Learning from Every Death:
Six Sigma Approach to Mortality Rate Reduction

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Six Sigma Approach to Mortality Rate Reduction

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This information is confidential and protected from disclosure by Minnesota Statute 145.61 et seq.
Intention of Presentation

- Why?
- History
- Quantitative analyses
- Improvements
- The future

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21st century American health care
Safety and quality not improving in proportion to resources invested
2005 - 2008

MORTALITY TRENDS

Subgroup Sizes: Min n=449 Max n=5217

This average is part of Counting the Fates.
“No one should ever suffer or die as a result of failures in our systems or processes of healthcare delivery.”

MCR Mortality Review Subcommittee, May 2007
Original Charge from Hospital Leadership

- To create a meaningful mechanism to review deaths at MCR hospitals:
  - Thorough understanding
  - Measurable
  - Improvable

- To identify and quantify unanticipated deaths

- To identify rate of adverse events in patients who die in MCR hospitals

- To classify and quantify system level changes which will improve mortality rate.
Evolution of “ideal” mortality review

Goal - no one ever suffers or dies as a result of systems and/or operations failure.

Ideal review

• MD review every death
  • Unit, division or department level
• RN review every death
• Consensus-driven
• Close loop on findings/recommendations
• Everyone learns
One of the tools that you have heard about is the trigger tool. When we review random cases, we have a rate of 72/1000... this is at the lower end of the range for hospitals in the US. When we segment out those patients who reviewers thought had possible preventable deaths, the rate was 3x our own benchmark.
Evolution through time

- M&M Tradition
- 100 death review – 2003
- 4th quarter review – 2005
- Continuous review – 4th quarter 2006
- MCA (100% cases reviewed) early 2009
- MCF (targeted reviews) later 2009
- MCHS review roll-out 2012
- Enterprise-wide integration
How the review process flows to completion
Primary Reviewers (MD and RN)

- Encompass the entire hospitalization
- Include pre-hospitalization information as available
- Identify possible system and process failures
- Identify possible instances when standard of care was not followed
  - Documentation, supervision, clinical guidelines, etc
- Identify possible delays in treatment or diagnosis
- Identify possible communication or documentation issues
Multidisciplinary Team Discussions

- Many brains are better than one
- Reviews are inherently subjective
  - Retrospective
  - Rely on documentation
- Clinical expertise
- Cultural understanding
- Consensus
- Classification of death
Overall Case Classification

- NOT related to preventability
- Consensus
- Options
  - Unanticipated death with opportunity for improvement
  - Anticipated death with opportunity for improvement
  - Anticipated death with NO opportunity for improvement
Information Recorded into the Registry

- Qualitative and quantitative
- Patient’s story
- Level of detail
  - Describe timelines of issue identified
  - Enough to remember for future presentation
  - Enough for leadership to understand concern
- Indicators
- Case classification
Morbidity and Mortality Council

- Integration of safety and quality leadership
- Integration of all safety data
- Strategic data analysis
- Thoughtful interpretation
- Integrated recommendations to practice leadership
INSTITUTIONAL LEARNING THROUGH STORIES AND ANALYTICS
Systems and Processes of Care (quantitative analysis, 2007)

- Most triage issues result in a FTR
  - RR 61.8 (95% CI 34 - 111)

- Primary causes of FTR and unanticipated death
  - Unrecognized septic and hypovolemic shock
  - Missed diagnosis

- Autopsy rate - 26%
  - cause of death determined by autopsy at least once per month
MORTALITY DATA ANALYTICS

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Omission vs. Commission
P-chart of % of deaths with issues identified

- Nursing sepsis education
- Wipe C-diff initiative
- Sepsis order set
- Admission office
- Airway management protocol
- Other localized efforts: official reads on outside films, consultant notification of patient condition change, NGT suction and chest tube inservices, DOM encouragement of RRT utilization

Data source: MRS Mortality Registry
MRS System Findings (20)

Narcotic-induced respiratory depression
postoperative
OSA

Failure-to-Rescue
Failure-to-Recognize
Septic shock
Hypovolemic shock
Mesenteric ischemia

Intensive care of unstable patients
Supervision

Huddle

ston,
JM
05-15-2006
Days between Events

Moving range SPC's

ANOVA analyses
Delayed Diagnosis
SEPSIS
Moving range SPC chart for days between sepsis diagnosis issues
RESUSCITATION
Days Between Resuscitation Events (one event per patient)
Moving range SPC chart for days between triage events
Oneway ANOVA of days between triage issues

Means (95% CI)
2009: 5.98 (4.1, 7.86)
2010: 8.33 (6.19, 10.48)
2011: 10.45 (7.39, 13.52)
SPC p-chart of MCR mortality rate
P - chart of % of deaths with issues identified

Data source: MRS Mortality Registry

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Culture of Safety

Personal Performance

Systems’ Issues

One or the other... or both?
The road to patient safety and high quality patient care runs through the performance of the hospital and the staff.
Multidisciplinary reviews identify multidisciplinary “issues” with practice

- Ongoing culture shift with issue identification
- Long gone are the days of “nurses’ jobs” or “physicians’ responsibilities”
- Physician involvement
- Integral part of how business is done
  - Leadership involvement
  - Leadership accountability
“I have always thought a good deal of Lincoln’s Gettysburg address. There’s a line in it which explains why we want to do this thing. It is ‘that these dead shall not have died in vain.’ We know how hard it is for those who have had the misfortune of deaths in their families, of deaths that might have been avoided. What better could we do than take young men and help them become proficient in the profession so as to prevent needless deaths?”

Foundation life goal. Dr. William J. Mayo, tells senators.
Hospitals need both stories and analytics to learn, advance, and save lives.

Thank you for your time and attention.