Changing Behavior: Educating Leadership Via Dashboards

Data Analytics in Healthcare
ASQ Long Island 303 - Hofstra University Symposium
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“Data open the door so that all can see what is happening at the bedside and demand accountability.”

“The quality improvement approach by which LIJMC overhauled the entire system of care, which should also translate well to other types of surgery, should serve as an outstanding example to cardiac surgery programs throughout the world.”

TWO LANDMARK REPORTS published in 1999 and 2001 that changed the perceptions of health care quality

**IOM Definition of Quality:**
The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.
“Measurements in Health Care is a tool for improvement, not an end point or a solution in itself...have the potential to be empirically assessed and systematically monitored or compared as a route to improvement.”

Source: Vital Signs Core Metrics for Health and Health Care Progress, p. 103
Building a Quality culture depends on building an analytic culture. Certain cultural attributes help to reinforce an analytical culture through transparency.
Drivers of Change

Never Events

Value Based Purchasing

Waste Dartmouth Atlas

P4P
Quality Management Program

**Traditional Management System**

**PLAN**
- Benchmarking
- Define problem
- Develop assumptions
- Identify possible causes
- Identify potential solutions
- Determine baseline performance, goals, targets, and methods

**Team Approach**

**DO**
- Implement solutions
- Collect data
- Begin data analysis

**Culture**

**STUDY**
- Complete data analysis
- Evaluate/Compare results
- Summarize the findings
- Measurements

**Consumer Driven Health Care**

**ACT**
- Communicate results
- Draw conclusions
- Recommend actions
- Process Management

**Patient Centered Environment**

Management provides focus and direction for quality improvement efforts of employees.
- Statistical Process Control
- Education

**North Shore LIJ**

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“...creates demand for performance metrics and motivates managers and employees to attend to them.”

Source: Analytics at Work: Smarter Decisions Better Results, p. 144.
Integrating Data/Generating Reports

Crystal Reports

KQMI Oracle Data Warehouse

- Billing System
- Premier Risk Adjustment & Benchmarking Quality Advisor
- Web-Based Clinical & Operational Data
  - IHI Global Trigger Tool
  - Sepsis Database
- Electronic Health Record
  - Sunrise Eclipsys
  - Allscripts
- Other External Sources
  - Press-Ganey
  - AHRQ Safety
  - AHA GWTG
  - NHSN (IC)
  - Core Measures
KQMI Analytics & Interpretation

- Web-Based Portals
- Data & Variable Construction
- Data Warehousing
- Database Construction
- Define & Assess Quality Indicators
- Statistical Analysis

Hypothesis testing
- Parametric & non-parametric statistics
- Chi-square
- ANOVA
- Factor analysis
- Linear regression
- Logistic regression
- Multiple regression
- Structural equation modeling
- Geospatial mapping

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Krasnoff Dashboard Characteristics

- Provides accessibility through Intranet
- Fosters accountability to the governing body
- User friendly for administrators, clinicians & staff
- *Educational (tutorial and explanatory key)
- Enables feedback through in-depth analysis
- Illustrates changes – i.e., are improvements successful?
- *Additional Education provided via E-Learning Programs
“...analyzing Web data and metrics is a good place to begin building an analytical culture because the data is rich [the employees] involved are typically young and technology focused, and the Web is an increasingly important customer channel for most organizations.”

Source: Analytics at Work: Smarter Decisions Better Results, p. 145.
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<th>YTD as of</th>
<th>Indicator Name</th>
<th>YTD</th>
<th>Threshold</th>
<th>Goal</th>
<th>Stretch Goal</th>
<th>Desired Direction</th>
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<td>Risk Adjusted Mortality Index</td>
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<td>1.09</td>
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Example of Control Chart

Nosocomial Methicillin Resistant Staphylococcus Aureus (MRSA) Index
(January 2008 - April 2011)

Hospital A

Nosocomial Methicillin Resistant Staphylococcus Aureus (MRSA) Index is calculated as:

\[
\text{Hospital associated cases of MRSA} \times \frac{1}{1000}
\]

Identifying Special Cause Variation

Rules for Special Cause Variation

- Rule 1: A single data point beyond the 3SD Upper or Lower Control Limit
- Rule 2: A run of 8 points above or below the mean (99.7%)
- Rule 3: 2 out of 3 consecutive points beyond the 2SD Upper or Lower Warning Limit
- Rule 4: A run of 6+ points ascending or descending

Violation of Special Cause Rules - Months Requiring Review

- Rule 1: Sep-08
- Rule 2: Apr-08 to Dec-08, Jun-08 to Feb-10

The numerator and denominator and all exclusion criteria for each indicator will be on each report.
NSLIJ System Review
Raw Sepsis and Severe Sepsis/Septic Shock Mortality Rate
(January 2008 – May 2013)

Sepsis Task Force Guidelines issued (February 2009)
Focus on early identification & timely antibiotics in the ED (March 2011)
Six Sigma & Lean projects (April 2013)

Sepsis and Severe Sepsis/Septic Shock Discharges Based on the Following Secondary ICD9 Diagnosis Codes: 99591 (Sepsis) and 99592 (Severe Sepsis). 78662 (Septic Shock) is a subset of 99592 and is included in this report. Includes patients 18 and older.

Data Source: Hospital Billing System
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Data as of: September 23, 2013
North Shore - LIJ Health System
ICU and Non-ICU Central Line-Associated BSI
Standardized Infection Ratio (SIR) by Quarter, 2010Q1 - 2013Q2

Standardized Infection Ratios with 95% Confidence Intervals
ICU and Non-ICU Central Line-Associated BSI

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Lower than Expected Number of CLABSIs
No different than Expected Number of CLABSIs
Higher than Expected Number of CLABSIs

Note: When Observed number of CLABSIs=Expected number of CLABSIs SIR=1.0

The observed number of CLABSIs is "Lower than Expected Number of CLABSIs" if the confidence interval is completely below the red line (at 1.0).
The observed number of CLABSIs is "No different than Expected Number of CLABSIs" if the confidence interval touches the red line (at 1.0).
The observed number of CLABSIs is "Higher than Expected Number of CLABSIs" if the confidence interval is completely above the red line (at 1.0).
Textbooks by Krasnoff Faculty


Contact Information

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