (Processes)</th>
<th>Results (Outputs/Outcomes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>1. What is done</td>
<td>Health services delivered</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>2. How it is done</td>
<td>Change in health behavior</td>
</tr>
<tr>
<td>Materials/drugs</td>
<td></td>
<td>Change in health status</td>
</tr>
<tr>
<td>Information</td>
<td></td>
<td>Client satisfaction</td>
</tr>
<tr>
<td>Technology</td>
<td></td>
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</tbody>
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Source: Donabedian (1980)
Teamwork

• Team
  • A high-performing task group whose members are interdependent and share a common objective

• Team members
  • Key players in the parts of the system being improved (stakeholders), experts, people being affected by the system
Test Changes in the System Using Data

- Improvement requires change
- Not all change is improvement
- Data are required to demonstrate that change is improvement
Improvement Process

1. Identify—
   • Determine what to improve

2. Analyze—
   • Understand the system

3. Develop—
   • Design a change to improve the system

4. Test and implement—
   • Test the change and decide whether to abandon, modify, or implement (study, act, plan, do)
Rapid-Cycle, Small-Scale Tests of Change
Identify

- What is the problem?
- How do you know it is a problem?
- How frequently does it occur?
- How long has it existed?
- What are the effects of the problem?
- How will you know when it is resolved?
Analyze

• Describe the system
  • Qualitative—describe the inputs, processes, and outcomes, and their interactions
  • Quantitative—measure the performance of the system
• Formulate ideas about how the system could be improved
Develop

• Develop a series of small changes to be tested sequentially
• Anticipate resistance to change and take steps to minimize it
  • Involve key stakeholders in the work
  • Educate and communicate
Continuous Quality Improvement Methodology used for Jordan CS Project

• Initial workshop – April 2011
• Development of a workplan at each hospital
• Development of a Continuous Quality Improvement (CQI) team at each hospital
• Self-assessment doing feasible activities
• Sharing results at review workshop – March 2012
CQI methodology used for Jordan CS Project (2)

- **Identify** – The use of antibiotics for CS surgical prophylaxis was identified to be suboptimal and wasteful practice.
  - The use of multiple antibiotics (at most hospitals) in multiple doses over several days including at discharge from the hospital
  - The initial dose was frequently given after the surgical procedure
CQI methodology used for Jordan CS Project (3)

• **Analyze** – The system was fragmented, no guidelines available.
  - Review of hospital practices show multiple antibiotics for multiple doses for CS prophylaxis
  - Systematic reviews (Cochrane), RCTs, cohort studies, international guidelines all show a single antibiotic, before surgery is sufficient to provide prophylaxis
CQI methodology used for Jordan CS Project (4)

- **Develop a Change** – New guidelines/protocols for CS prophylaxis were developed and implemented.
- **Test and Implement** - protocols were provided to medical staff. Follow-up procedures and tools were developed to monitor including:
  - CQI meetings
  - Monitoring log
  - CQI tool to record CS prophylaxis and results of indicators
CQI methodology used for Jordan CS Project (5) -

1. Plan
   - Develop a plan of change
   - Collect baseline data
   - Educate and communicate

2. Do
   - Test the change
   - Verify that the change is being tested
   - Collect data about the process being changed

3. Study
   - Verify that the change was tested according to plan
   - See if data are complete and accurate
   - Compare the data with baseline data
   - Compare actual results with predicted or desired results

4. Act
   - Summarize and communicate
   - If the change does not yield the desired results, modify/abandon plan and repeat PDSA
   - Implement a successful change
   - Monitor the change over time
   - Consider implementing the change throughout the system
Quality Improvement Tools

• Identify
  • Brainstorming
  • Affinity analysis
  • Cause-and-effect diagrams

• Analyze
  • Flowcharts
  • Data presentation
    • Pie chart
    • Histogram
    • Run chart

• Develop
  • Benchmarking
  • Storyboards

• Test and implement
  • Gantt charts
  • Storyboards
What Is the Value of These Tools?

They organize the team and help make it more efficient.

- Brainstorming, cause-effect diagram
  - Analyze available information
  - Acknowledge that many factors affect the outcome
  - Gather information from multiple sources: literature, experts, people involved in the system

- Priority matrix, Pareto diagram
  - Rank and prioritize problems and interventions
  - Target work toward the biggest problems
    - Only some factors are within control
    - Only a subset of these can be optimized quickly with existing resources
What Is the Value of These Tools? (2)

- Flowcharts, process measures, run charts
  - Evaluate systems: qualitative and quantitative
  - Target specific areas for improvement
  - Monitor trends in effects of changes
What Is the Value of These Tools? (3)

• Provide a logical history of the team’s work
• Keep work on track
  • Orient new team members
  • Report to leaders
• Simple and applicable to a wide range of problems
Summary

- Improving infection control practices is a key strategy to prevent nosocomial infections and contain AMR.
- A system to identify poor infection control practices and to introduce interventions to improve practices is essential.
- Improving infection control practices and subsequently reducing nosocomial infections and AMR is facilitated and enhanced by using a quality improvement approach.