Workshop Objectives

• Differentiate between Robust Process Improvement (RPI) and traditional approaches to healthcare quality improvement

• Understand the kinds of problems that can be addressed with checklists and other kinds of problems where Robust Process Improvement (RPI) is the best approach

• Identify why and how the cause of quality and safety problems vary among different healthcare settings and organizations
Memorial Hermann Healthcare System

**Fiscal Year Ended June 30, 2014**

- Total Hospitals: 12 (9 Acute, 2 Rehab, 1 Children's)
- Ambulatory Surgery Centers: 19
- Heart & Vascular Institutes: 3
- Imaging Centers: 23
- Breast Care Centers: 9
- Sports Medicine & Rehab Centers: 35
- Diagnostic Laboratories: 25
- Retirement/Nursing Center: 1
- Home Health Branches: 3
- Cancer Centers: 7

- Adjusted Admissions: 286,487
- Annual Emergency Visits: 509,615
- Annual Deliveries: 24,924
- Employees: 22,151
- Beds (acute licensed): 3,370
- Medical Staff Members: 6,611
- Physicians in Training: 1,034
- Annual Labor Cost: $1.703 billion
Becoming a High Reliability Healthcare System

• It’s the right thing to do … “First Do No Harm”

• Our current healthcare system is harming and killing patients at an unacceptable rate

• Accountability for transparent quality data

Hospital Safety 1966
### 2004 Public Reporting of Hospital Acquired Infections

<table>
<thead>
<tr>
<th>Type of Infection</th>
<th>Number</th>
<th>Average Payment</th>
<th>Average Length of Stay in Days</th>
<th>Percent Died</th>
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<tr>
<td>Surgical Site</td>
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<td>$24,223</td>
<td>13.1</td>
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<tr>
<td>Urinary Tract</td>
<td>1,379</td>
<td>$18,589</td>
<td>9.7</td>
<td>1.9</td>
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<tr>
<td>Pneumonia</td>
<td>948</td>
<td>$28,691</td>
<td>12.2</td>
<td>5.9</td>
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<tr>
<td>Bloodstream</td>
<td>528</td>
<td>$40,129</td>
<td>15.4</td>
<td>13.8</td>
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<tr>
<td>Multiple Infections</td>
<td>260</td>
<td>$71,325</td>
<td>23.9</td>
<td>11.9</td>
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<td><strong>Any of the Above Infections</strong></td>
<td><strong>3,357</strong></td>
<td><strong>$29,320</strong></td>
<td><strong>12.6</strong></td>
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<td><strong>Without an Infection</strong></td>
<td><strong>102,657</strong></td>
<td><strong>$8,319</strong></td>
<td><strong>3.4</strong></td>
<td><strong>0.7</strong></td>
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</table>

*Pennsylvania PHC4 2004*
2007 Wrong-Sided Brain Surgery - Rhode Island

Third wrong-sided brain surgery at R.I. hospital
Patient OK in 2 of the incidents; institution fined $50,000 after latest error

AP
Associated Press
updated 2 hours, 17 minutes ago

PROVIDENCE, R.I. - Rhode Island Hospital was fined $50,000 and reprimanded by the state Department of Health Monday after its third instance this year of a doctor performing brain surgery in the wrong side of a patient's head.

"We are extremely concerned about this continuing pattern," Director of Health David R. Gifford said in a written statement. "While the hospital has made improvements in the operating room, they have not extended these changes to the rest of the hospital."

2010 Medical Mistakes – OIG Medicare Chart Audit

• 1 in 7 Medicare patients (13.5%) experienced at least one serious harm event from medical care that prolonged the hospital stay, caused permanent harm, required life-sustaining intervention, or contributed to a patient's death.
• In 1 month, hospitalizated Medicare patients experienced harm from hospital care with the event contributing to death of approximately 15,000 patients (1.5%).

In 1 month, an estimated 134,000 hospitalized Medicare patients experienced harm from hospital care with the event contributing to death of approximately 15,000 patients (1.5%).

1 in 7 Medicare patients (13.5%) experienced at least one serious harm event from medical care that prolonged the hospital stay, caused permanent harm, required life-sustaining intervention, or contributed to a patient’s death.

**Question:** How many avoidable deaths occur in U.S. hospitals each year?

- 25,000
- 50,000
- 100,000
- 200,000

Equivalent to a fully-loaded Boeing 737 crashing every 7 hours.
“If healthcare was an airline…”

“If healthcare was an airline, only dedicated risk takers, thrill seekers and those tired of living would fly on it.”

*Patient Safety (2005)*
by Charles Vincent

What if These Kinds of Risks Weren’t an Option?
High Reliability Organizations

Commercial Aviation

Nuclear Aircraft Carriers

Air Traffic Control

USS Nimitz

Distinguished Visitors Cruise
December 10-11, 2004
Naval Aviation Mishaps

1950-1997

- 776 aircraft destroyed in 1954
- Angled decks
- Aviation Safety Center
- Naval Aviation Maintenance Program established in 1959 (NAMP)
- RAG concept initiated
- NATOPS Program initiated 1961
- Squadron Safety program
- System Safety
- Designated Aircraft
- ACT

Flight Incident Rate 1 in 175,000 Flight Ops

Year

0 10 20 30 40 50 60
39 aircraft destroyed in 1996

Naval Aviation Safety
Memorial Hermann’s Quality and Safety Journey
Transformation to a High Reliability Organization

August 14, 2006

A Call to Action on Patient Safety

Transfusion Errors
Serious Safety Events

Burning Platform
Moving the Memorial Hermann Healthcare System from Safety as a priority to Safety is our Core Value

Leadership behavioral expectations change when safety is the core value

Safety Culture Training

- **Step 1: Set Behavior Expectations**
  Define Safety Behaviors & Error Prevention Tools proven to help reduce human error

- **Step 2: Educate**
  Educate our staff and medical staff about the Safety Behaviors and Error Prevention Tools

- **Step 3: Reinforce & Build Accountability**
  Practice the Safety Behaviors and make them our personal work habits
MHHS Safety Culture Training

Hospital Training Complete

>20,000 Employees Trained

>4,000 Physicians Trained

>540 Safety Coaches Trained

>$18M Expense

Breakthroughs in Patient Safety Training
Self-Checking With STAR*  
(Stop, Think, Act, & Review)

* Jefferson Center for Character Education

"It sort of makes you stop & think, doesn't it?"

Self-Check  
with STAR  
(Stop, Think, Act, & Review)

“Good for Her”

Edna Coutts, RN  
Sugar Land Hospital Safety Champion of the Month  
2007
Support Each Other: CUSS Words

- I am Concerned
- I am Uncomfortable
- This is for Safety
- Stand up and Stand Together

Red Rules Absolute Compliance

1. Patient Identification
2. Time Out
3. Two Provider Check
Acute Hemolytic Transfusion Reactions

Hospital Acquired Conditions
“Never Events”

Transfusion Events Jan 2007 - June 2014

1,845,000 Adjusted Admissions
9,991,000 Adjusted Pt Days
954,500 Transfusions

Zero
Leadership – An Evolution in Perspective

“If you do the things you’ve always done, you’ll get the results you’ve always gotten.”

From…

<table>
<thead>
<tr>
<th>Externally driven safety focus (e.g. Joint Commission, CMS)</th>
<th>Internally driven safety focus</th>
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<td>Safety is a priority</td>
<td>Safety is a core value that cannot be compromised</td>
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<tr>
<td>We are creating a safety culture</td>
<td>We are shaping a reliability culture that creates safety</td>
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<td>The board and senior leader support culture change</td>
<td>The board and senior leaders own and manage the culture</td>
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<tr>
<td>Medical staff support culture change</td>
<td>Medical staff own and promote safety culture</td>
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To…

MHMD Clinical Programs Committee & Subcommittees

MHMD Board of Directors

Clinical Programs Committee

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<tr>
<th>H&amp;V</th>
<th>Neuro</th>
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<td>Peer Review</td>
<td>Clinical Ethics &amp; Palliative Care</td>
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Physician Self Governance Across the System

• Clinical Programs Subcommittee(s) develop safety and quality guidelines

• Guidelines presented to Full Clinical Programs Committee for approval

• However, 11 MECs have to approve guidelines to be enforceable at hospitals

“Up and Over”
**ICU Safe Practice Guideline:** To prevent injury to adjacent organs when central lines are inserted, the following practice guideline is recommended:

- Real-time ultrasound guidance will be used for placement of all central venous catheters, whenever possible.
- Physicians and other individuals placing central lines under real-time ultrasound guidance will receive appropriate training in the use of ultrasound for this purpose.

**MEC Up or Down Vote**

A series of adverse events and close calls due to respiratory depression have occurred across the system in early postoperative patients receiving PCA therapy. These patients are at increased risk due to the residual effects of anesthesia and binding medications received in the OR and PACU, when combined with postoperative PCA variances. In response to these events and after complete discussion with multiple CPC subcommittees, the CPC and the MHMD Board approved a new updated standard to monitor postoperative PCA patients with continuous pulse oximetry for 24 hours after surgery. This standard was approved by the System Quality Committee on November 16.

To facilitate compliance, the CPC and subcommittees have changed the standard postoperative PCA for patients to require 24 hours of continuous pulse oximetry monitoring in a difficult choice.

Hospital MECs and MEC committees should review this new safety standard carefully. It is our recommendation that this standard be addressed by a formal vote of the MEC if it is applicable to your facility, unless already adopted. Individual hospital monitoring standards may be more stringent than this, but not less stringent. Please feel free to contact us for any questions.
### 2011 Safety & Quality Guidelines

<table>
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<th>OB Safety Program</th>
<th>SCIP &amp; DVT Prophylaxis</th>
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### Nov 2013 Safety & Quality Guidelines

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<th>Joint Replace Checklist</th>
<th>Cardiac Surgery Team</th>
<th>Cardiac Surg Abx Redosing</th>
<th>Heme-Onc Blood Cult Policy</th>
<th>Revised ED OB Triage Policy</th>
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Maternal Mortality

2011 Mandatory OB Physician & Nurse APS Training

MHHS Maternal Mortality Rate
25,000 Deliveries/Year

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th># Maternal Deaths</th>
<th>Rate/100,000 Live Births</th>
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<tr>
<td>2013</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td>2014</td>
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</table>

22 hours - initial training
6 hours/year - ongoing

Joint Commission Center for Transforming Healthcare

The Joint Commission’s Center for Transforming Healthcare aims to solve healthcare’s most critical safety and quality problems. The Center’s participants -- the nation’s leading hospitals and health systems -- use a proven, systematic approach to analyze specific breakdowns in patient care and discover their underlying causes to develop targeted solutions that solve these complex problems. In keeping with its objective to transform health care into a high reliability industry, the Joint Commission will share these proven effective solutions with the more than 16,000 health care organizations it accredits.

Bringing the Leading Health Care Organizations Together to Solve Challenging Health Care Problems

- Cedars-Sinai Health System
- Emory Healthcare
- Panettone Hospital
- Memorial Hermann Healthcare System
- Johns Hopkins Hospital and Health System
- Trinity Health
- Virtua
- Wake Forest University Baptist Medical Center

How Will We Get There?

- Change Management
- Lean Six Sigma
- High Reliability
- Memorable Success
- Targeted Solutions
- Industry Engagement
- Sustainability
**Joint Commission Hand Hygiene**

CTH - Robust Process Improvement

- **Baseline Compliance**: 44%
- **>90% Dec 2012**
- **Higher Is Better**

---

**Adult ICU Central Line Associated Blood Stream Infections (CLABSI)**

- **CLABSI Rate per 1K Line Days**
- **System Adult ICU CLABSI**
- **Do No Harm**
- **Central Line Associated Blood Stream Infections**

![Graph showing CLABSI rates over time with control limits and trend lines](image)

- **UCL = 9.42**
- **Mean = 5.53**
- **LCL = 1.64**
- **UCL = 5.13**
- **Mean = 2.52**
- **LCL = 0.38**
- **UCL = 2.55**
- **Mean = 1.17**
- **LCL = 0.38**

February CLABSI rates not available due to ISD technical difficulties.
**NICU Central Line Associated Blood Stream Infections (CLABSI)**

- **UCL** = 18.18
- **LCL** = 4.74
- **Mean** = 11.96
- **UCL** = 19.19
- **Mean** = 3.45
- **UCL** = 8.62

**Hand Hygiene**

**Adult Ventilator Associated Pneumonias (VAP)**

- **UCL** = 4.44
- **4**
- **UCL** = 0.82
- **UCL** = 1.0
- **UCL** = 0.87

**TJC CTH**

- **Hand Hygiene**
Central Line Associated Bloodstream Infections
Ventilator Associated Pneumonias
Surgical Site Infections
Retained Foreign Bodies
Iatrogenic Pneumothorax
Accidental Punctures and Lacerations
Pressure Ulcers Stages III & IV
Hospital Associated Injuries
Deep Vein Thrombosis and/or Pulmonary Embolism
Deaths Among Surgical Inpatients with Serious Treatable Complications
Birth Traumas
Serious Safety Events
Central Line Associated Bloodstream Infections
Ventilator Associated Pneumonias
Surgical Site Infections
Retained Foreign Bodies
Iatrogenic Pneumothorax
Accidental Punctures and Lacerations
Pressure Ulcers Stages III & IV
Hospital Associated Injuries
Deep Vein Thrombosis and/or Pulmonary Embolism
Deaths Among Surgical Inpatients with Serious Treatable Complications
Birth Traumas
Serious Safety Events

Patient Safety Indicator
*iatrogenic Pneumothorax*

Subclavian Vein “Stick”
Landmark Method

Central Line Associated Iatrogenic Pneumothorax
Patient Safety Indicator
iatrogenic Pneumothorax

Central Line Associated Iatrogenic Pneumothorax

Bedside Real Time Ultrasound Guidance

MH Southeast Hospital
iatrogenic Pneumothorax

MH Southeast Hospital
Southeast Adult Iatrogenic Pneumothorax
Do Not Harm
Rate/1000 Discharges for Secondary Diagnosis

2009 2010 2011

Reporting Months

produced by System Quality and Patient Safety
MH Southeast Hospital
Iatrogenic Pneumothorax

MH Southeast Hospital

MH Southeast Hospital
Iatrogenic Pneumothorax

MH Southeast Hospital

22 Months
Zero Iatrogenic Pneumothorax
MH Southeast Hospital
Real Time Ultrasound Guidance

Driver Graph:
Real-Time Ultrasound Guidance for Central Line Insertion

MH Southeast Hospital
Iatrogenic Pneumothorax

New Award

MH Southeast Hospital
Zero Iatrogenic Pneumothorax
High Reliability Certified Zero Award
To: Memorial Hermann Southeast Hospital
Zero iatrogenic Pneumothorax for 12 Months
February 1, 2010 to January 31, 2011

Dan Wallerstein
President & Chief Executive Officer

M. Michael Shubert, M.D.
System Chief Medical Officer

Robert G. Crewe
Chair, Health System Board
High Reliability Certified Zero Award

1. Zero Events

2. 12 Consecutive Months

3. Certified Zero Category

MH Northwest: Zero Retained Foreign Bodies

Zero Retained Foreign Bodies x 48 Months
MH Katy: Zero Central Line Blood Stream Infections Hospital-Wide

MH Woodlands: Zero Ventilator Associated Pneumonias
MH Katy: Zero Pressure Ulcers Stages 3 & 4

MH Woodlands: Zero Hospital Acquired Injuries
High Reliability Certified Zero Award

To: Memorial Hermann Northeast Hospital
Zero Early Elective Deliveries for 12 months
January 2013 to December 2013

Dan Wallerstein
President & Chief Executive Officer
System Chief Medical Officer

Will Williams
Chief, Health System Board

2014

High Reliability Certified Zero Award

To: Memorial Hermann Northwest Hospital
Zero Serious Safety Events 1 & 2 for 12 months
January 2013 to December 2013

Dan Wallerstein
President & Chief Executive Officer
System Chief Medical Officer

Will Williams
Chief, Health System Board
High Reliability 2011-14 Certified Zero Awards

**ICU Central Line Associated Bloodstream Infections (13)**
**Hospital-Wide Central Line Associated Bloodstream Infections (3)**
**Ventilator Associated Pneumonias (23)**
**Surgical Site Infections**
**Retained Foreign Bodies (31)**
**Iatrogenic Pneumothorax (15)**
**Accidental Punctures and Lacerations (3)**
**Pressure Ulcers Stages III & IV (21)**
**Hospital Associated Injuries (5)**
**Deep Vein Thrombosis and/or Pulmonary Embolism**
**Deaths Among Surgical Inpatients with Serious Treatable Complications**
**Birth Traumas (11)**
**Serious Safety Events 1&2 (8)**
**All Serious Safety Events (1)**
**Early Elective Deliveries (1)**

<table>
<thead>
<tr>
<th>Award</th>
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<tr>
<td>ICU Central Line Associated Bloodstream Infections</td>
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**Total** | 135
HAI “Clean Sweeps”

**Memorial Hermann Southeast Hospital – November 2013**

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**MH Katy Hospital – December 2013**

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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MRSA</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Does All This Make A Difference at Memorial Hermann?**
John M. Eisenberg Patient Safety and Quality Award

March 8, 2013 | Washington, DC

The Joint Commission
National Quality Forum

Safety/Quality Leadership

15 Top Health Systems; Top 5 Large Health Systems (2012 & 2013)


National Quality Forum National Quality Healthcare Award (2009)

Joint Commission-NOF John M. Eisenberg National Patient Safety & Quality Award (2012)

Texas Hospital Association Bill Aston Quality Award (2011)

101 Top Health Systems; Top 5 Large Health Systems (2012 & 2013)

America’s #1 Quality Hospital for Overall Care (2011, 2012 & 2013)

The Joint Commission Top Performer (2012 & 2013) Heart Attack, Heart Failure, Pneumonia, Surg Care (8 hospitals 2013)

HealthGrades®
- Distinguished Hospital for Clinical Excellence (2011, 2012 & 2013)

2011 Texas Healthcare Foundation Quality Improvement Awards (9 Memorial Hermann Campuses)
Memorial Hermann Accountable Care

Memorial Hermann ACO

- Clinically Integrated IPA
- Private, Employed & Faculty Integration
- Exclusive Contracting DOJ/FTC Protections

CMS Shared Savings:
- 40,000 attributed beneficiaries
- Focused around Patient Centered Medical Homes (PCMHs)

Medicare Advantage:
- 18,000 covered lives

Commercial:
- 240,000 covered lives
- BCBS, Aetna, Humana

Year 1 CMS Shared Savings Results:
- 34,000 attributed beneficiaries
- $57,800,000 Savings
  (#1 Highest Savings ACO in the US)
Healthcare as a High Reliability Organization

A new standard

Aim for safety of planes, nuclear plants

Everyone accounts on high-reliability organizations to ensure that safety when flying on commercial airlines or traveling on nuclear power plants, air traffic centers, nuclear reactors, nuclear rocket centers and conclusion all have well-deserved reputations for high-reliability operations.

But can hospitals be evaluated in the same voice to be so, beginning with the Institute of Medicine’s 2002 publication of "To Err Is Human" and continuing to the 2010 report by JPS inspector general’s office that 13.9% of Medicare beneficiaries suffer preventable adverse events during hospitalization.

In 2008, the Memorial Hermann Healthcare System in Houston embarks on a quest to become an HRQO. The high-reliability goal is a key element of this move implemented in all internal-care units and operating rooms. Memorial Hermann worked with the Joint Commission’s Center for Transforming Healthcare to reduce unscheduled cardiac surgeries.

In 2010, the success of this initiative became apparent. Zero cases of hospital-acquired infection (HAI) occurred from January 2012 to present among a population of 80,000 adjusted admissions. 136 million days of care and nearly 800,000 transfusions. Several hospitals had gone for years without a preventable adverse event.

Some hospitals have moved forward to new root causes while creating a million dollars for each month of being delivered. Many of our hospitals have gone a full year without the occurrence of a particular HAI, PIP, or HMC.
High Reliability Organizations

Memorial Hermann Health System

Air Traffic Control

Nuclear Aircraft Carriers

Thank you!

“You must be the change you want to see in the world”

Mahatma Gandhi (1869-1948)
A Better Way to Do Improvement

Mark R. Chassin, MD, FACP, MPP, MPH
President, The Joint Commission

Institute for Healthcare Improvement
26th Annual Forum
Orlando, FL
December 9, 2014

Current State of Quality

Routine safety processes fail routinely
• Hand hygiene
• Medication administration
• Patient identification
• Communication in transitions of care

Uncommon, preventable adverse events
• Surgery on wrong patient or body part
• Fires in ORs, retained foreign objects
• Infant abductions, inpatient suicides
Current State of Improvement

We have made some progress
• Project by project: leads to “project fatigue”
• Satisfied with modest improvement

Current approach is not good enough
• Improvement difficult to sustain/spread
• Getting to zero, staying there is very rare

High reliability offers a different approach
• High reliability is not a project
• The goal is much more ambitious

High Reliability Healthcare

Our team has learned by working with academics, experts from HROs in many fields (nuclear, aviation, military, amusement)

We have created a model for healthcare
• Leadership, safety culture, RPI
• New resources, tools, and strategies

Mini-course on high reliability yesterday

Some hospitals and systems are beginning to commit to the goal, demonstrating results
Robust Process Improvement

- Systematic approach to problem solving: (RPI = lean, six sigma, change management)
- The Joint Commission has adopted RPI
  - Improve processes and transform culture
  - Focus on our customers, increase value
- The Joint Commission is adopting all components of safety culture
- We measure RPI and safety culture and report on strategic metrics to Board

What is Lean?

- **Philosophy**: continuous improvement of processes through employee empowerment
- Teaches us to view our processes from the customer’s perspective—in value streams
- **Tools**: to increase value by eliminating steps in processes that represent pure waste
- Waste increases cost, produces no value
- All unexamined processes have waste; often as much as 50% of time and effort is waste
Lean Fundamentals

Process Improvement Using Lean

Before

After

Work Time (value added)

Waiting and other non-value added time

Same value, Less time, lower cost

Business Improvement = Eliminate waste + Eliminate defects → Lean → Six Sigma

Six Sigma Uses “DMAIC”
A Methodology for Improving Processes

Define
Who are the customers? What is critical to the quality of the process?

Measure
How can we measure exactly how well the process is performing?

Analyze
What are the most important causes of the defects?

Improve
How do we remove the causes of the defects?

Control
How can we maintain the improvement?
### Six Sigma Quality

<table>
<thead>
<tr>
<th>Sigma level</th>
<th>Percent</th>
<th>“DPMO”</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>0.00034</td>
<td>3.4</td>
</tr>
<tr>
<td>5</td>
<td>0.023</td>
<td>230</td>
</tr>
<tr>
<td>4</td>
<td>0.62</td>
<td>6,200</td>
</tr>
<tr>
<td>3.8</td>
<td>1.0</td>
<td>10,000</td>
</tr>
<tr>
<td>3</td>
<td>6.7</td>
<td>67,000</td>
</tr>
<tr>
<td>2</td>
<td>31.0</td>
<td>310,000</td>
</tr>
</tbody>
</table>

---

### The Technical Solution is Not Enough

- Lean, six sigma provide technical solutions
- Why does improvement fail so often?
  - Not for lack of a good technical solution
  - Failures occur when organization fails to accept and implement a good solution it had
- RPI addresses this challenge directly
- Change management = a systematic way to implement and sustain good solutions
How to Sustain Improvement

Managing change is integral and must be explicitly included in improvement

\[ E = Q \times A_1 \times A_2 \]

Effectiveness (E) =

Technical quality (Q) x
Acceptance (A_1) x
Accountability (A_2)

Facilitating Change

Key components of managing change

1. **Plan**: engage all stakeholders, identify sponsor, champion and process owner
2. **Inspire**: paint a convincing picture of how the change will be beneficial
3. **Launch**: initiate the change, intensify communication to stakeholders
4. **Support**: sustain the improvement; empower process owner

Change management is not linear
RPI in Health Care Today

- Only a small percentage of hospitals or systems use RPI in any form or fashion.
- RPI is used differently by different hospitals:
  - Most use only some of the parts.
  - Most do not use it to transform.
  - Most do not have a plan for spread.
  - Most do not link RPI training to staff development or advancement.

Compelling business case for RPI.

The Business Case

- Administrative processes in health care are just as broken as clinical processes:
  - Billing, supply chain, throughput.
  - RPI can directly improve margins.
- Quality improvements often don’t save $$.
- Learning RPI allows organizations to solve their own problems, eliminate consultants.
- Generate positive ROI now while learning how to redesign care processes for future.
- Mayo program ROI = 5:1.

Training and Deployment

We have a large group of experts in lean, six sigma, and change management (RPI)
  • Studied experience of major corporations (for example, GE, Lilly, BD, Cardinal)
  • Extensive experience with 27 hospitals and systems applying RPI tools

We are training hospitals and systems to:
  • Get the most out of RPI tools and methods
  • Embed RPI throughout their organizations

Center for Transforming Healthcare

www.centerfortransforminghealthcare.org
Center for Transforming Healthcare

Using RPI together with leading US hospitals and health systems to solve most difficult quality and safety problems

- Project topics:
  - **2009-10**: hand hygiene, wrong site surgery, hand-off communications, SSIs
  - **2011**: safety culture, preventable HF hospitalizations, and falls with injury
  - **2012**: sepsis mortality, insulin safety
  - **2013-4**: C. difficile prevention, VTE

### Participating Hospitals

- Atlantic Health
- Barnes-Jewish
- Baylor
- Cedars-Sinai
- Cleveland Clinic
- Exempla
- Fairview
- Floyd Medical Center
- Froedtert
- Intermountain
- Johns Hopkins
- Kaiser-Permanente
- Mayo Clinic
- Memorial Hermann
- New York-Presbyterian
- North Shore-LIJ
- Northwestern
- OSF
- Partners HealthCare
- Sharp Healthcare
- Stanford Hospital
- Texas Health Resources
- Trinity Health
- VA Healthcare System-CT
- Virtua
- Wake Forest Baptist
- Wentworth-Douglass
Current State of Quality

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- Infant abductions, inpatient suicides

The Way We Do Improvement

Usual approach: best practices, toolkits, protocols, checklists, “bundles”
- Typical best practice is “one-size-fits-all”
- Can produce modest improvement
- Difficult to sustain
- Cannot get to zero this way

The “one-size-fits-all” approach works well only for simple problems that do not vary
Toughest problems are not simple
RPI is Delivering Results

Complex processes require more sophisticated problem-solving methods

Three crucial and consistent findings:
- Many causes of the same problem
- Each cause requires a different strategy
- Key causes differ from place to place

RPI = lean, six sigma, change management
- Producing next generation best practices
- Solutions customized to your causes

Semmelweis’ Original Data

Monthly Death Rates

Handwashing Program

1841 1842 1843 1844 1845 1846 1847 1848
Some Important Causes of Hand Hygiene Failures

1. Faulty data on performance
2. Inconvenient location of sinks or hand gel dispensers
3. Hands full
4. Ineffective education of caregivers
5. Lack of accountability

➤ Each requires a very different strategy to eliminate

Causes Differ by Hospital

<table>
<thead>
<tr>
<th>Main Causes of Failure to Clean Hands (across all participating hospitals)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ineffective placement of dispensers or sinks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand hygiene compliance data are not collected or reported accurately or frequently</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lack of accountability and just-in-time coaching</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety culture does not stress hand hygiene at all levels</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ineffective or insufficient education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hands full</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wearing gloves intertwines with process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perception that hand hygiene is not needed if wearing gloves</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health care workers forget</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distractions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Each letter = one hospital

Note: not all of the main causes of failure appear in every hospital. The chart above represents the validation of the root causes across hospitals. This underscores the importance of understanding hospital-specific root causes so that appropriate solutions can be targeted.
Wrong Site Surgery

Joint Commission Universal Protocol 2003: a simple, one-size-fits-all best practice

Today: 40 per week in US

High rates of risks introduced in 3 areas:

- **Scheduling**: 39% of cases had risks
- **Pre-op area**: 52% of cases had risks; 25% with multiple risks
- **OR**: 59% of cases had risks; 32% with multiple risks

Causes Differ By Organization

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booking documents not verified by office schedulers</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Schedulers accept verbal requests for surgical bookings instead of written documents</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Unapproved abbreviations, cross-outs, and illegible handwriting used on booking form</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Missing consent, history and physical, or surgeon’s orders at time of booking</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Primary documents (consent, history and physical, surgeon’s booking orders, operating room schedule) missing, inconsistent or incorrect</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Paperwork problems identified in pre-op but resolved in a different location</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Inconsistent use of site marking protocol</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Someone other than surgeon marks site</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Surgeon does not mark site in pre-op/holding</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Site mark made with non-approved surgical site marker</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Stickers used in lieu of marking the skin</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Inconsistent site marks used by physicians</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Inconsistent or absent Time Out process for regional blocks</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Rushing during patient verification</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Alternate site marking process does not exist or is not used</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Inadequate patient verification by team</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>
Results are Consistent

More sophisticated improvement methods (RPI) required for complex problems

- Measure and discover specific causes
- Identify how causes vary among different organizations and settings
- Target interventions to specific causes to maximize effectiveness
- Avoid wasting resources by targeting

This is the Center’s unique capability

RPI Drives Major Improvements

<table>
<thead>
<tr>
<th>Center Projects</th>
<th>Results(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand hygiene</td>
<td>71↑</td>
</tr>
<tr>
<td>Hand-off communication failures</td>
<td>56↓</td>
</tr>
<tr>
<td>Wrong site surgery risks</td>
<td></td>
</tr>
<tr>
<td>• Scheduling</td>
<td>46↓</td>
</tr>
<tr>
<td>• Pre-op</td>
<td>63↓</td>
</tr>
<tr>
<td>• Operating Room</td>
<td>51↓</td>
</tr>
<tr>
<td>Colorectal SSIs</td>
<td>32↓</td>
</tr>
<tr>
<td>Falls with injury</td>
<td>62↓</td>
</tr>
</tbody>
</table>
Targeted Solutions Tool (TST)

Web-based tools: secure extranet channel
- Available to all accredited customers now
- No added cost, voluntary, confidential
- Educational, no jargon, no special training
- Coaches available to guide users to solutions
- Targeting only your causes means you don’t use resources where they aren’t needed
- 2010: hand hygiene; 2012: wrong site surgery and hand-off communication; 2015: falls
### Hand Hygiene TST: 3 Years

- 849 projects are using interventions
  - **Baseline** = 58% (n = 110,255) *
  - **Improve** = 84% (n = 584,025) *

<table>
<thead>
<tr>
<th>Unit</th>
<th>Baseline</th>
<th>Improve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult critical care</td>
<td>62%</td>
<td>80%</td>
</tr>
<tr>
<td>Emergency dept.</td>
<td>51%</td>
<td>80%</td>
</tr>
<tr>
<td>Adult med-surg</td>
<td>51%</td>
<td>84%</td>
</tr>
<tr>
<td>Long term care</td>
<td>61%</td>
<td>86%</td>
</tr>
</tbody>
</table>

- 20% have improved to greater than 90%

* *p* < 0.0001

### Impact of Hand Hygiene TST on Typical US Hospital

**TST improves HH, reduces HAIs by 35%**

<table>
<thead>
<tr>
<th>Beds</th>
<th>Expect HAIs/yr</th>
<th>Annual impact:</th>
<th>Annual impact:</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>555</td>
<td>194 fewer HAIs</td>
<td>388 fewer HAIs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12 lives saved</td>
<td>24 lives saved</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$3.7M cost avoided</td>
<td>$7.5M cost avoided</td>
</tr>
<tr>
<td>600</td>
<td>1100</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Used TST to achieve >95% hand hygiene compliance

Bloodstream infections fell by 2/3

C. Difficile Rate Declines as Hand Hygiene Improves
MRSA Rate Decreases as Hand Hygiene Improves

Hand Hygiene Compliance (%)

MRSA Cases (per 1000 patient days)

Joint Commission, RPI and High Reliability

- We must have much more ambitious goals for healthcare improvement: zero harm
- Current methods will not get us there
- Lean, six sigma, and change management (RPI) have far greater promise
- Culture change is difficult, takes time
- Some hospitals and systems making real progress; showing that zero is achievable
- Joint Commission has tools to help