Leadership for Reliable Systems
August 21, 2006

The Quality Colloquium

The American Hospital Association
QUALITYCENTER™
A Leadership Resource for Advancing Quality and Patient Safety

Stephen R. Mayfield
Senior Vice President
smayfield@aha.org
Visualize Success:

*We Don’t all SEE the Same Thing*
Seeing Differently

• De Kalb, Illinois
• DeKalb, Georgia
Leaders Create the Vision and Set Direction

“Would you tell me please which way I ought to go from here?” asked Alice.

“That depends a good deal on where you want to get to,” said the cat.

“I don’t much care,” said Alice.

“Then it doesn’t matter which way you go,” said the cat.
Leaders Create Expectations

• Leaders -> Values -> Behaviors -> Culture -> Performance

Courtesy of Ann Rhoades
Leaders Must

• Eliminate Preventable Harm
• Develop Highly Reliable Systems
• Improve Outcomes Year-to-Year
• Reduce Costs of Care Year-to-Year
Unceasing Efforts to:

• Remove Waste
• Eliminate Defects
• Reduce Variability

“All work is a system, every system has processes and every process has waste and variability.”
Relentless Pursuit of Waste

• Public perception, the Camry Effect and Community Contribution
Figure 1. International Comparison of Spending on Health, 1980–2003

Average spending on health per capita ($US PPP*)

Total expenditures on health as percentage of GDP

* PPP = Purchasing power parity — an estimate of the exchange rate required to equalize the purchasing power of different currencies, given the prices of goods and services in the countries concerned.

Change in Cost of Insurance Premiums and Co-Pays
The Camry Effect
Other Approaches Exist

• Juran: “There is 30% waste in most healthcare processes”

• Dartmouth study: “Providers in Salt Lake are number one, if all providers emulated their efficiency CMS could save 30% in expenditures”.
Reliability and the Four Components of Care Delivery

- Patient Information
- Clinical Decision
- Care Process
- Patient Flow
We Need to SEE our Processes
Our Approach to Date is not Yielding Desired Rate of Change

• We have believed that –
• If we have enough of the right data –
• Analysis will indicate compelling need to change –
• Change will therefore occur
We need to *Learn* to see our processes in a different light
Reliability and the Four Components of Care Delivery

- Patient Information
- Clinical Decision
- Care Process
- Patient Flow
Systems of Care and Simple Metrics
Information -> Clinical Decisions -> Care Processes -> Patient Flow

Clinical Information System

Evidenced Based Medicine
Clinical Best Practices

Outcome Indicators
(LOS, Mortality, Infection, Readmits)

Process Measures
(Waste, SMR, Cycle Time Variances, etc.)

Patient Flow
Lean + Six Sigma = More Value

<table>
<thead>
<tr>
<th># Steps</th>
<th>± 3σ</th>
<th>± 4σ</th>
<th>± 5σ</th>
<th>± 6σ</th>
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<tr>
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<td>99.9767%</td>
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<td>7</td>
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<td>50.08%</td>
<td>93.96%</td>
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<tr>
<td>20</td>
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<td>88.29%</td>
<td>99.536%</td>
<td>99.9932%</td>
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<tr>
<td>40</td>
<td>6.29%</td>
<td>77.94%</td>
<td>99.074%</td>
<td>99.9864%</td>
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</table>

Lean Reduces non-value add steps

Six Sigma improves quality of value-add steps
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Cost of Poor Quality and Defects
The 8 Deadly Wastes

- Overproduction
- Waits/Delays
- Transport
- Process
- Movement
- Inventory
- Defects
- Underutilization
Hidden Waste Will Eat You Alive

Perceived Cost

Actual Cost
Laboratory Improvements: Six Sigma Methods
**Suppliers**
- Physicians

**Inputs**
- Orders
- Patient Specimen
- Phlebotomist
- Testing Personnel

**Process**
- See Below

**Outputs**
- Specimen Delivered

**Customers**
- Physicians
- Patients
- Lab Personnel

**Requirements**
- Timeliness
- Accuracy
- Matching
- Convenient
- Matching
- Matched Specimens
- Timely Delivery

**Order in O.C. LIS Label Generated**

**Phlebotomist travels to patient**

**Match Patient**

**Draw Sample**

**Transport Specimen to Laboratory**
High Level Phlebotomy Flow

Retrieve Order → Print Label → Travel to Patient → Collect Specimen → Deliver Specimen
Detailed Phlebotomy Flow
Data Collection

- Design instrument
- Develop plan
- Collect Information
- Found 3 Problems: Matching, Batching Attaching
Over 40 specific defects identified in 6 classes:

• Label defects (unlabeled, misplaced, wrong patient labels, misaligned, etc.)
• Patient ID band defects (improper matching, no label, wrong label, etc.)
• Unsuccessful draw (not first stick, second phlebotomist required)
• Unacceptable specimen/recollect (wrong tube, clotted, hemolyzed, insufficient quantity, contaminated, overfilled, etc.)
Surrounded by Defects!
Prevention – Appraisal – Failure:
Visible Defects and
Direct Costs are
The Tip of the Iceberg!
Defect Rate Driven to Zero!

Error Incidence for Patient Identification and Lab Draws
Improving Interventional Flow with Lean Six Sigma
SIPOC: Interventional Scheduling

### Suppliers
- Physicians

### Inputs
- Orders
- Patient Information
- Schedule Information
- Capacity
- Staffing

### Process
- Receive call from Physician for Interventional test
- Approve Test
- Contact ordering Physician, Schedule test
- Patient enters our “system” (Orders, Labs, H&P)

### Outputs
- Completed Procedure
- Specimen Obtained
- Results in System

### Customers
- Physician
- Patient
- Radiologist
- Pathology/Lab
- Nursing/I.P.
- Registration

### Requirements
- Convenient
- Accurate Results
- Timely On Demand
- Convenient
- Clear expectations
- Timely Results
- Results
- Previous Exam
- Good History
- Convenient Schedule
- H&P
- Accurate Scheduling
- Completed record
- Demographic info
- Payer info
- ICD 9

### Administer and complete test
Detailed Flow Chart
Data Collection

- Data Collection
  Observing the Process
Analysis

(3, 2)
Current Process vs. Delay
Effect of Inpatient inserted in Schedule

Anova: Single Factor

Of data where complete from Arrival Time to Finish Time which defines Y

SUMMARY

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<th>Groups</th>
<th>Count</th>
<th>Sum</th>
<th>Average</th>
<th>Variance</th>
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ANOVA

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<th>Source of Variation</th>
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<th>df</th>
<th>MS</th>
<th>F</th>
<th>P-value</th>
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<td>75047.059</td>
<td>16</td>
<td></td>
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</table>

F stat is greater than F crit so reject that means could be same
Sometimes the System Just Gets You
Costs of Poor Quality
Visible Defects and Hidden Costs

COPQ: Flow of Patients

Visible Direct Costs

$2,487,198

Delays

Lost Opportunities

Visible Costs

Increased Variability

Patient/Customer Dissatisfaction

Convert OP -> IP

Rework

Inconsistent Handoffs

Unreliable Information

Waste of Resources

Liability - Risk

Rework

Physician Dissatisfaction

Customized Work Arrounds

Lost Business

Hidden Costs
The 8 Deadly Wastes

- Overproduction
- Waits/Delays
- Transport
- Process
- Movement
- Inventory
- Defects
- Underutilization
One Hospital’s Approach:

Latent Costs
Identified Opportunities
Realized Gains
One Example of Latent Costs

<table>
<thead>
<tr>
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<th>Weight</th>
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<tbody>
<tr>
<td>Mortality</td>
<td>1</td>
<td>20</td>
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<tr>
<td>Length of Stay</td>
<td>1</td>
<td>10</td>
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<tr>
<td>CVC infections</td>
<td>3.6</td>
<td>5</td>
</tr>
<tr>
<td>VAP infections</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Med Safety Rate</td>
<td>1</td>
<td>20</td>
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<tr>
<td>*Readmit Rate</td>
<td>4.55</td>
<td>10</td>
</tr>
<tr>
<td>*Safety (falls)</td>
<td>0.37</td>
<td>10</td>
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<tr>
<td>*Returns to OR</td>
<td>1.19</td>
<td>10</td>
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<tr>
<td>Continuous Readiness Index</td>
<td>90</td>
<td>10</td>
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It Can Be done – One Example

Growth Pillar:
Latent Costs, Identified and Realized Gains

Latent
Identified
Realized

1Q04 2Q04 3Q04 4Q04 YTD

Millions of dollars

-$6,000,000 $4,000,000 $2,000,000 $0 $2,000,000 $4,000,000 $6,000,000 $8,000,000 $10,000,000 $12,000,000 $14,000,000 $16,000,000
Visualize Success:

We Need to SEE our Processes
Pursuing Excellence by
Improving Care and Increasing Affordability
Our Mission

• The AHA Quality Center™ is a resource of the AHA designed to help providers accelerate their quality improvement processes to achieve better outcomes for patients and improve organizational performance.

• In collaboration with leading quality improvement stakeholders, it provides access to leading practices, tools and resources that support providers to achieve better patient outcomes, improved operational performance, enhanced safety and increased satisfaction.
Increasing Pressure on Hospitals & Providers

- Need for accurate patient I.D. and Matching.
- Increasing numbers of older and more acute patients.
- Increased volumes through the E.D.
- Increasing incidence of HAI.
- Pay for Performance initiatives.
- Reduced reimbursements.
- Pressure for public reporting.

- Medication errors and harm.
- Patient falls.
- Poor handoffs.
- Delays, queues, bottlenecks.
- Incomplete information for decisions.
- Rework.
- Staffing and resources.
- Pressure to define and assess “Quality.”
The Quality Center will support the continuum of care:

- Improve throughput and reduce LOS.
- Reduce readmissions.
- Improve patient identification and matching.
- Reduce Healthcare associated infections (HAI).
- Improve medication safety.
- Reduce incidence of falls.
- Improve top clinical processes.
- Reduce mortality.
- Improve financial performance (C/Adj/DC).
Unceasing Efforts to:

- Remove Waste
- Eliminate Defects
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“All work is a system, every system has processes and every process has waste and variability.”
Some Wicked Questions

• What are we trying to accomplish with respect to our performance?
• What level of quality and safety are we pursuing?
• How do we measure it?
• How is our performance changing?
• What are we doing to improve it?
• What are our latent costs?
• What are our Costs of Poor Quality?
• How is the CFO involved?
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