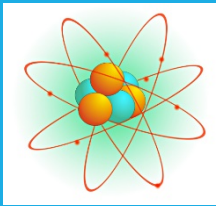


# A **GLOWING** RESEMBLANCE

**A COMPARE AND CONTRAST OF MEDICAL AND NUCLEAR  
PERFORMANCE IMPROVEMENT INITIATIVES**



**23<sup>rd</sup> Annual HPRCT Conference**

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**June 12-15, 2017**

**Thomas Diller, MD, MMM; Executive Director  
University of North Texas Health Science Center Institute for Patient  
Safety (UNTHSCIPS)**

**Rey Gonzalez, President of HOPE Consulting LLC; Associate Fellow,  
UNTHSCIPS**



UNT HSC | INSTITUTE FOR  
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**Our Mission:** To innovatively impact the lives of every patient, student, and healthcare professional by creating a ubiquitous culture of patient safety throughout our community.

**Our Goals:** To improve patient safety and reduce preventable patient harm through... Education, Research, Consulting and Influence.

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Enhancement  
HOPE Consulting LLC

The logo for HOPE Consulting LLC features a stylized blue flame or wave shape to the right of the text.



# US Nuclear Industry

# International Nuclear Industry



Chernobyl

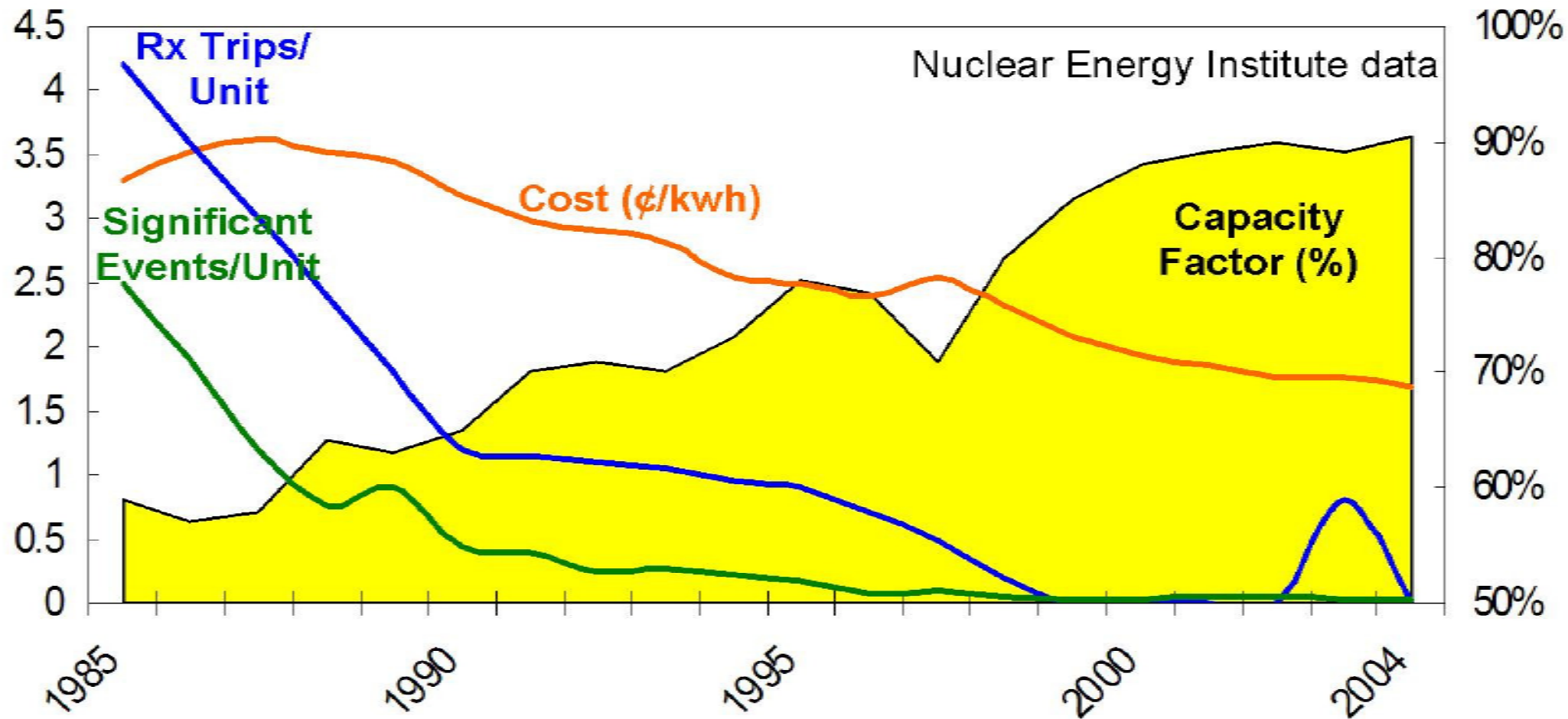


Fukushima

# Nuclear Industry – What Was Done to Become an HRO

- Focus on running the plant as designed\*
- Emphasis on defense-in-depth mindset
- A cultural focus shift on our #1 priority; Nuclear Safety = Public Safety (Enhancing Nuclear Safety Culture)
- Enhanced Training and Qualification (including maintenance of the same)
- A focus on equipment reliability\*
- A focus on human performance
- Planning for the unexpected

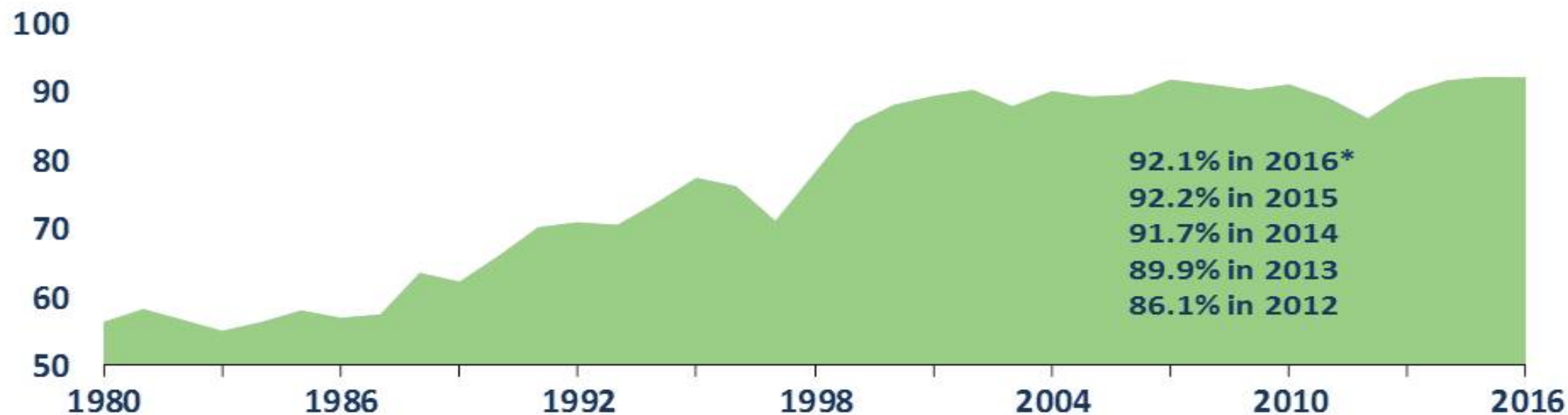
# The domestic nuclear generation industry has seen benefits from implementation of HPI.





# Sustained Reliability and Productivity

*U.S. Nuclear Capacity Factor, Percent*



**NEI**

NUCLEAR ENERGY INSTITUTE

Source: Energy Information Administration

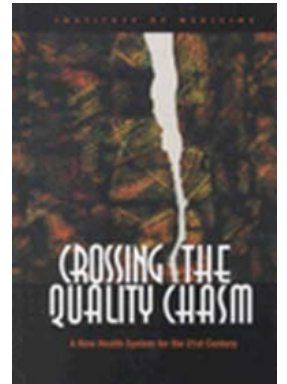
Updated: 3/17

\* - EIA states the capacity factor for nuclear is 92.5% but does not include the capacity for Fort Calhoun. NEI included Fort Calhoun's capacity for the nuclear capacity factor value.

Human &  
Organizational  
Performance  
Enhancement  
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# Institute of Medicine Reports

- “To Err is Human”: November 1999
  - Estimated 44,000–98,000 annual deaths due to medical error
  - Estimated a cost of \$17 to \$29 billion
  - Errors are caused primarily by faulty systems, processes, and conditions that lead people to make mistakes or fail to prevent them.
- “Crossing the Quality Chasm”: March 2001
  - Laid out a roadmap to improve the nation’s healthcare system
  - Six Aims for Improvement
  - Recommended 4 strategies
    - Healthcare must be evidence-based
    - Substantially increase the use of information technology
    - Align payment policies with quality improvement
    - Must prepare healthcare providers and workforce for change





# 17 Years After “To Err is Human”

**Graph 1:** Percent of hospitals with overall accountability composite greater than 95 percent

Graph 1: Percent of hospitals with overall accountability composite greater than 95 percent



Since implementation in 2002, the average number of hospitals reporting data was 3,262 and ranged from 3,073 to 3,419.

The Joint Commission: America's Hospitals: Improving Quality and Safety – 2016 Annual Report

## • Outcome Measures

Condition	2005 - 2007	2009 - 2011
Coronary Artery Bypass Surgery (CABG)	2.9%	2.2%
Pneumonia	5.2%	4.2%
Heart Attack	10.3%	7.5%
Sepsis	22.0%	17.3%

Risk-Adjusted Hospital Mortality - HealthGrades: American Hospital Quality Outcomes 2013

## • Infection Rates

- 50 percent decrease in central line-associated bloodstream infections (CLABSI) between 2008 and 2014
- 8 percent decrease in hospital-onset *Clostridium difficile* (*C. difficile*) infections between 2011 and 2014
- 13 percent decrease in hospital-onset methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia (bloodstream infections) between 2011 and 2014

CDC's annual *National and State Healthcare-Associated Infections Progress Report* (HAI Progress Report) (2014 data, published 2016)

# Medical Error: The Third Leading Cause of Death in the US

Makary and Daniel; British Medical Journal 2016

**Table 1 | Studies on US death rates from medical error since the 1999 IOM report and point estimate from pooled results**

Study	Dates covered	Source of information	Patient admissions	Adverse event rate (%)	Lethal adverse event rate (%)	% of events deemed preventable	No of deaths due to preventable adverse event	% of admissions with a preventable lethal adverse event	Extrapolation to 2013 US admission†
Health Grades <sup>11</sup>	2000-02	Medicare patients	37 000 000	3.1	0.7*	NR	389 576	0.71	251 454
Office of Inspector General <sup>12</sup>	2008	Medicare patients	838	13.5	1.4	44	12	0.62	219 579
Classen et al <sup>13</sup>	2004	3 tertiary care hospitals	795	33.2	1.1	100	9	1.13	400 201
Landrigan et al <sup>14</sup>	2002-07	10 hospitals in North Carolina	2341	18.1	0.6	63	14	0.38	134 581
Point estimate from all data	2000-08	—	—	—	—	—	—	0.71	251 454‡

NR=Not reported.

\*All were considered preventable.

†Total number of US hospital admissions in 2013 was 35 416 020.<sup>10</sup>

‡Total number of people who died from a preventable lethal adverse event calculated as a point estimate of the death rate among hospitalized patients reported in the literature extrapolated to the reported number of patients hospitalized in 2013.

# Medical Error: The Third Leading Cause of Death in the US

Makary and Daniel; British Medical Journal 2016

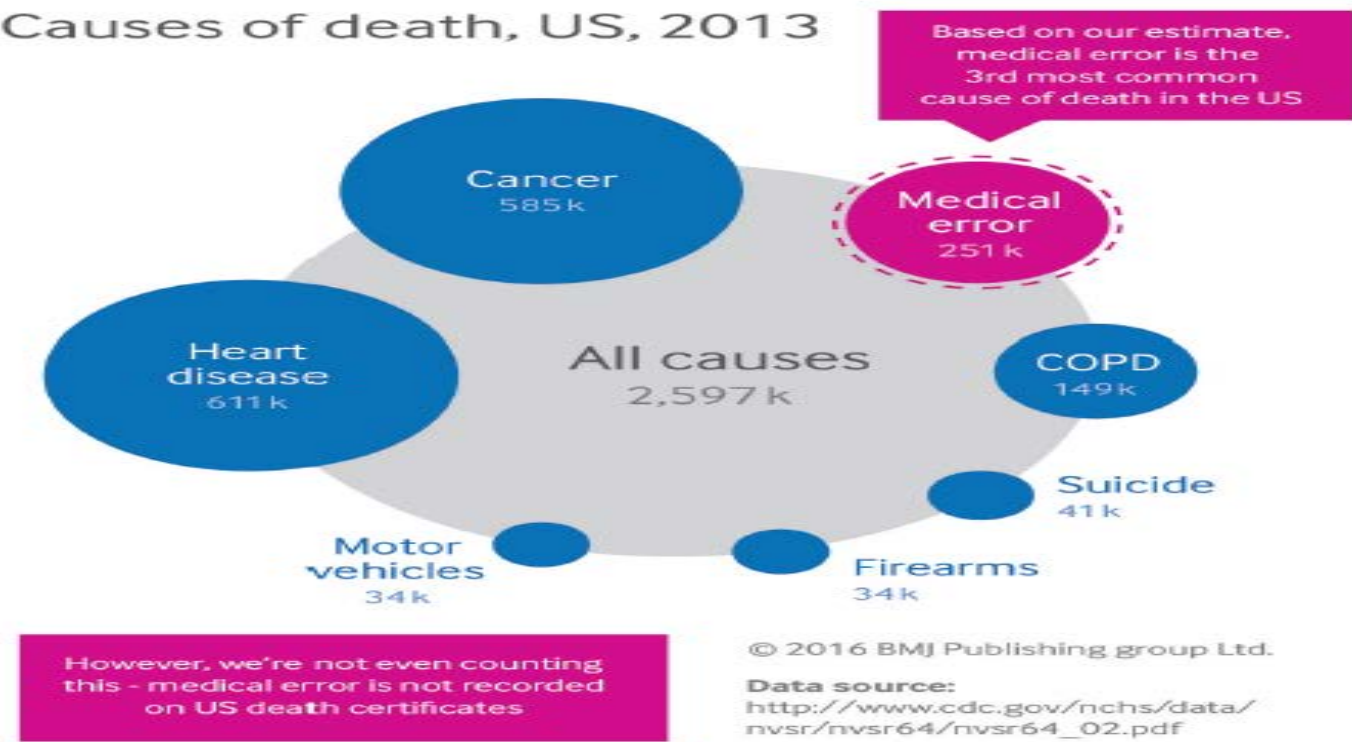


Fig 1 Most common causes of death in the United States, 2013<sup>2</sup>

Location	Deaths /Year	Deaths / Day	Harm / Day
United States	~251,000	~688	~12,400 - ~20,630
Texas	~21,600	~59	~1,065 - ~1,775

# Current Quality Approach

- Good Quality is Assumed to Equal Safe Patient Care
- Quality and Safety are Often NOT the Top Priority of Leadership
- Quality Improvement is Project Based
- PI Methods are Inadequate
- Reactive, rather than Proactive
- We must transform our culture of safety to a high reliability orientation!!!

# RESEMBLANCE #1 ROOT CAUSE ANALYSIS

## Challenges:

Reactive response to undesirable events

Management culture looking for individual blame

Ineffective cause evaluations

---

## Good News:

We are taking some proactive responses

Management learned about the impact of system weaknesses and an understanding of a Just Culture

Much better at cause evaluations

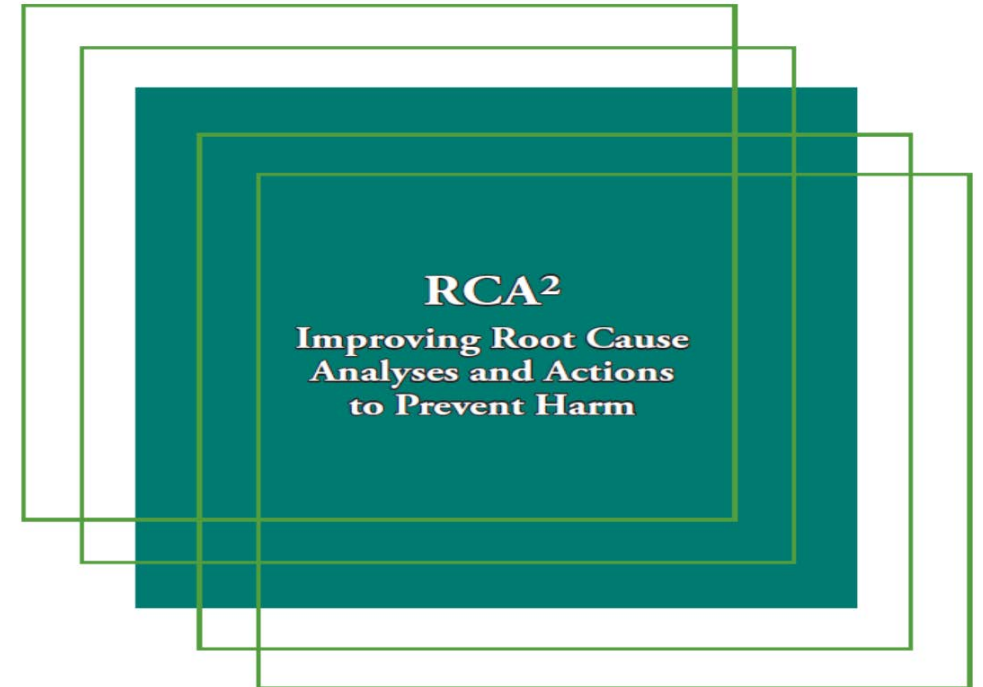
# Traditional Healthcare Root Cause Analysis

- **Heavily focused on TJC “Sentinel Events”**
  - Focused primarily on actual harm, rather than the risk of harm.
- **Facilitates a Culture of Blame**
  - Find out “Who” did “What”, rather than “Why” an event occurred.
- **Flawed Investigation Process**
  - Inconsistent investigation processes and thus findings.
  - Cases are handled one at a time rather than taking a systematic view of error risk.
- **The Root Causes are Usually High Level and Not Actionable**
  - We can’t improve “poor communication”.
- **Corrective Actions Do Not Solve the Problems, which then Recur**
  - Find who is at fault and punish them.
  - Change a policy or process with variable outcomes.
  - More education and training.
  - “Try Harder!!!”



# RCA<sup>2</sup> – Root Cause Analysis and Action

- Root Cause Analysis – An investigation of an adverse event or near miss with the intent of identifying its causes. The goal is to reduce or eliminate the likelihood of a future similar event.
- Health Care RCA's have not been as effective at preventing future harm as needed.
  - Lack of standardized approach to the RCA.
  - Failure to identify true root causes and prioritize them.
  - Failure to identify systems-based corrective actions.
  - Failure to timely execute the RCA and corrective actions.
  - Failure to ensure follow-through on corrective actions implementation.
  - Failure to measure and reassess the effects of the corrective actions.
  - Failure to engage leadership at all levels of the organization in preventing harm.



Version 2. January 2016

 **NPSF** National Patient Safety Foundation  
268 Summer Street | Boston, MA 02210 | 617.391.9900 | [www.npsf.org](http://www.npsf.org)

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Organizational  
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# The Human Factors Analysis Classification System (HFACS) Applied to Health Care

American Journal of Medical Quality  
XX(X) 1–10  
© 2013 by the American College of  
Medical Quality  
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sagepub.com/journalsPermissions.nav  
DOI: 10.1177/1062860613491623  
ajmq.sagepub.com



**Thomas Diller, MD, MMM,<sup>1,2,3</sup> George Helmrich, MD,<sup>1</sup> Sharon Dunning, BSN, MBA,<sup>1</sup> Stephanie Cox, RN, MPA,<sup>1</sup> April Buchanan, MD,<sup>1,3</sup> and Scott Shappell, PhD<sup>2,4</sup>**

## Abstract

In spite of efforts to improve patient safety since the 1999 report, *To Error Is Human*, recent studies have shown limited progress toward preventing serious error. Most hospitals use root cause analysis as a method of serious event investigation. The authors postulate that this method suffers from 4 problems: (a) the use of root cause analysis is neither standardized nor reliable between organizations, (b) hospitals focus on “who” did “what” rather than on “why” the error occurred, (c) the identified causes are often too nonspecific to develop actionable correction plans, and (d) a standardized nomenclature does not exist to allow analysis of recurring errors across the organization. This article describes the modification of the Human Factors Analysis Classification System based on James Reason’s theory of error causation for use in health care. This method resolves the 4 deficiencies noted above. The authors’ experience investigating 105 serious events over 2 years is described.

# HFACS Findings

## Organizational Influences (96)

- Inadequate Staffing (21)
- Inadequate Policies (13)
- Inadequate Strategic Risk Assessment (13)
- Inadequate Corporate Procedures (9)

## Supervision (69)

- Failure to Enforce Policies / Procedures (15)
- Inadequate Mentoring, Coaching (7)
- Inadequate Oversight (7)
- Inadequate Training (6)

## Preconditions for Unsafe Acts (694)

- Inadequate Comm. Between Providers (82)
- Failure to Warn/ Disclose Critical Information (58)
- Inadequate Comm. During Handoff (46)
- Failure to Use All Available Resources (41)
- Inadequate Comm. Between Workgroups (41)
- Lack of Teamwork (32)
- No or Ineffective Communication Methods (30)
- Task Overload (26)
- Confusing / Conflicting Directions (21)
- Inadequate Comm. - Staff to Patient (21)
- Perceived Haste (18)
- No One in Charge (18)

## Unsafe Acts (852)

- Routine Violation of Policy / Procedure (76)
- Inadequate Risk Assessment (75)
- Critical Thinking Failure (66)
- Caution / Warning Ignored or Misinterpreted (65)
- Wrong Response to Urgent Situation (50)
- Failure to Assess Patient (47)
- Inadequate Report Provided (44)
- Misinterpretation of Information (39)
- Failure to Monitor Patient (34)
- Inadequate / Untimely Communication (33)
- Distracting Behavior (26)
- Selected Incorrect Procedure (23)

# RESEMBLANCE #2 CHECKLISTS

## Challenges:

Some of the original culture didn't value and therefore didn't start with many checklists, job aids, or procedures

Didn't start with any reinforced expectations for use

---

## Good News:

Checklists, job aids, procedures and standard work documents exist in plenty

Reinforced expectations for use by top performers

# I Have a New Surgical Instrument!!!

I will give it to you FREE.

Surgical staff find it easy to use and learn.

It will take about 3 minutes per case.

It's proven to:

- Cut operative mortality by 50%

- Cut surgical site infections by 50%

- Cut any surgical complication by 33%


- Cut all unplanned returns to the OR by 25%

Will you use it???





# Surgical Safety Checklist


World Health Organization

SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia
Before skin incision
Before patient leaves operating room

SIGN IN

☐ PATIENT HAS CONFIRMED

- IDENTITY
- SITE
- PROCEDURE
- CONSENT

☐ SITE MARKED/NOT APPLICABLE

☐ ANAESTHESIA SAFETY CHECK COMPLETED

☐ PULSE OXIMETER ON PATIENT AND FUNCTIONING

DOES PATIENT HAVE A:

KNOWN ALLERGY?

☐ NO
☐ YES

DIFFICULT AIRWAY/ASPIRATION RISK?

☐ NO
☐ YES, AND EQUIPMENT/ASSISTANCE AVAILABLE

RISK OF >500ML BLOOD LOSS (7ML/KG IN CHILDREN)?

☐ NO
☐ YES, AND ADEQUATE INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

☐ CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE

☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM

- PATIENT
- SITE
- PROCEDURE

ANTICIPATED CRITICAL EVENTS

☐ SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?

☐ ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?

☐ NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?

☐ YES
☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?

☐ YES
☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

☐ THE NAME OF THE PROCEDURE RECORDED

☐ THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)

☐ HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)

☐ WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED

☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

	Baseline	Checklist	P Value
Cases	3,733	3,955	
Death	1.5%	0.8%	0.003
Any Complication	11.0	7.0	<0.001
Surgical Site Infection	6.2	3.4	<0.001
Unplanned Return to OR	2.4	1.8	0.047

NEJM January 29, 2009



# RESEMBLANCE #3 COMMUNICATION

## Challenges:

- Established verbal communication did not close the loop
  - Verbalized organizational communication left un-validated
  - No structure provided on what to communicate
- 

## Good News:

- 3-way communication is an effective technique
- Top performers validate communication flow throughout the organization
- Several tools; PJBs/Turnovers/SAFER conversations

# Health Care Communication Improvement

- Daily Safety Huddles
- Structured Hand-Offs
  - Face-to-Face with the Patient
  - Use of Checklists
- Medication Reconciliation
- Read Back Protocols
- SBAR
  - Situation
  - Background
  - Assessment
  - Recommendation
- Team STEPPS® (Crew Resource Management)

# THE HOLY GRAIL “SAFETY CULTURE”

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# A Call for High Reliability

THE QUALITY JOURNEY

By Mark R. Chassin and Jerod M. Loeb

## The Ongoing Quality Improvement Journey: Next Stop, High Reliability

DOI: 10.1377/hlthaff.2011.0076  
HEALTH AFFAIRS 30,  
NO. 4 (2011): 559-568  
©2011 Project HOPE—  
The People-to-People Health  
Foundation, Inc.

**ABSTRACT** Quality improvement in health care has a long history that includes such epic figures as Ignaz Semmelweis, the nineteenth-century obstetrician who introduced hand washing to medical care, and Florence Nightingale, the English nurse who determined that poor living conditions were a leading cause of the deaths of soldiers at army hospitals. Systematic and sustained improvement in clinical quality in particular has a more brief and less heroic trajectory. Over the past fifty years, a variety of approaches have been tried, with only limited success. More recently, some health care organizations began to adopt the lessons of high-reliability science, which studies organizations such as those in the commercial aviation industry, which manage great hazard extremely well. We review the evolution of quality improvement in US health care and propose a framework that hospitals and other organizations can use to move toward high reliability.

**Mark R. Chassin** (mchassin@jointcommission.org) is president of the Joint Commission, in Oakbrook Terrace, Illinois.

**Jerod M. Loeb** is executive vice president for health care quality evaluation at the Joint Commission.

**Leadership**

**High  
Reliability**

**Trust**

**RPI**

**Improve**

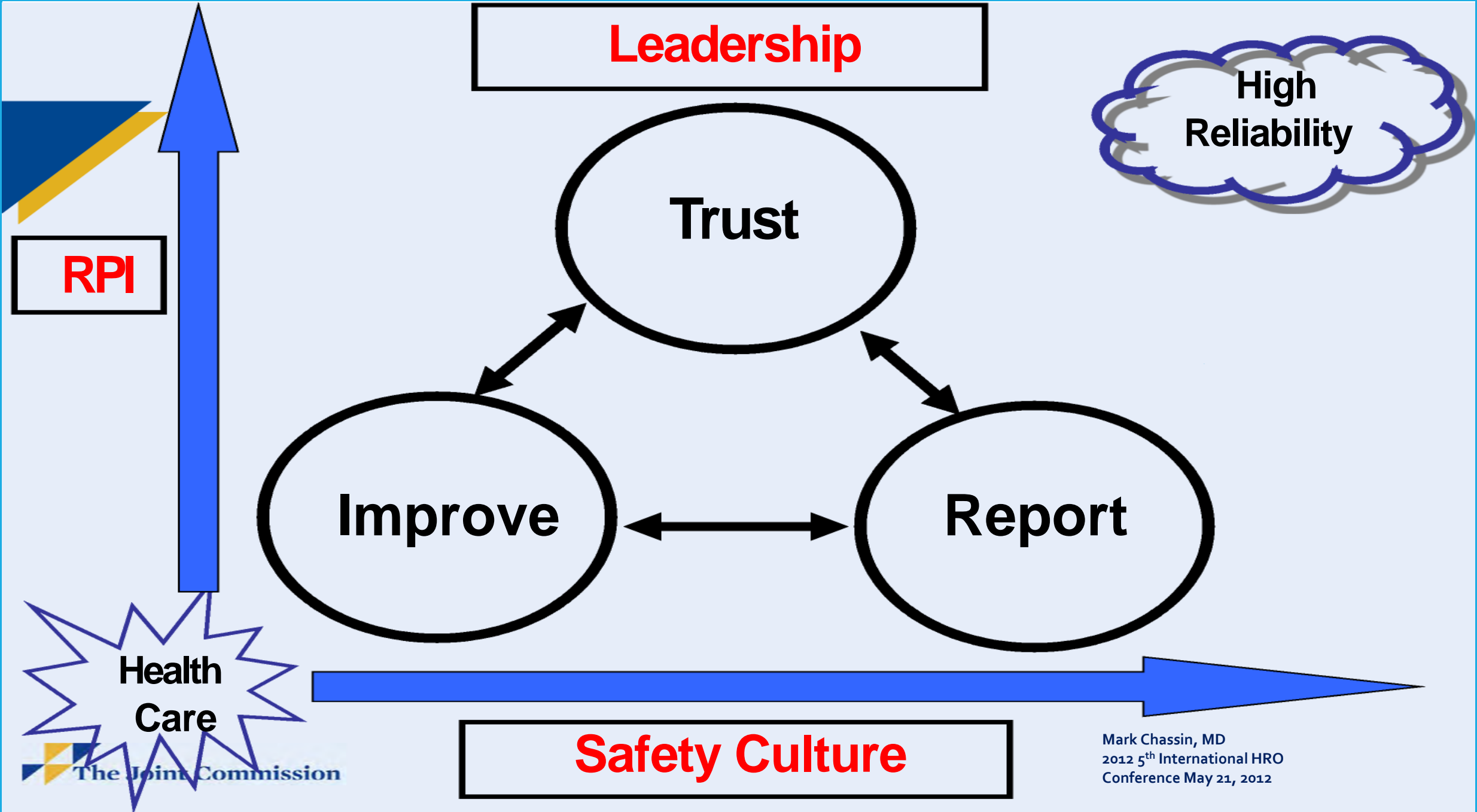
**Report**

**Health  
Care**

**Safety Culture**

Mark Chassin, MD  
2012 5<sup>th</sup> International HRO  
Conference May 21, 2012

The Joint Commission



# Health Care Reliability

- Cannot show reliable and valid safety statistics!
- Error is too often viewed as a challenge to professionalism and self worth, rather than an opportunity to learn.
- Ongoing training, simulation and team development is often lacking.
- Zero harm is often not the primary focus of leadership.



# Medical Areas for Improvement

- Transposition errors in patient information (administrative)
- Non-approved pens for marking (“it washes off”)
- Not being attentive during the Time-out or Safety Huddle (most prominent)
- Rushing to keep the OR schedule on track
- Pre-Op Nurse needs to be able to STOP the line, if necessary (part of the layers of defense)

# Common Cultural Whole team solutions

- It takes total dedication to your #1 priority (public safety/patient health & safety)
- It takes a release of egos (it's not about competency)
- It takes courage to speak up (e.g. for patient/nuclear safety)
- It takes effective communications (are you sure you were understood?)

# Common Cultural Whole team solutions

- It takes a relentless pursuit and correction of system weaknesses
- It takes practice; using effective tools & techniques
- It takes a dedication to safety over production (managing schedule/time pressure)
- It takes an entire team commitment

# QUESTIONS???

