HOW TO DEVELOP QUALITY INDICATORS?

H. Tom Stelfox, Critical Care Canada Forum 2013
Disclosures

- No disclosures or conflicts of interest
Objectives

1. Emphasize the importance of measuring health care quality

2. Overview of quality indicators

3. Describe a quality indicator development process
   - J Clin Epidemiol 2013
Problem – Quality of Care

- 98,000 die in US hospitals from error each year

- Quality problem includes critical care:
  - Patients do not receive recommended care
  - Medical errors & adverse events are common
Patient Safety Publications Before & After IOM Report

Stelfox et al. IQSH 2006
<table>
<thead>
<tr>
<th>Response</th>
<th>Physicians (N=831)</th>
<th>Public (N=1207)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error made in own or family member’s care</td>
<td>35%</td>
<td>42%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Health consequences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serious</td>
<td>18%</td>
<td>24%</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Minor</td>
<td>10%</td>
<td>13%</td>
<td>0.03</td>
</tr>
<tr>
<td>None</td>
<td>7%</td>
<td>5%</td>
<td>0.06</td>
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</table>
The Challenge – Quality Measurement & Improvement

“If you can’t measure it you can’t manage it”

Peter Drucker
Annual report card sought for hospitals

Standard criteria needed, expert says

BY JANE COUTTS
Health Policy Reporter

EDMONTON — Giving the public better access to health information will force improvements by hospitals and other health-care providers, a top health expert says.

“I believe every health organization in Canada should put out an annual report card,” said Michael Decter, a former deputy minister of health in Ontario who is now chairman of the Canadian Institute of Health Information.

He told a national conference on
Heart Bypasses Are Safer, Study Shows

But a Few Hospitals Fall Below Average

BY ELISABETH ROSENTHAL

The safety of cardiac bypass surgery in New York State hospitals has continued to improve, although a few hospitals and surgeons had track records that were significantly worse than the average, state health officials reported yesterday.

In releasing its annual survey of the bypass operations, the State Health Department described the results as extremely good, since the chance of dying after bypass surgery in New York is lower than that reported from any other area of the country.

"Patients in New York are lucky," said Dr. Barbara DeBuono, the State Health Commissioner, noting that the chance of dying from the procedure had decreased almost 30 percent in the last five years.

But the study, which each year evaluates 31 hospitals and dozens of cardiac surgeons performing bypass surgery in the state, also raised red flags regarding some hospitals and doctors, pointing to areas that need improvement. Three upstate hospitals — Buffalo General, Strong Memorial in Rochester and University Hospital — showed performances that were statistically worse than the statewide norm.

Based on 1993 data, the state found that two hospitals, Saint Francis Hospital in Roslyn, L.I., and New York Hospital-Cornell Medical Center in Manhattan, had unusually good statistical ratings this year, according to the report. Although the rates of the remaining 28 hospitals differed somewhat, they were statistically indistinguishable, said state health officials.

The three hospitals that fared poorly in the report said that state's statistics were outdated, that the analysis did not adequately take into account how sick patients were before surgery and that the state's method of statistical analysis could incorrectly identify a hospital as a

<table>
<thead>
<tr>
<th>RATES</th>
<th>HOW THE STATE'S HOSPITALS FARED</th>
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<tbody>
<tr>
<td>Albany Medical Center</td>
<td>Amor Ogden</td>
</tr>
<tr>
<td>Bellevue</td>
<td>Beth Israel</td>
</tr>
<tr>
<td>Buffalo General</td>
<td>Ellis Hospital</td>
</tr>
<tr>
<td>Erie County</td>
<td>Long Island Jewish</td>
</tr>
<tr>
<td>Lenox Hill</td>
<td>Marimontes</td>
</tr>
<tr>
<td>Millard Fillmore</td>
<td>Montefiore Moses</td>
</tr>
<tr>
<td>Montefiore Wasser</td>
<td>Mount Sinai</td>
</tr>
<tr>
<td>N.Y.U. Medical Center</td>
<td>New York Hospital</td>
</tr>
<tr>
<td>North Shore</td>
<td>Presbyterian</td>
</tr>
<tr>
<td>Rochester General</td>
<td>St. Francis</td>
</tr>
<tr>
<td>St. Joseph's</td>
<td>St. Luke's</td>
</tr>
<tr>
<td>St. Peter's</td>
<td>St. Vincent's</td>
</tr>
<tr>
<td>Strong Memorial</td>
<td>United Health Services</td>
</tr>
<tr>
<td>University Hospital of Brooklyn</td>
<td>University Hospital St. Barnabas</td>
</tr>
<tr>
<td>University Hospital, Stony Brook</td>
<td>Upstate Medical Center</td>
</tr>
<tr>
<td>Westchester County</td>
<td>Winthrop University Hospital</td>
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</tbody>
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The State Health Department says that, based on statistical variation, it is 95 percent confident that the rate falls within the margin of error. Where gray bars overlap, there is no statistically significant difference in the rates.

Statewide rate: 2.71%

Variation from Statewide Rate:

- Significantly higher
- Significantly lower

(A low mortality rate indicates better patient outcomes.)
What are Quality Indicators?

- Performance measure

- Borrowed from industrial process control systems literature

- National Library of Medicine defines “qualitative & quantitative measures used in determining the quality of care”
Sample Quality Indicators

Industrial Process Indicator

- Cycle time = total time from the beginning to the end of your industrial process as defined by the producer & customer

Healthcare Indicator

- Time to first medical contact = time from onset of symptoms to first medical contact
Quality Indicator Development Overview

- Develop a measurement framework
- Determine if quality indicators are needed
- Establish quality indicator criteria
- Select a development approach
- Evaluate the indicators developed
- Develop a maintenance plan
- Develop an implementation plan
Conceptual Measurement Framework

Gruen et al. BJS 2012
Do you need a Quality Indicator?

- Burden of illness
  - Is this an important problem?

- Opportunity for improvement
  - What is the current quality of care?

- Better care & better health
  - Will improving quality of care improve patient health?

- Gaps in existing quality indicators
  - What are the existing quality indicators?
  - What is the supporting evidence base?
  - What indicators are currently used in practice?
Scoping Review Quality Indicators

Stelfox et al. Arch Surg 2010
Quality Indicator Criteria

- **Important** – audiences will find the information useful for a purpose

- **Scientifically sound** – measure will produce consistent & credible results

- **Feasible** – can be implemented

- **Usable** – target audience can understand the results & use for decision making
Development Approaches

- Deductive approach
  - Concept $\rightarrow$ data
  - E.g., door-to-balloon time for myocardial infarction

- Inductive approach
  - Data $\rightarrow$ concept
  - Common approach used for local quality improvement
Quality Indicator Development

- Research Synthesis
- International Audit of QI Practices

Potential Quality Indicators

Consensus Method

Quality Indicators for Evaluation of Implementation

Evaluation of Implementation

Final Quality Indicators

Years 1-2

Year 3

Years 4-5

Santana Ann Surg 2013
## 23. Spine Evaluation

### Description of Indicators

<table>
<thead>
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<th>Description of Indicators</th>
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<tr>
<td>Relationship to Quality</td>
<td>Medical care should be safe and effective</td>
</tr>
<tr>
<td>Type of Indicator</td>
<td>Hospital process, Hospital level</td>
</tr>
<tr>
<td>Proposed Data Sources</td>
<td>Hospital Medical Record</td>
</tr>
<tr>
<td>Definition</td>
<td>Number of patients with evaluations and decisions regarding immobilization of the spine within 36 hours of hospital admission per 100 patients</td>
</tr>
<tr>
<td>Numerator</td>
<td>All patients age 18 years and older admitted to hospital with an injury diagnosis from a blunt force mechanism AND documented assessment of the cervical, thoracic and lumbar spine AND decision to continue OR discontinue spine immobilization* within 36 hours of admission to hospital*</td>
</tr>
<tr>
<td>Denominator</td>
<td>All patients age 18 years and older admitted to hospital with an injury diagnosis from a blunt force mechanism</td>
</tr>
<tr>
<td>Benchmark</td>
<td>Not specified at present</td>
</tr>
<tr>
<td>Risk Adjustment</td>
<td>Not applicable</td>
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Key Development Issues

- Clear purpose & goal
- Evidence, expertise & patient perspectives
- Consider context & variation
- Data collection & management
Evaluating Quality Indicators

- How strong is the scientific evidence?
- Are all individuals in the denominator equally eligible for inclusion in the numerator?
- Is the measure result under control of those whom the measure evaluates?
- How well do the specifications capture the event?
- Does the measure provide for fair comparisons?
- Does the measure allow for exclusion of rare performance related characteristics when appropriate?

National Quality Measure Clearinghouse
Evaluating Quality Indicators

- Reliability
  - Consistency or stability of the measure

- Criterion validity
  - Does the quality indicator agree with a reference standard

- Case-mix
  - Influence of comorbid illness & illness severity

- Impact analysis
  - Processes & outcomes of care
  - Resource requirements
Risk Adjusted Hospital Readmission

Moore 2013
When & How to Update?

- Regular review
  - Clinical systematic reviews ≈ 2 yrs (Shojania)
  - Clinical practice guidelines ≈ 5 years (Shekelle)

- Ad hoc review
  - update triggered by new science

- Review outcomes
  - Retain vs. revise vs. replace vs. retire

Implementation

- Integrated knowledge translation
  - Target most urgent needs of end users
  - Identify facilitators & barriers to implementation
  - Engage users in evaluation & maintenance

- Packaging indicators for ease of use
  - End user organizations may post
  - Incorporate into accreditation standards
  - National Quality Measures Clearinghouse
  - www.qualitytraumacare.com
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Those Ontario Hospital Ratings......

Left! Go left!
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www.qualitytraumacare.com