Commitment to Zero Harm: Memorial Hermann Health System’s Journey to High Reliability

MHA Patient Safety & Quality Symposium
March 8, 2017

M. Michael Shabot, MD, FACS, FCCM, FACMI
Executive Vice President
System Chief Clinical Officer
Memorial Hermann Health System
Memorial Hermann Health System (02/17)

Hospitals: 15
Rehab Hospitals/Units: 2/5
Conv Care Centrs: 5+3 constr

MH The Woodlands
MH Northeast
MH Cypress
MH Pearland
MH Southeast
MH Sugar Land
MH Katy
MH Memorial City
MH Northwest
MH TMC
MH Children’s
MHH
MH Southwest
MH Katy Rehab

15 Hospitals
2/5 Rehab Hospitals/Units
5+3 Construction

22 Amb Surgery Centers
37 Imaging Centers
44 Sports Med & Rehab
37 Diagnostic Labs
497 Adv Prim Care Practice
2,620 Clinical Integ Specialists

TIRR MH IS 610 Grand Pkwy Beltway 8 MH OSH 3

Sienna Plantation
League City
Dickinson
Question: How many avoidable deaths occur in U.S. hospitals each year?

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

Medical error—the third leading cause of death in the US

Medical error is not included on death certificates or in rankings of cause of death. Martin Makary and Michael Daniel assess its contribution to mortality and call for better reporting.

Martin A Makary professor, Michael Daniel research fellow

Department of Surgery, Johns Hopkins University School of Medicine, Baltimore, MD 21287, USA

Hospital Patient Harm

Memorial Hermann’s Goal

0 (Zero)

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

How Can Memorial Hermann Get to Zero?

New Doctors?

New Nursing Staff?

All New Execs?
How Can Memorial Hermann Get to Zero?

All New Execs?
Robust Process Improvement: Path to Quality Outcomes
OUR HOSPITALS ARE KILLING US

An alarming report on conditions in many American cities

SCHOOL TESTS
Do they help learning or invite cheating?

JACQUELINE KENNEDY TODAY

DIRT, INFECTION, ERROR AND NEGLIGENCE:
The hidden death threat in our hospitals

BY MARTIN L. GROSS

The unprelentigated "Death Reports" two generating studies conducted by the Columbia University School of Public Health and Administration and the University of the South's K. W. Terrell and N. A. Morehead, are finding relative safety and negligence in hospitals. Thus far, the studies of 17 hospitals in 11 states have shown that death rates are higher in small hospitals than in large ones. The studies also show that death rates are higher in hospitals that use more medical and surgical procedures.

The hidden death threat in our hospitals is not just a statistical problem. It is a real problem that affects the health and well-being of patients. The studies show that the death rate in hospitals that use more medical and surgical procedures is higher than in hospitals that use fewer procedures. This is because the procedures used in hospitals are often more invasive and risky than those used in smaller hospitals.

The hidden death threat in our hospitals is also a problem because of the lack of appropriate medical care. The studies show that death rates are higher in hospitals that have less medical staff and less medical equipment. This is because the hospitals that have less medical staff and less medical equipment are often unable to provide the care that patients need.

The hidden death threat in our hospitals is a problem that affects all patients. It is a problem that affects patients of all ages and all backgrounds. It is a problem that affects patients who are rich and patients who are poor. It is a problem that affects patients who are healthy and patients who are sick. It is a problem that affects patients who are white and patients who are black.

The hidden death threat in our hospitals is a problem that affects all patients. It is a problem that we must address. We must work to improve the quality of medical care in hospitals. We must work to make sure that hospitals have the staff and the equipment that they need to provide the care that patients need. We must work to make sure that hospitals are safe for all patients.

The hidden death threat in our hospitals is a problem that we must address. We must work to improve the quality of medical care in hospitals. We must work to make sure that hospitals have the staff and the equipment that they need to provide the care that patients need. We must work to make sure that hospitals are safe for all patients.
"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
United Airlines

Customer Service: Worst US Airline x5+ yr

Bankruptcies: Too Many to Count (TMTC)

Employee Unions: In Disarray x5+ Years

CEOs: TMTC, Smisek Possible Indictment

Last Fatal Crash? 1992
Memorial Hermann’s Journey to High Reliability
Transformation to a High Reliability Organization

August 14, 2006

A Call to Action on Patient Safety

Transfusion Errors

Serious Safety Events
Burning Platform
Board Commitment
Safety as the Core Value

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
Role of the Board

- Leadership for high reliability, safety & quality initiatives
- Ensuring the Board receives quality & safety results information it needs
- Providing guidance for the System Quality Committee
- Providing support for safety & quality initiatives, including financial support
IHI “From the Top”
The Role of the Board in Quality & Safety

FACULTY

James E. (Jamie) Orlikoff, President, Orlikoff & Associates, Inc.

James L. Reinertsen, MD, President, The Reinertsen Group, is also Senior Fellow at IHI.
2015 MH “From the Top”
The Role of the Board and Medical Staff in Quality & Safety

February 20, 2015 - 7:30am-5:00pm
Houston, Texas

55 Memorial Hermann Board members and 100 MEC members & hospital execs trained
Total Transparency with the Board

Serious Safety Event Summary – (Month Year)

- **Erin W.** 52 yrs
  - Delay in treatment of hematomas after hysterectomy

- **Nickole C.** 87 yrs
  - DVT with no risk assessment

- **Mary S.** 95 yrs
  - Missed fracture resulting in renal failure

- **Eunice S.** 99 yrs
  - Fall with cerebral bleed

- **Justin G.** 49 yrs
  - Missed dose of TPA, failure to treat stroke

- **Ellie R.** 26 yrs
  - Failure to treat post-partum hemorrhage

- **Mike S.** 1 wk
  - Rectal biopsy resulting in small bowel perforation

- **Sue B.** 80 yrs
  - Fall with cerebral bleed

- **Paul J.** 89 yrs
  - Delay in diagnosis and treatment of chest pain

- **Harry D.** 76 yrs
  - DVT with no risk assessment

- **John R.** 64 yrs
  - Failure to implement ordered respiratory treatment

- **Sue B.** 80 yrs
  - Fall with cerebral bleed

- **Alice C.** 44 yrs
  - DVT with no prophylaxis

- **Tom L.** 22 yrs
  - Contraindicated anticoagulant given resulting in bleeding and death

- **Sam M.** 78 yrs
  - Medication error resulting in arrest

- **Rick L.** 71 yrs
  - Wrong procedure performed

- **Ben S.** 87 yrs
  - Overdose of heparin with cerebral bleed

- **Cade O.** 12 yrs
  - Urethral trauma secondary to Foley placement
MHHS Safety Culture Training
Completed in 2007

Hospital Training Complete

>20,000 Employees Trained

>4,000 Physicians Trained

>540 Safety Coaches Trained

>$18M Expense
Breakthroughs in Patient Safety Training
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
Self-Checking With STAR* (Stop, Think, Act, & Review)

“It sort of makes you stop & think, doesn’t it?”

* Jefferson Center for Character Education
Safety Success Stories

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 - Verify with two patient identifiers before acting
2. ‘Time Out’ before invasive and high-risk procedures
3. ‘Two-Provider Check’ before administration of blood, blood products and high-risk medication
Robust Process Improvement: 
*Path to Quality Outcomes*
Robust Process Improvement: Path to Quality Outcomes

Lean

Six Sigma

Change Management
Effectiveness of solutions

Effectiveness = Q x A₁ x A₂

Quality of solution (Q) x

Acceptance (A₁) x

Accountability (A₂)
Robust Process Improvement: 
Changing Standard Work

Step 8
Implement Standard Work

Standard Work =
What we do every day

What we do every day =
CULTURE!
Robust Process Improvement: High Reliability Standard Work

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Central Line Sterile Insertion Bundle

Surgical Safety Checklist

High Reliability Hand Hygiene

Culture Change

OR Surgical Safety Checklist
High Reliability Transformation

5th Annual Robust Process Improvement Expo Feb 17, 2017

Over 150 Attendees - 63 RPI Projects
2nd Annual High Reliability Sharing Days Feb 15-17, 2017

- Mem City Hospital Tours
- End to End Care Vision
- High Reliability Journey Milestones
- CEO/CMO Collaboration
- Individuals and Teams
- CMO Perspective
- Physician Engagement in RPI
- Structure of Safety
- Robust Process Improvement: Role in High Reliability
- Ambulatory Quality: Early Work
- Panel Discussion: Quality and Performance Improvement Governance Structure
2nd Annual High Reliability Sharing Days Attendees (41)

- Ben Taub/BCM
- Dignity Health
- Flagler Hospital
- Harris Health
- Henry Ford
- Hoag Hospital
- IHI
- Intermountain
- MedStar
- Michigan Hospital Association
- Mount Sinai
- Navigant
- Orlando Health
- Sentara
- St. Joseph Mercy
- Swedish Health System
- Tampa General
- University Health Network, Toronto
- UT Southwestern
- VCU Medical Center
MEC Approvals for Quality & Safety Guidelines Across a Health Care System

**Issue:**
Achieving uniform physician governance in multiple hospitals
MHMD Clinical Programs Committee & Subcommittees

2015 SUMMARY OF ACTIONS

519 Evidence-Based Practice Recommendations made by CPCs in 2016
Selected MEC-Approved CPC & SQC Safety & Quality Guidelines

• Real-Time Ultrasound for Central Line Insertion
• Real-Time Ultrasound for Cath Lab Central Punctures
• OB Safety Training

• Prevention of Retained Foreign Bodies Policy
• DVT/PE Prophylaxis
• Bariatrics Privileging and Leveling
• Moderate and Deep Sedation Privileging
• Peer Review for Physician-Related SSEs
• Clinical Escalation Policy
• Postoperative Pulse Oximetry Monitoring
Obtaining MEC Approvals Across the System

“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

TO: Chiefs of Staff
   Chiefs of Staff-Elect
   Chief Executive Officers
   Chief Medical Officers
   Chief Nursing Officers

FROM: Charlotte Alexander, MD
       Chair, System Quality Committee

DATE: January 17, 2013

SUBJECT: SQC Approved Safety Standard for 24 Hours Continuous Pulse Oximetry Monitoring in Postoperative PCA Patients

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 felt to be at increased risk due to the residual effects of anesthesia and narcotic medications received in the OR and PACU, when combined with postoperative PCA narcotics. In response to these events and after complete discussion with multiple CPC subcommittees, the Full CPC and the MHMD Board approved a new safety 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 15.

To facilitate electronic ordering, the CPC Editorial Board has changed the standard postoperative PCA PowerPlan to make 24 hours continuous pulse oximetry monitoring a default choice.

Hospital MECs and MEC committees should review this new safety standard carefully. It is our recommendation this standard be addressed by a formal vote of each 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.
Hospital Acquired Conditions “Never Events”

Acute Hemolytic Transfusion Reactions

Transfusion Events Jan 2007 - Dec 2016

2,617,000 Adjusted Admissions

14,234,000 Adjusted Pt Days

1,240,000 Transfusions
Acute Hemolytic Transfusion Reactions

Transfusion Events Jan 2007 - Dec 2016

PSI 16 Transfusion Reaction - Per 1000

2,617,000 Adjusted Admissions
14,234,000 Adjusted Pt Days
1,240,000 Transfusions

Zero
Joint Commission Hand Hygiene
Center for Transforming Healthcare

Baseline Compliance 44% >90% compliance since Nov 2012

“Secret Shopper” measurements per month

Compliance Rate

Secret Observations Compliance Rate
Adult ICU Central Line Associated Blood Stream Infections (CLABSI)

CLABSI Rate per 1K Line Days
Central Line Associated Blood Stream Infections

Mean = 5.53
LCL = 1.64
UCL = 9.42
Mean = 3.04
LCL = 0.29
UCL = 5.79
Mean = 2.52
LCL = 0.38
UCL = 5.13
Mean = 2.12
LCL = 0.29
UCL = 4.35
Mean = 1.46
LCL = 0.29
UCL = 2.97
Mean = 1.17
LCL = 0.29
UCL = 2.55

TJC Center for Transforming Healthcare
Hand Hygiene
Ventilator Associated Pneumonias: All Adult ICUs

System Adult VAP
Ventilator Associated Pneumonia

TJC Center for Transforming Healthcare
Hand Hygiene

VAPs Rate per 1K Vent Days

2006 2007 2008 2009 2010 2011 2012 2013

Reportin Months

UCL = 4.30
Mean = 0.19
LCL = 0.07
UCL = 3.12
Mean = 0.17
UCL = 2.47
Mean = 0.14

produced by System Quality and Patient Safety
Catheter Associated Urinary Tract Infections (CAUTIs)
Catheter-Associated UTIs
Floor & ICU House-Wide

Greater Heights Adult CAUTI Floor
Do No Harm
Catheter-Associated Urinary Tract Infections

CAUTI Count

Reporting Months

Generated: 2/15/2016 2:42:03 PM
Source file date: 2/15/2016

produced by System Quality and Patient Safety
MHHS CAUTI (Floor Only) SIRs by Facility
January 2015 - December 2015

- NHSN MH System: 0.14
- TIRR: 0.45
- KT Rehab: 0.00
- Woodlands: 0.00
- Southwest: 0.11
- Southeast: 0.09
- Greater Heights: 0.00
- Sugar Land: 0.00
- Northeast: 0.29
- Mem City: 0.31
- Katy: 0.20
- CMHH: 0.00
- TMC: 0.37

Legend:
- Distinguished (SIR ≤ 0.3)
- Target (SIR = 0.31 - 0.79)
- Threshold (SIR = 0.8 - 1.00)
- NHSN National Benchmark
- NHSN 50th Percentile (0.57)
- NHSN 25th Percentile (0.1875)
### Sugar Land Hospital HAI Scorecard

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**Number of HAIs in one month**
### Sugar Land Hospital HAI Scorecard

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**Number of HAIs in one month**
Central Line Associated Bloodstream Infections
Ventilator Associated Pneumonias
Surgical Site Infections
Retained Foreign Bodies
Intraoperative and Postoperative Infections
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
High Reliability
Certified Zero Award

1. Zero Events
2. 12 Consecutive Months
3. Certified Zero Category
High Reliability Certified Zero Award

To: Memorial Hermann Southeast Hospital
Zero iatrogenic Pneumothorax for 12 Months

February 1, 2010 to January 31, 2011

Dan Wolterman
President & Chief Executive Officer

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

Robert G. Croyle
Chair, Health System Board
MH Greater Heights: Zero Retained Foreign Bodies

Northwest Adult FB
Foreign Body Left During Procedure
Rate/1000 Discharges for Secondary Diagnosis

MD/Nursing OR Count Policy  Mandatory RFID Scanning

Zero Retained Foreign Bodies x 72 Months
MH Children’s: Zero Ventilator Associated Pneumonias

CMHH PICU VAP
Do No Harm
Ventilator Associated Pneumonia

Ventilator Bundle Compliance

Zero Ventilator Associated Pneumonias x 48 Months
MH Katy: Zero Central Line Blood Stream Infections Hospital-Wide x 17 Months

Katy Adult Hospital CLABSI
Do No Harm
Central Line Associated Blood Stream Infections

Central Line Bundle Compliance

Zero CLABSI Hospital-Wide x 17 Months
MH Sugar Land: Zero ICU Catheter Associated UTIs

Sugar Land Adult ICU CAUTI
Do No Harm
Catheter-Associated Urinary Tract Infections

CAUTI Bundle Compliance

Zero ICU CAUTIs x 24 Months
MH Woodlands: Zero Hospital Acquired Injuries

Memorial Hermann The Woodlands Hospital
Hospital Acquired Injuries - Per 1000 Inpatients

Zero Hospital Injuries x 21 Months
High Reliability 2011-16
Certified Zero Awards

ICU Central Line Associated Bloodstream Infections (18)
ICU Catheter Associated Urinary Tract Infections (13)
Hospital-Wide Central Line Associated Bloodstream Infections (7)
Hospital-Wide Catheter Associated Urinary Tract Infections (4)
Ventilator Associated Pneumonias (23)
  Surgical Site Infections (0)
  Retained Foreign Bodies (44)
  Iatrogenic Pneumothorax (23)
Accidental Punctures and Lacerations (3)
Pressure Ulcers Stages III & IV (34)
Hospital Associated Injuries (6)
Deep Vein Thrombosis and/or Pulmonary Embolism (2)
Deaths Among Surgical Inpatients with Serious Treatable Complications (1)
  Birth Traumas (16)
Obstetric Trauma in Natural Deliveries with Instrumentation (4)
  Serious Safety Events 1&2 (17)
  Serious Safety Events 1 & 2 for 1000 Days (2)
  All Serious Safety Events (1)
  Early Elective Deliveries (7)
Manifestations of Poor Glycemic Control (18)
In 2013 the South Carolina Hospital Association established the Certified Zero Harm Award

www.SCZeroHarm.com
Zero Harm Awards were first presented in 2014

Results to date:

- **Two-thirds** of South Carolina’s acute care hospitals have received at least one Zero Harm Award
- All together, South Carolina hospitals have earned 258 **Zero Harm Awards**
- This year’s award winners amassed **55,291** central line days without an infection
- They also performed **9,700** harm-free surgical procedures
- And twelve of this year’s winners were recognized for **42 consecutive months** without harm
Serious Safety Events
Memorial Hermann
Ethics Recognition
06/01/15
To: Memorial Hermann Killeen
for 24 months
2013 to May 2015
18

President & Chief Executive Officer
Will Williams
Chair, Health System Board
September 6, 2015
MH Greater Heights Hospital
1000 Days Since Last SSE1-2
John M. Eisenberg Patient Safety and Quality Award

March 8, 2013 | Washington, DC
Memorial Hermann
Sugar Land Hospital

Malcolm Baldrige
National Quality Award
2016 Award Recipient
EXTENDING THE COST CURVE

Report says hospitals’ share of spending will shrink while rising for doctors

"This law hasn’t had a very significant effect in bending the cost curve in any direction."
— Richard Fronter, chief CMS actuary

Preparing for the debt fallout / Page 8
Embezzlers test compliance / Page 12
Hidden cost of capital access / Page 32

From the C-Suite >> Dan Wolterman and Dr. M. Michael Shabot

A new standard

Aim for safety of planes, nuclear plants

Everyone counts on high-reliability organizations to ensure their safety when flying on commercial airlines or traveling near nuclear power plants. Air traffic control, nuclear submarines, nuclear aircraft carriers and naval aviation all have well-deserved reputations for high-reliability operation.

But can hospitals be evaluated by HRO standards? In general, the answer seems to be no, beginning with the Institute of Medicine’s 2000 publication of To Err is Human and continuing to the 2010 report by HHS’ inspector general’s office that 13.5% of Medicare beneficiaries suffer a preventable serious adverse event during hospital stays.

In 2006, the Memorial Hermann Healthcare System in Houston embarked on a quest to become an HRO. The high-reliability program is a key element of lists were implemented in all intensive-care units and operating rooms. Memorial Hermann worked with the Joint Commission’s Center for Transforming Healthcare to radically improve hand hygiene.

In 2010-11, the results of these initiatives became apparent. Zero cases of blood incompatibility (transfusion reaction) occurred from January 2007 to present among a population of 867,000 adjusted admissions, 4.3 million days of care and nearly 500,000 transfusions.

Several hospitals had gone for years without a ventilator-associated pneumonia or a central-line-associated blood-stream infection. Serious medication errors decreased to zero most months while nearly a million medications per month were being administered. Many of our hospitals had gone a full year without the occurrence of a particular HAI, PSI or HAC.
High Reliability Organizations

Commercial Aviation

Nuclear Aircraft Carriers

Air Traffic Control
High Reliability Organizations

- Memorial Hermann Health System
- Nuclear Aircraft Carriers
- Air Traffic Control
- Commercial Aviation
Thank you!

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

Mahatma Gandhi (1869-1948)