High Reliability and Robust Process Improvement

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

July 26, 2016

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3000 patients over 6 years

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Operating-Room Fire at Hospital Burns Patient, Prompts Changes

Story | Comments (26) | Image (3) | Print | Font Size:

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Posted: Friday, August 9, 2013 11:45 am | *Updated: 12:17 pm, Mon Aug 12, 2013.*

Ted M. Natt Jr., staff writer | 26 comments

FirstHealth of the Carolinas officials should know by the end of the month whether they have taken adequate corrective steps to prevent operating room fires like the one recently that burned the neck and shoulders of a patient during an emergency surgery at Moore Regional Hospital.

The N.C. Division of Health Service Regulation placed Moore Regional on "immediate jeopardy" status following an

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'You're taking out wrong kidney, surgeon was told'

by CLARE KITCHEN, Daily Mail

Comments (0) | Share

A surgeon accused of killing a patient by taking out the wrong kidney was warned he was making a mistake by a medical student watching the operation, a court heard yesterday.

Dr Mahesh Goel dismissed the concerns of student Victoria Fern and pressed on with the surgery, it was said.

Goel and consultant urologist John Roberts are accused of manslaughter over the 'appalling error' which left 70-year-old Graham Reeves with one diseased kidney.

The Korean War veteran died five weeks after the botched operation.

Roberts, 59, and Goel, 39, had shown a level of care far below that which is expected of competent surgeons, prosecutor Leighton Davies QC said.

'It was a drastic surgical error described by Mr Roberts himself in the aftermath as the worst thing he had done in his life,' said Mr Davies. 'He says it was an appalling error.'

Mr Reeves, who was single, was due to have his damaged right kidney removed. But the surgeons removed his left kidney and before the mistake was realised it was put in a jar of acidic sterilising agent.

'The right kidney was diseased for years and non-functioning,' Mr Davies told Cardiff Crown Court.

'The operation played a significant part in causing his death. It deserves to be condemned as gross negligence and therefore a crime.'

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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

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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
  - The goal is much more ambitious
  - High reliability is not a project

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High Reliability Healthcare

- Our team has worked for 7 years with academics and experts from HROs (nuclear, aviation, military, amusement parks)
- We have created a model for healthcare:
  - Leadership committed to goal of zero harm
  - Safety culture embedded throughout
  - RPI (lean, six sigma, change management)
- Everyone's job is protecting patients
- New resources, tools, and programs

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RPI and High Reliability

- How did HROs achieve zero harm?
  - How to get from low to high reliability?
  - No guidance from the academics
- How do we address safety processes that fail 40-60% of the time?
- How to get major improvement quickly?
- Answer?

RPI = lean, six sigma, and change management

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Robust Process Improvement

- Systematic approach to problem solving
- The Joint Commission has fully adopted RPI
  - Intense customer focus, increase value
  - Goal is to train everyone
  - RPI is “the way we work”
- The Joint Commission is adopting all components of safety culture
- We measure RPI and safety culture and report on strategic metrics to Board

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Quality Progress
Cover Story
June 2016

The Joint Commission

CULTURE OF QUALITY

How We Work

Process improvement program **breeds quality culture,** empowers staff

by Tyler Gaskill, assistant editor

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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

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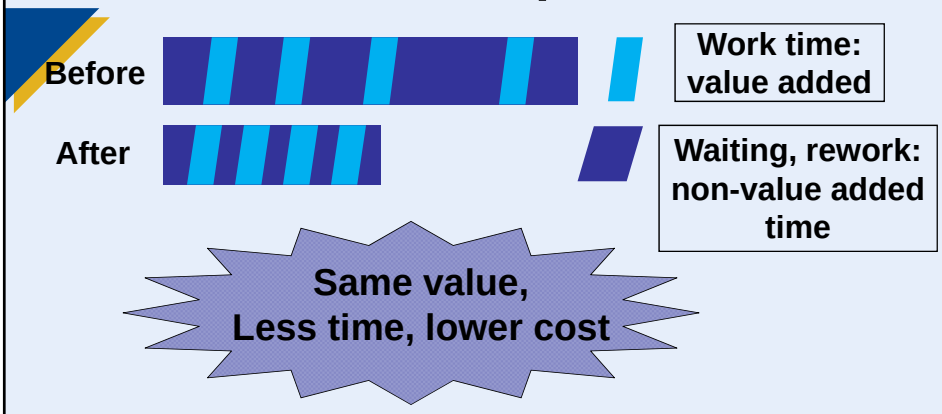
Lean Process Improvement



Business Improvement = Eliminate Waste → Lean + Improve Outcomes → Six Sigma

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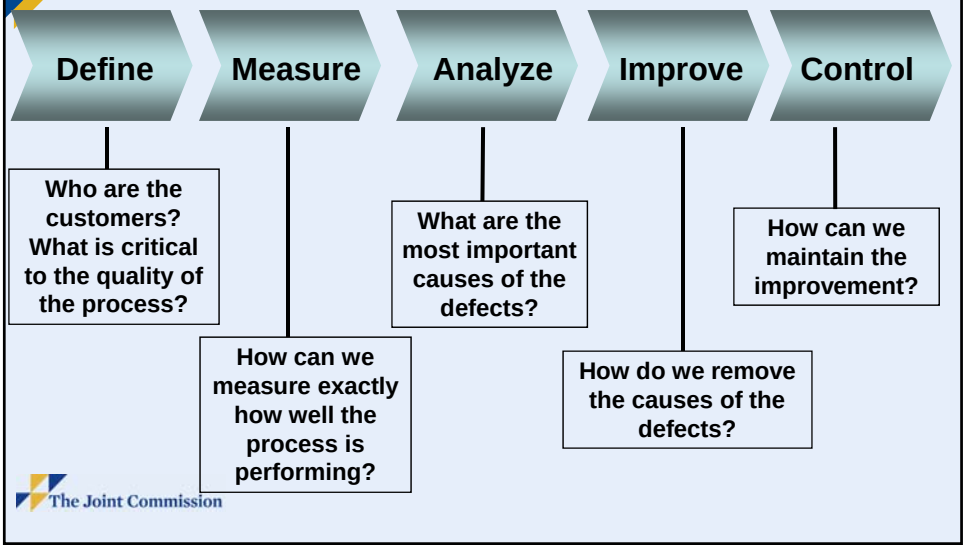
Six Sigma Uses "DMAIC"

To Improve the Outcomes of Processes



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Six Sigma Philosophy

- Philosophy underlying six sigma helps us to think about quality differently
- Six sigma measures bad outcomes as "defects per million opportunities"
- 1% rate of bad outcomes =

  10,000 defects per million
- Six sigma = 3.4 defects per million
- It gives us tools and a way to think about getting to zero harm: the high reliability goal

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How Safe are US Airlines?

- 1990-2001
  - 129 deaths per year
  - 9.3 million flights per year
  - Rate = 13.9 deaths per million flights
- 2002-2013
  - 14.6 deaths per year
  - 10.2 million flights per year
  - Rate = 1.43 deaths per million flights

= 90%↓

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Technical Solution is Not Enough

- Lean, six sigma provide technical solutions to standardize markedly improved processes
- 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

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Technical Solution is Not Enough

- Lean, six sigma provide technical solutions to
- W
  -
  -
- RP
- Change management = a systematic way to implement and sustain good solutions

Change management is the rocket science of improvement

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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 beneficial the change will be
  3. Launch: initiate the change, intensify communication to stakeholders
  4. Support: sustain the improvement; empower process owner
- Change management is not linear

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Getting Started

- Identify all the relevant stakeholders
- "ARMI" analysis
  - Approvers
  - Resources
  - Members
  - Interested parties
- Different roles at different phases of change
- Revisit periodically during change process

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Resistance to Change

- Managing resistance is critical to success
  - "Resistance Analysis" is a vital tool
  - Who is likely to resist and why?
- Sources of resistance
  - Technical
  - Political
  - Cultural
- Each requires a different strategy to overcome

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Engaging Stakeholders

- "Attitude/Influence Matrix"
  - Assess attitudes of key stakeholders (support or oppose the change)
  - Which individuals can influence the attitude of those who are opposed?
- Works to build support, overcome resistance
- Requires continuous attention during project as attitudes typically change over time
- Opponents, if converted, are best advocates

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RPI in Health Care Today

- RPI routinely produces 50%+ improvement
- 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; change management is most often left out
  - Most do not use it to transform
  - Most limit training to small group
- Compelling business case for RPI

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The Business Case

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

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J Patient Safety 2013;9(1):44-52

RPI Solves Revenue Cycle Problems

- Mount Sinai: RPI uncovered significant problems billing for cardiac stents, pacemakers and implantable defibrillators
  - Complex process involving cardiology, IT, finance, faculty practice, nursing
  - 63% error rate----reduced to 5.6%
  - $5M increase in annual revenue
- Mount Sinai: RPI solved longstanding chemoRx billing issues: $1.7M ↑ revenue

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MSJM 2008;75:45-52

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

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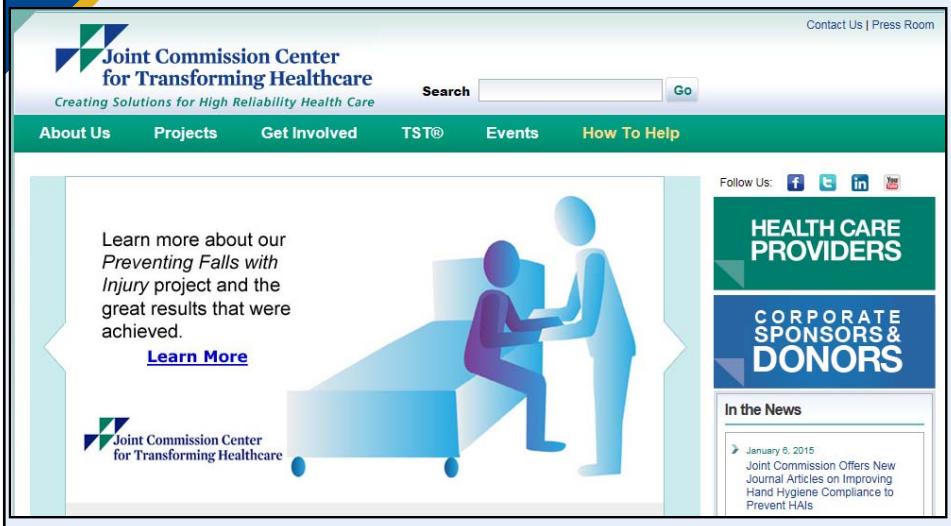
Center for Transforming Healthcare



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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

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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

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Health Facilities Management Magazine

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RPI Improves Housekeeping

- New wing added in 2012: 130,000 SF with new, unfamiliar types of spaces
- Challenge to Environmental Services staff:
  - Add this building to existing 364,000 SF
  - No new staff, same high quality cleaning
- Used RPI to redesign workflow
- Met the challenge
- Saved the hospital about $440,000

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Current State of Quality

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RPI Delivers Results

- "One-size-fits-all" best practice is inadequate
- Complex processes require more sophisticated problem-solving methods (RPI)
- 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**: producing next generation best practices; solutions customized to your causes

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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

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Causes Differ by Hospital

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

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Note that 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.

RPI Drives Major Improvements

Center Projects	Results(%)
Hand hygiene	71↑
Hand-off communication failures	56↓
Wrong site surgery risks	
• Scheduling	46↓
• Pre-op	63↓
• Operating Room	51↓
Colorectal SSIs	32↓
Falls with injury	62↓

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Milbank Q 2013;91:459-90; J Nurs Care Qual 2014;29:99-102

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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: safe surgery and hand-off communication; 2015: falls

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Preventing Falls With Injury

- Falls in hospitals persist
- Rate=4 per 1000 pt days: 30-50% with injury
- 30 different causes, varied by hospital
  - Problems with fall risk assessments
  - All staff must be involved
  - Engage and educate patients and families
- 5 Center hospitals used targeted solutions:
  - Reduced falls with injury by 62%
  - Reduced injury rate from 33% to 19%

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Implications for Typical Hospitals

200 Beds

- Expect 358 falls/yr
  - 117 injuries
  - $1.6M in costs
- Annual impact
  - 72 fewer injuries
  - $1M in costs avoided

400 Beds

- Expect 659 falls/yr
  - 216 injuries
  - $2.4M in costs
- Annual impact
  - 133 fewer injuries
  - $1.9M in costs avoided

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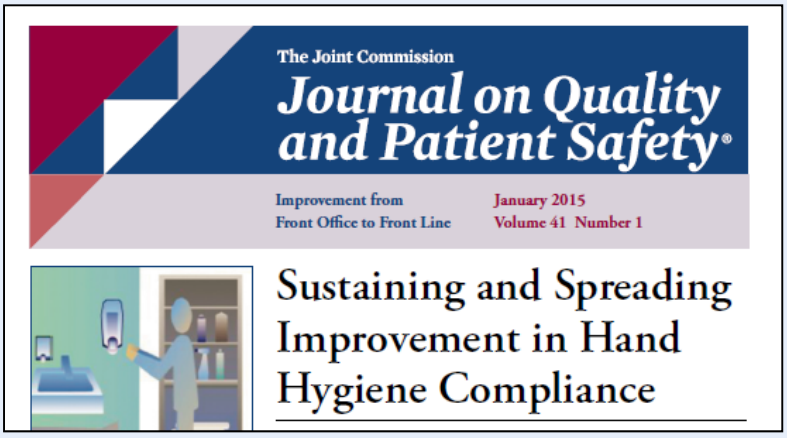
January 2015



Jt Comm Journal on Qual Pat Safety 2015;41(1):4-12 and 13-25

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Impact of Hand Hygiene TST

TST improves HH: 55% to 85%, Reduces HAIs by 35%

300 Beds

- Expect 555 HAIs/yr
- Annual impact:
  - 194 fewer HAIs
  - 12 lives saved
  - $3.7M cost avoided

600 Beds

- Expect 1100 HAIs/yr
- Annual impact:
  - 388 fewer HAIs
  - 24 lives saved
  - $7.5M cost avoided

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CLEVELAND.COM

Cleveland MetroHealth Medical Center increases hand washing, reduces infections

Published: Saturday, September 03, 2011, 5:50 AM Updated: Saturday, September 03, 2011, 7:44 AM

By Sarah Jane Tribble, The Plain Dealer

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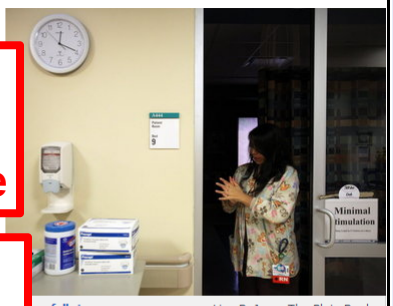
CLEVELAND, Ohio — Who would have thought that Mom could be so right?



ew full size Lisa DeJong, The Plain Dealer

veland MetroHealth Hospital nurse Midalia Gonzalez uses
d sanitizer Friday after seeing a patient in the pediatric ICU.

they are called, began making their rounds in January, bloodstream infections at the hospital have dropped to one-third what they were for all of last year.

Used TST to achieve >95% hand hygiene compliance

Bloodstream infections fell by 2/3

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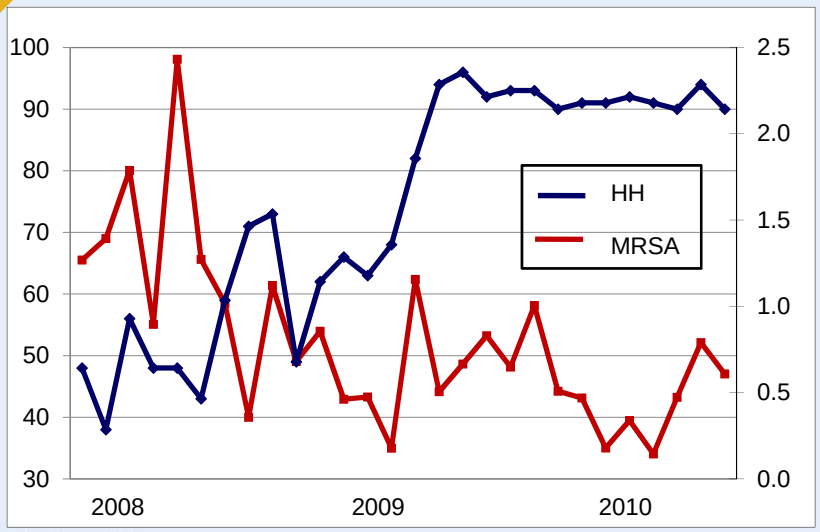
MRSA Rate Decreases as Hand Hygiene Improves



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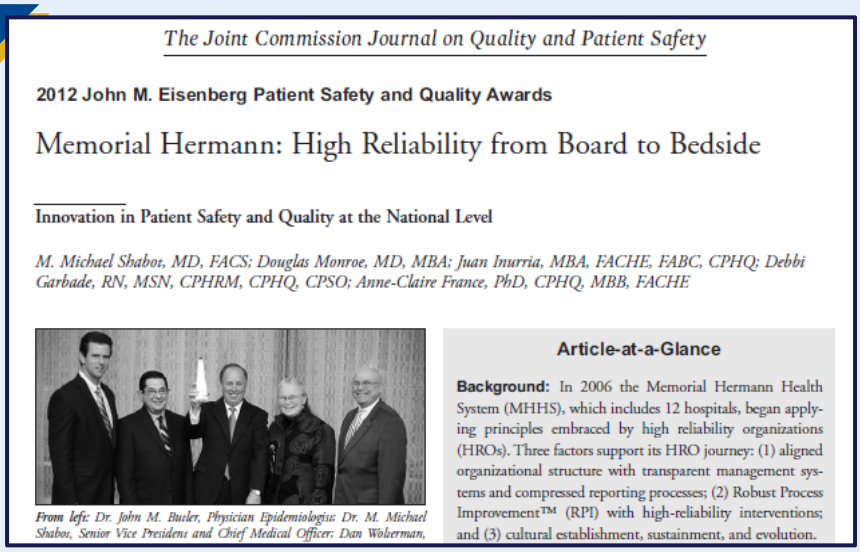
Memorial Hermann: Getting to Zero



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2012 John M. Eisenberg Patient Safety and Quality Awards

Memorial Hermann: High Reliability from Board to Bedside

Innovation in Patient Safety and Quality at the National Level

M. Michael Shabot, MD, FACS; Douglas Monroe, MD, MBA; Juan Inurria, MBA, FACHE, FABC, CPHQ; Debbi Garbade, RN, MSN, CPHRM, CPHQ, CPSO; Anne-Claire France, PhD, CPHQ, MBB, FACHE

From left: Dr. John M. Bueler, Physician Epidemiologist; Dr. M. Michael Shabot, Senior Vice President and Chief Medical Officer; Dan Wolverman,

Article-at-a-Glance

Background: In 2006 the Memorial Hermann Health System (MHHS), which includes 12 hospitals, began applying principles embraced by high reliability organizations (HROs). Three factors support its HRO journey: (1) aligned organizational structure with transparent management systems and compressed reporting processes; (2) Robust Process Improvement™ (RPI) with high-reliability interventions; and (3) cultural establishment, sustainment, and evolution.

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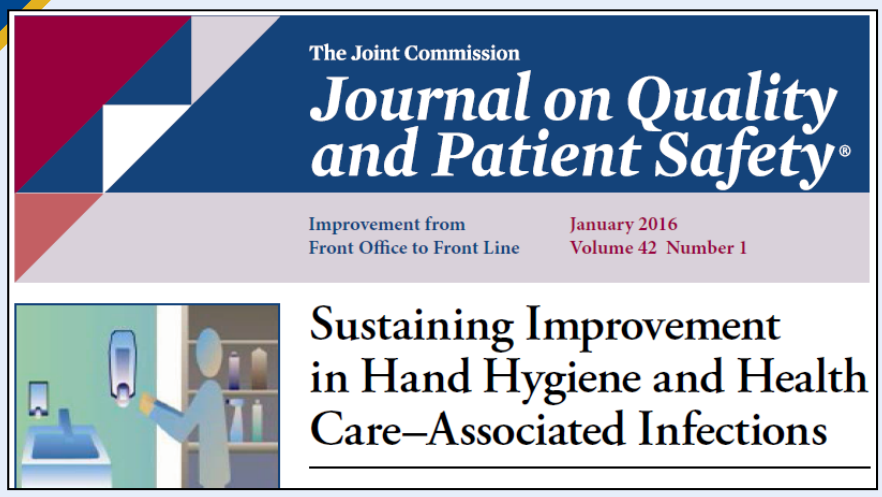
Jt Comm J 2013;39(6):253-57

January 2016



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Journal on Quality and Patient Safety®

Improvement from Front Office to Front Line

January 2016
Volume 42 Number 1

Sustaining Improvement in Hand Hygiene and Health Care–Associated Infections

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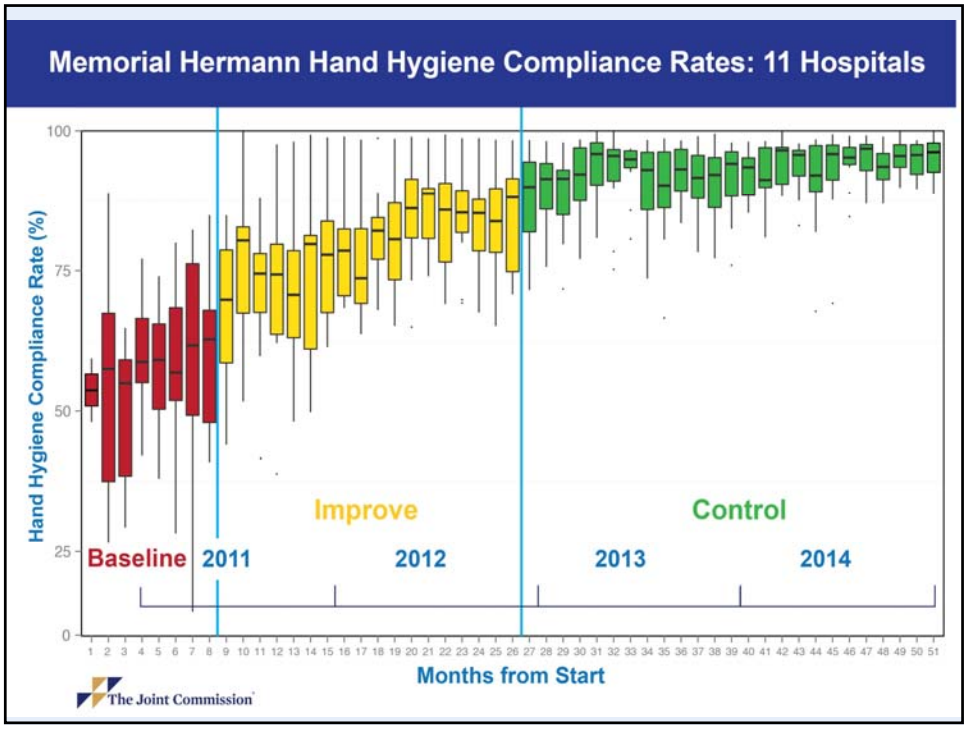
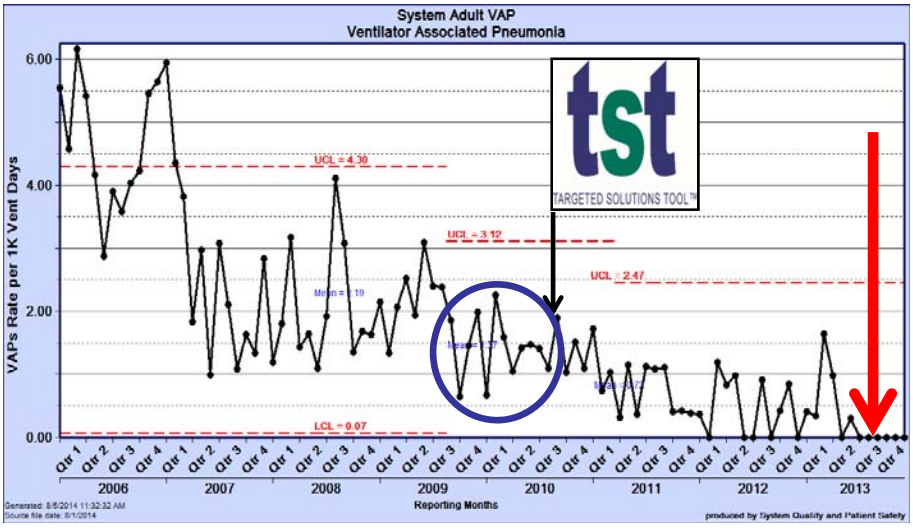
Jt Comm Journal on Qual Pat Safety 2016;42(1):6-17



System - Ventilator Associated Pneumonias: All Adult ICUs

MEMORIAL HERMANN



HAI Hospital Scorecard

MEMORIAL HERMANN

Sugar Land Hospital HAI Scorecard

ICU CLABSI	Floor CLABSI	ICU CAUTI	Floor CAUTI	Total SSI	Perf Std SSI	NHSN SSI
0	0	0	0	0	0	0

Hip	Knee	ORIF	MRSA	Clostridium *difficile*
0	0	0	0	0

Number of HAIs in one month

Michael Shabot, MD
Memorial Hermann System EVP

"We fully attribute to the Center for Transforming Healthcare's hand hygiene TST the final drop in HAI rates to zero or near-zero system-wide. After implementing the hand hygiene TST, our hospitals began to report zeros as their most common monthly CLABSI and VAP result. Our mothers were right after all! Feel free to quote me. This actually saves lives."

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Joint Commission, High Reliability and RPI

- We must have much more ambitious goals for healthcare improvement: zero harm
- Current methods are inadequate
- Lean, six sigma, and change management (RPI) are delivering impressive results
- ROI of at least 4:1 is readily achievable
- Some hospitals/systems approaching zero
- Joint Commission has tools to help

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