Leading to Zero: The Key Role of Leadership in the Journey to High- Reliability Organizational and Financial Performance
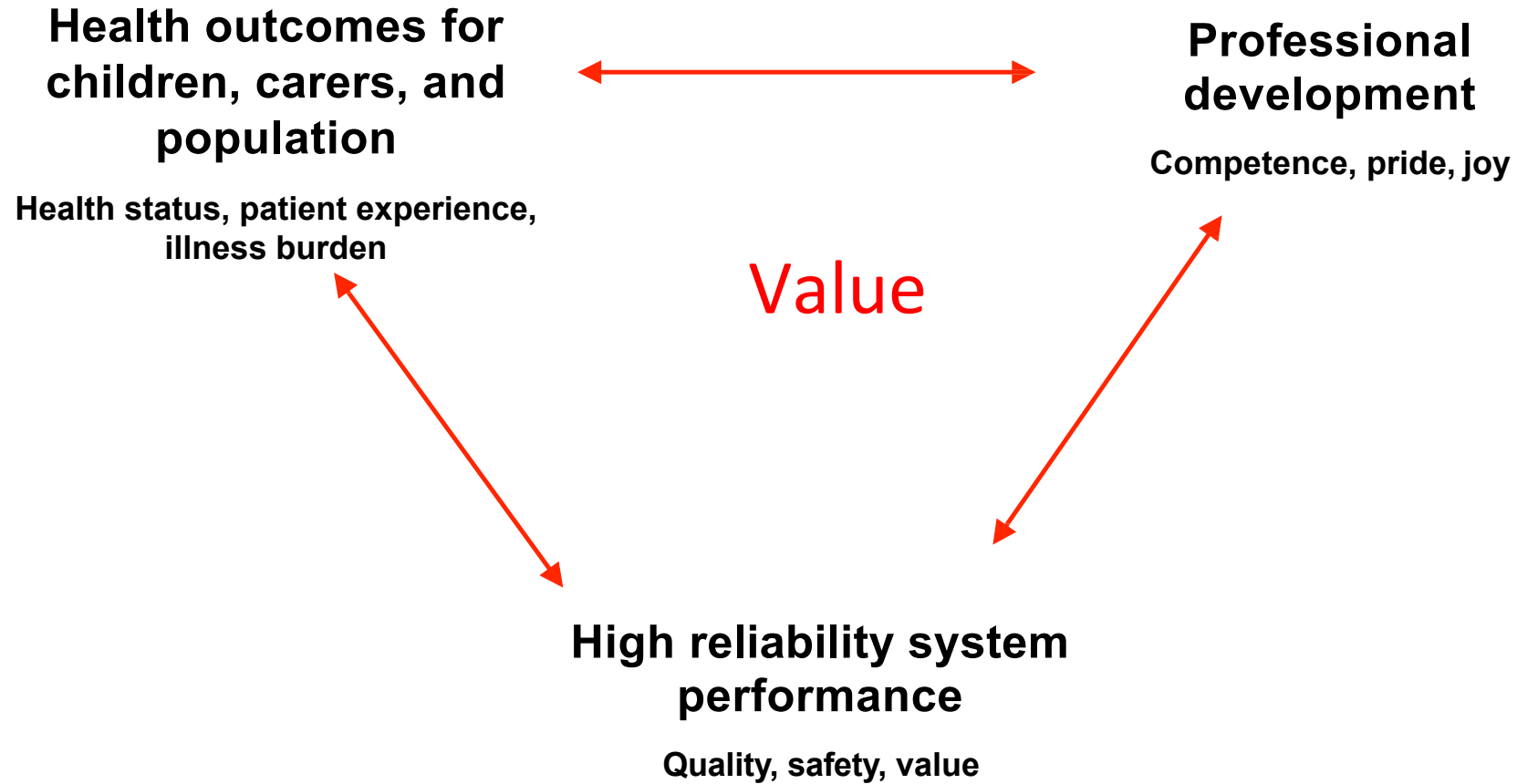
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Senior Advisor, Dean, Jefferson College of Population Health
President, J Bara Innovation

Contact me for slides and papers at PBARACH@gmail.com

Disclosures

None.

Aims of the healthcare delivery system

Health outcomes for children, carers, and population

Health status, patient experience, illness burden

Professional development

Competence, pride, joy

Value

High reliability system performance

Quality, safety, value

Reimbursement is Shifting to Reliability = Clinical Outcomes and Value

	Compliance-Based Payments	Penalty-Based Reductions			Incentive-Based Payments
WHAT	Inpatient Quality Reporting	Hospital-Acquired Conditions (HACs)	Readmissions	Value-Based Purchasing (VBP) *HAIs directly affect your score.*	
HOW	Hospitals that submit data, including HAI data, are eligible for Medicare's annual payment update (APU).	Lowest quartile of hospitals that fail to avoid preventable conditions (e.g., infections) receive a penalty.	Hospitals with excess readmissions are penalized. HAIs linked to a 60% increase in 30-day readmissions.	Low-performing hospitals subject to reductions.	High-performing hospitals eligible to earn money.
FINANCIAL IMPACT	1/4 reduction in your APU	1% reduction	Up to 3% reduction	Up to 2% reduction	Earn up to 2+%

Source: CALHIIN

FY 2019 and FY 2020 Domains and Measures

Safety

1. **CDI**: Clostridium difficile Infection
2. **CAUTI**: Catheter-Associated Urinary Tract Infection
3. **CLABSI**: Central Line-Associated Bloodstream Infection
4. **MRSA**: Methicillin-Resistant *Staphylococcus aureus* Bacteremia
5. **SSI**: Surgical Site Infection Colon Surgery & Abdominal Hysterectomy
6. **PC-01**: Elective Delivery Prior to 39 Completed Weeks Gestation

Efficiency and Cost Reduction

MSPB: Medicare Spending per Beneficiary

Source: CMS

Domain Weights

Safety 25%	Clinical Care 25%
Efficiency and Cost Reduction 25%	Person and Community Engagement 25%

Clinical Care

1. **MORT-30-AMI**: Acute Myocardial Infarction (AMI) 30-Day Mortality Rate
2. **MORT-30-HF**: Heart Failure (HF) 30-Day Mortality Rate
3. **MORT-30-PN**: Pneumonia (PN) 30-Day Mortality Rate
4. **THA/TKA**: Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA) Complication Rate

Person and Community Engagement

HCAHPS Survey Dimensions

1. Communication with Nurses
2. Communication with Doctors
3. Responsiveness of Hospital Staff
4. Communication about Medicines
5. Cleanliness and Quietness of Hospital Environment
6. Discharge Information
7. Care Transition
8. Overall Rating of Hospital

Put your hand up if…

- You have suffered harm as a patient at a hospital or other care facility (i.e, infection, delayed diagnosis, delay in treatmenty, etc)

- A family member has suffered harm in a hospital or other care facility…

- A friend or colleague has suffered harm in a hospital or other care facility..

- You have had to disclose harm or otherwise handle the situation when a patient was harmed in your hospital or other care facility
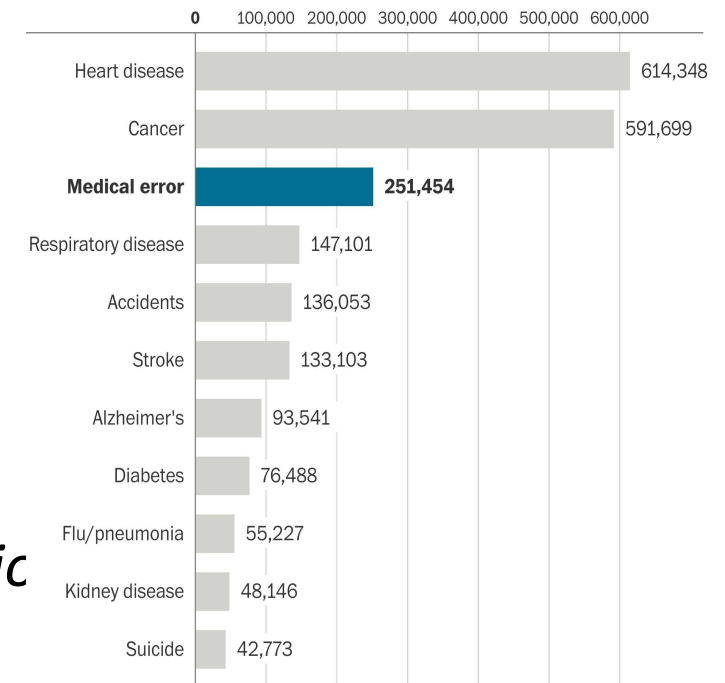
How good are we doing?

Despite continued development and availability of effective practices and guidance, a large body of evidence reveals:

- Significant patterns of under-use of effective interventions (prevention, treatment, management)

- Considerable over-use of ineffective and inappropriate interventions (for which harms exceed benefits)

- An extensive list of "quality gaps" – underuse, overuse, misuse – requiring practice change *(quality improvement, enhanced implementatic*

Death in the United States

Johns Hopkins University researchers estimate that medical error is now the third leading cause of death. Here's a ranking by yearly deaths.

Heart disease	614,348
Cancer	591,699
Medical error	**251,454**
Respiratory disease	147,101
Accidents	136,053
Stroke	133,103
Alzheimer's	93,541
Diabetes	76,488
Flu/pneumonia	55,227
Kidney disease	48,146
Suicide	42,773

Source: National Center for Health Statistics, BMJ

THE WASHINGTON POST

Does the day of the week matter?

ORIGINAL ARTICLES

Mortality After Nonemergent Major Surgery Performed on Friday Versus Monday Through Wednesday

Marc M. Zare, MD,*† Kamal M. F. Itani, MD,*† Tracy L. Schifftner, MS,‡
William G. Henderson, PhD,‡ and Shukri F. Khuri, MD*§

operations performed on Fridays were associated with a higher 30-day mortality rate than those performed on Mondays through Wednesdays:
2.94% vs. 2.18%;
Odds ratio, 1.36; 95% CI, 1.24–1.49)

Adverse Event Rates

Wrong Direction!

1991 **3.7%**	2000 **2.9%**	2010 **5.7%**	2010 **13.1%**	2011 **33.2%**
New York	**Utah and Colorado**	**North Carolina**	**Medicare Beneficiaries**	**IHI Global Trigger Tool**
HMPS, Brennan, Leape, et al.	**Thomas, Studdert, et al.**	**Landrigan et al.**	**Levinson et al.**	**Classen et al.**
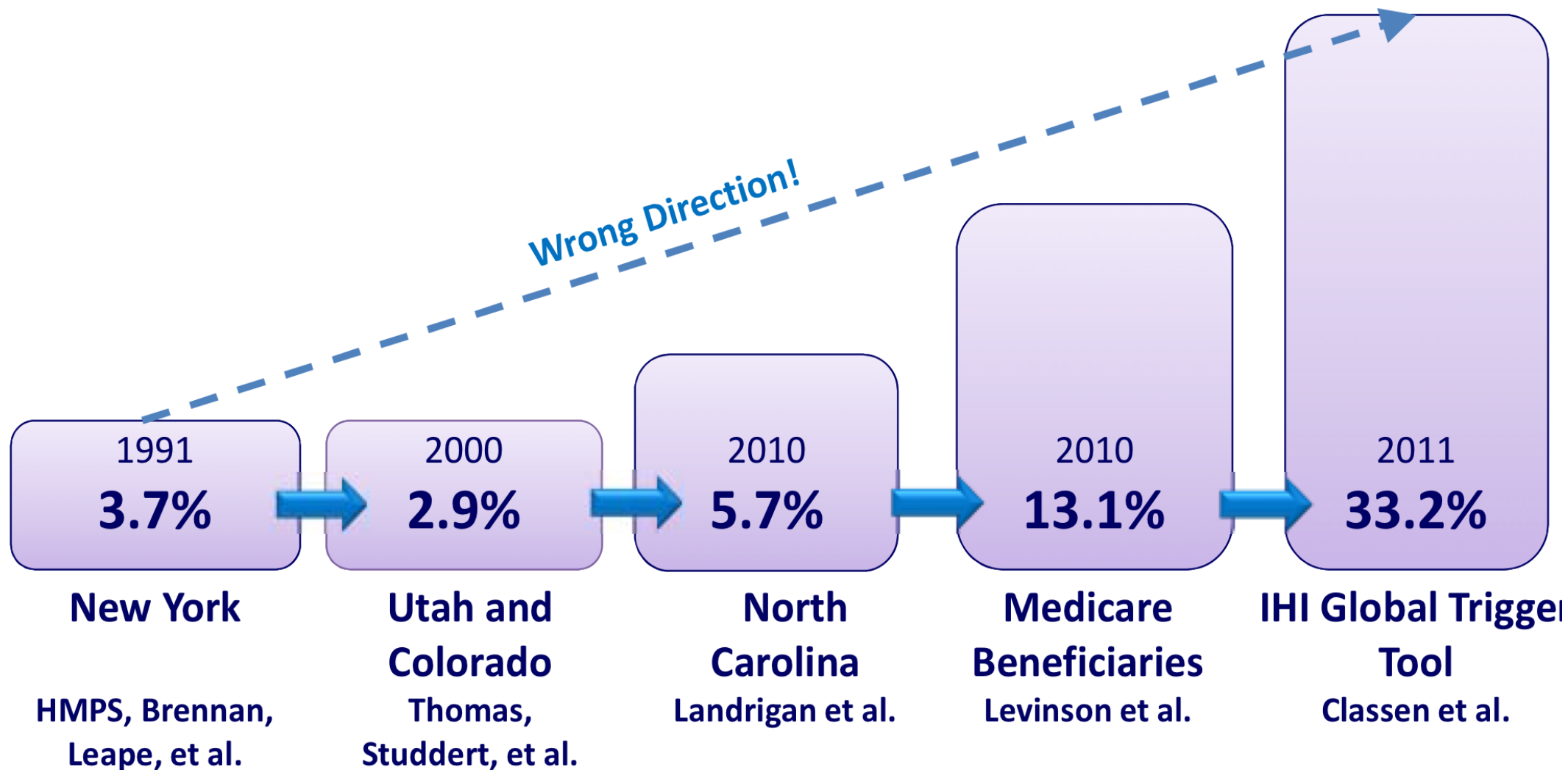
Disclaimer: Studies have different methodology and sample size and cannot be directly compared

Global Quality Status 2018

- 1 in 10 patients harmed in hospital care/ between 5.7 and 8.4 m deaths occurring annually from poor quality care
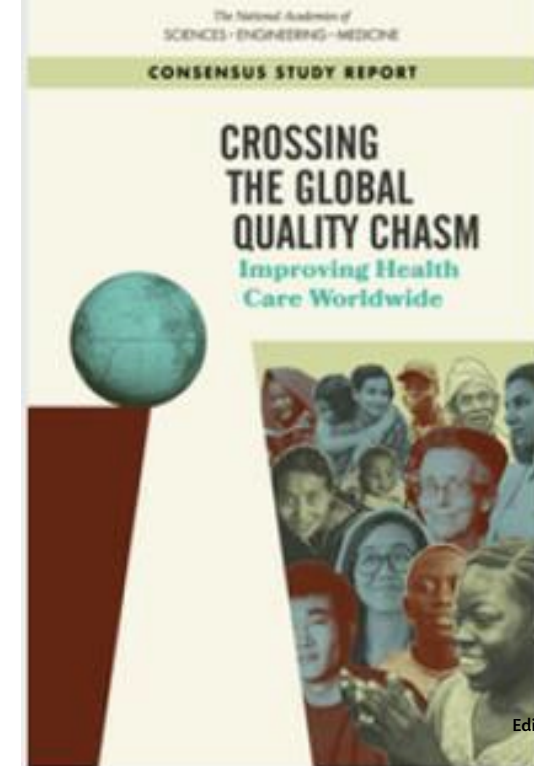
- 14 out of every 100 patients affected by HAI

- 2% patients subject to surgical complications for the 234 million surgical operations performed every year

- 20-40% health spending wasted due to poor quality of care and safety failures

- 15% of hospital costs being due to patient harms caused by adverse event,

CONSENSUS STUDY REPORT

CROSSING THE GLOBAL QUALITY CHASM
Improving Health Care Worldwide

The National Academies of
SCIENCES · ENGINEERING · MEDICINE

THE ECONOMICS OF PATIENT SAFETY IN PRIMARY AND AMBULATORY CARE

Flying blind

Putting quality and people at the centre of health systems

The burden of mortality attributable to poor care is larger than that due to lack of access to care. Significant loss of life could be avoided if measures were put in place to guarantee quality of care. These striking conclusions are the result of the work by Margaret Kruk and colleagues, published in The Lancet, which informed the Commission published by The Lancet Global Health—High-quality health systems in the Sustainable Development Goals era: time for a revolution. Under development for the past 2 years with a team of 30 commissioners led by Kruk and Muhammed Pate, the Commission concludes that without quality health systems are ineffective and Sustainable Development Goal 3—to ensure healthy lives and promote wellbeing for all, at all ages—will not be achieved.

As first set out by Avedis Donabedian in his Milbank Quarterly paper in 1966, an ethical approach towards people is the foundation of a health system's success. Where that ethical commitment is lacking, there can be no high-quality service. And yet, people have become invisible in measurements of quality across health systems worldwide. The focus is on "inputs", even though these are not what matter to patients. Patients are concerned with getting better while being treated with care and respect, otherwise they are unlikely to use health services even if they are nominally accessible.

Throughout the Commission, the underlying argument is that clinical care is too often simply inadequate in low- and middle-income countries (LMICs). Diagnoses are frequently incorrect and are too speedily made. Care itself is slow. Disrespect towards patients is commonplace. Communication with patients is often poor. And abuse of patients is frequent. Additionally, safety is threatened by hazards and injury arising from poor care, financial insecurity, and treatment that is not evidence-led.

Expansion of universal health coverage (UHC) remains essential, but without quality, UHC will be an abstract and meaningless myth. People need to be central to all measures of quality. Assurance of quality should not be limited to health systems and ministries of health but must permeate national infrastructures. Roads and transportation, sanitation, education—for nurses and for doctors—all affect quality, and accountability mechanisms must be put in place to reflect this breadth.
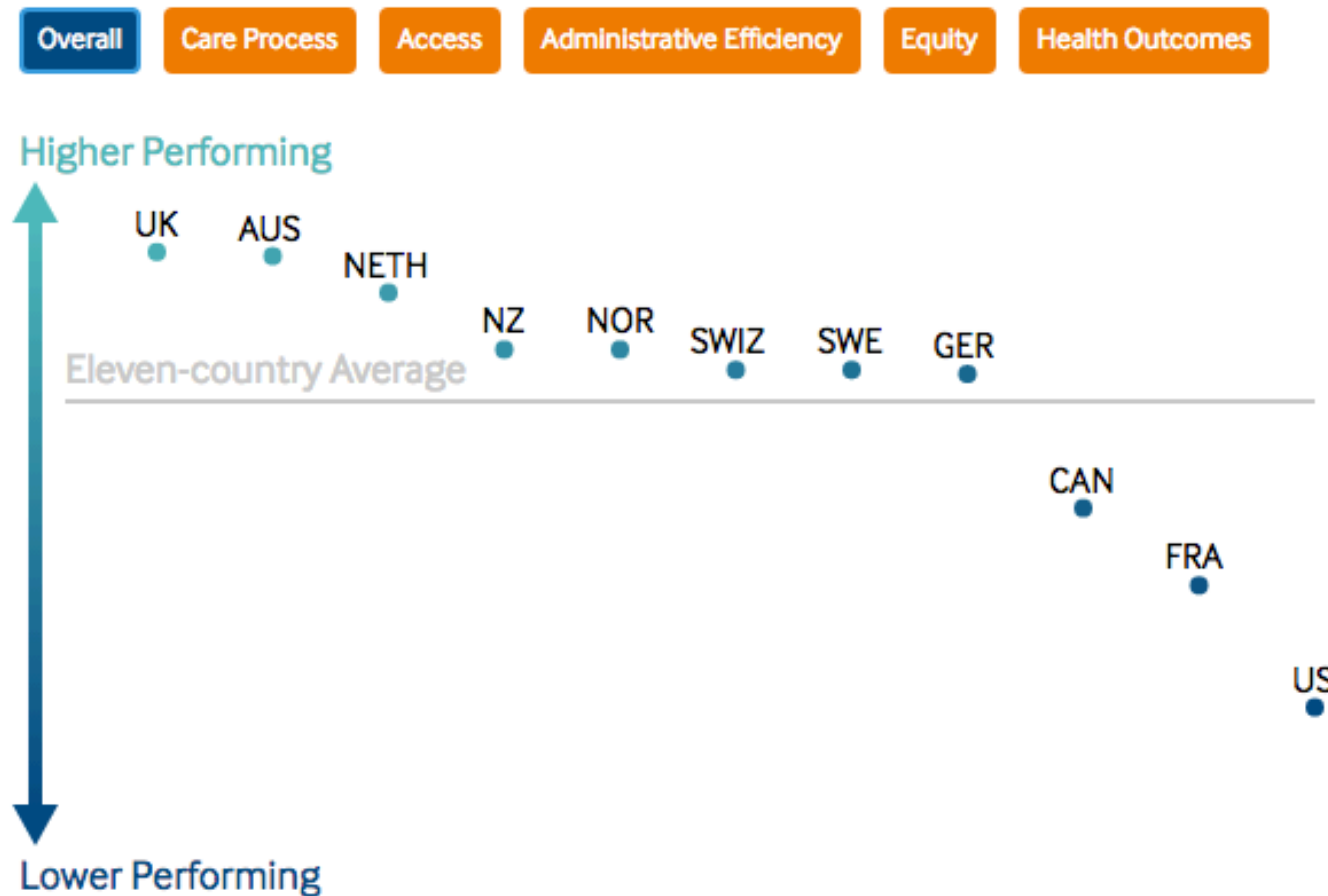
Kruk and colleagues' data show that 5 million lives could potentially be saved through quality improvements. Of the 8·6 million deaths per year in LMICs due to treatable conditions, the remaining 3·6 million deaths occur from lack of access. But expansion of UHC will be ineffective unless quality is addressed. Accountability, trust, and confidence in the health system are all people-led initiatives that will follow with quality improvements. Gaining people's trust takes time, and when health workers and policy makers choose to seek treatment in their own country's public institutions, a signal will be sent that the system can be trusted, and an assurance of safety made. While this lesson could be applied to many cultures and countries, the burden in LMICs is particularly acute, with the threat of poverty adding dangerous consequences to poor quality care.

In both The Lancet Global Health's Commission and the research published in The Lancet, the authors acknowledge that there is no easy or single fix—the systems are complex and multifaceted, and their proposed mechanisms for building people's trust will take widespread cooperation, with accountability and measurement placed at the core. Most quality improvement interventions have, until now, focused on provider-level activities, but today's publications confirm that these are merely peripheral adjustments rather than the complete overhaul of health systems that is needed to incorporate quality into the very fabric of those systems.

Findings from other substantial reports published this year support the findings of the Lancet Global Health Commission. In July, 2018, Delivering Quality Health Services: A Global Imperative for Universal Health Coverage by WHO, the OECD, and the World Bank laid out policy plans for governments and countries. Last week, the US National Academies of Sciences, Engineering, and Medicine published a review of the state of quality in LMICs, Crossing the Global Quality Chasm: Improving Health Care Worldwide. Together, these groups have highlighted and assessed the challenge, provided new data and analyses, and proposed appropriate policy frameworks with people-led needs. The scenery and landscape have been thoroughly and clearly constructed—now the work to turn words into actions must begin. ■ The Lancet

www.thelancet.com Vol 392 September 8, 2018

OECD

Baseline Performance – Healthcare Compared

Exhibit 3. Health System Performance Scores

| Overall | Care Process | Access | Administrative Efficiency | Equity | Health Outcomes |

Higher Performing

UK · AUS · NETH · NZ · NOR · SWIZ · SWE · GER

Eleven-country Average

CAN · FRA · US

Lower Performing

Note: See How This Study Was Conducted for a description of how the performance scores are calculated.

Source: Commonwealth Fund analysis.

How the U.S. Health Care System Compares Internationally

EXHIBIT ES-1. OVERALL RANKING

| COUNTRY RANKINGS											
Top 2*											
Middle											
Bottom 2*											

	AUS	CAN	FRA	GER	NETH	NZ	NOR	SWE	SWIZ	UK	US
OVERALL RANKING (2013)	4	10	9	5	5	7	7	3	2	1	11
Quality Care	2	9	8	7	5	4	11	10	3	1	5
Effective Care	4	7	9	6	5	2	11	10	8	1	3
Safe Care	3	10	2	6	7	9	11	5	4	1	7
Coordinated Care	4	8	9	10	5	2	7	11	3	1	6
Patient-Centered Care	5	8	10	7	3	6	11	9	2	1	4
Access	8	9	11	2	4	7	6	4	2	1	9
Cost-Related Problem	9	5	10	4	8	6	3	1	7	1	11
Timeliness of Care	6	11	10	4	2	7	8	9	1	3	5
Efficiency	4	10	8	9	7	3	4	2	6	1	11
Equity	5	9	7	4	8	10	6	1	2	2	11
Healthy Lives	4	8	1	7	5	9	6	2	3	10	11
Health Expenditures/Capita, 2011**	$3,800	$4,522	$4,118	$4,495	$5,099	$3,182	$5,669	$3,925	$5,643	$3,405	$8,508

Notes: * Includes ties. ** Expenditures shown in $US PPP (purchasing power parity); Australian $ data are from 2010.
Source: Calculated by The Commonwealth Fund based on 2011 International Health Policy Survey of Sicker Adults; 2012 International Health Policy Survey of Primary Care Physicians; 2013 International Health Policy Survey; Commonwealth Fund *National Scorecard 2011;* World Health Organization; and Organization for Economic Cooperation and Development, *OECD Health Data, 2013* (Paris: OECD, Nov. 2013).

Countries, number of hospitals and number of records from Dr Foster GC dataset (2009-15)

Country	Hospitals	Records	Emergency (%)	Elective (%)
England	11	1 334 089	885 864 (66.4)	448 225 (33.6)
Australia	7	575 136	407 807 (70.9)	167 329 (29.1)
USA	12	758 180	431 698 (56.9)	326 482 (43.1)
Netherlands	8	315 165	160 086 (50.8)	155 079 (49.2)
TOTALS	**38**	**2 982 570**	**1 885 455 (63.2)**	**1 097 115 (36.8)**
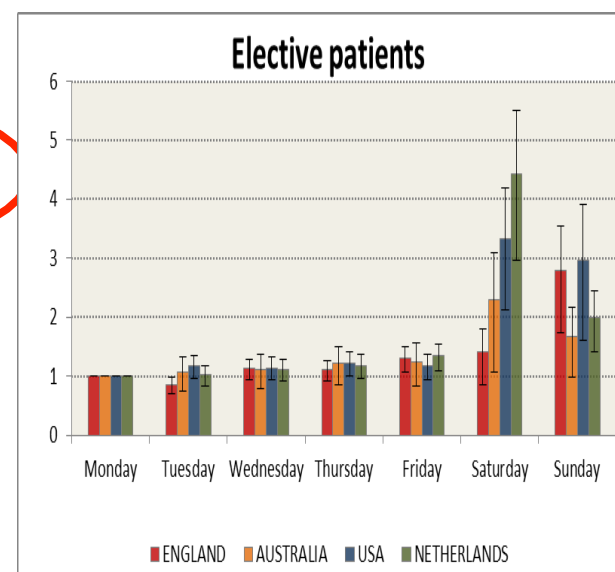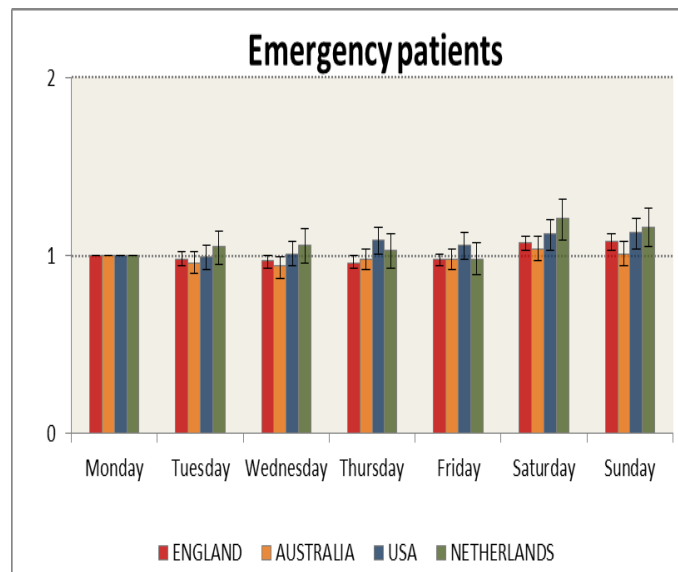
Fifty Healthiest Countries

- Singapore and Cyprus are the only non-OECD countries to rank in top 20
- Israel is the highest ranked country in the Middle East, Chile in Latin America and Slovenia in Eastern Europe

Health index score

■ 62 - 66   ■ 66 - 70   ■ 70 - 74   ■ 74 - 78   ■ 78 - 82   ■ 82 -86   ■ 86 - 90   ■ 90 -94

Iceland
91.21

Luxembourg
87.87

Sweden
88.92

Switzerland
90.75

Spain
89.19

Italy
93.11

Japan
89.15

Israel
88.14

Singapore
90.23

Australia
89.24
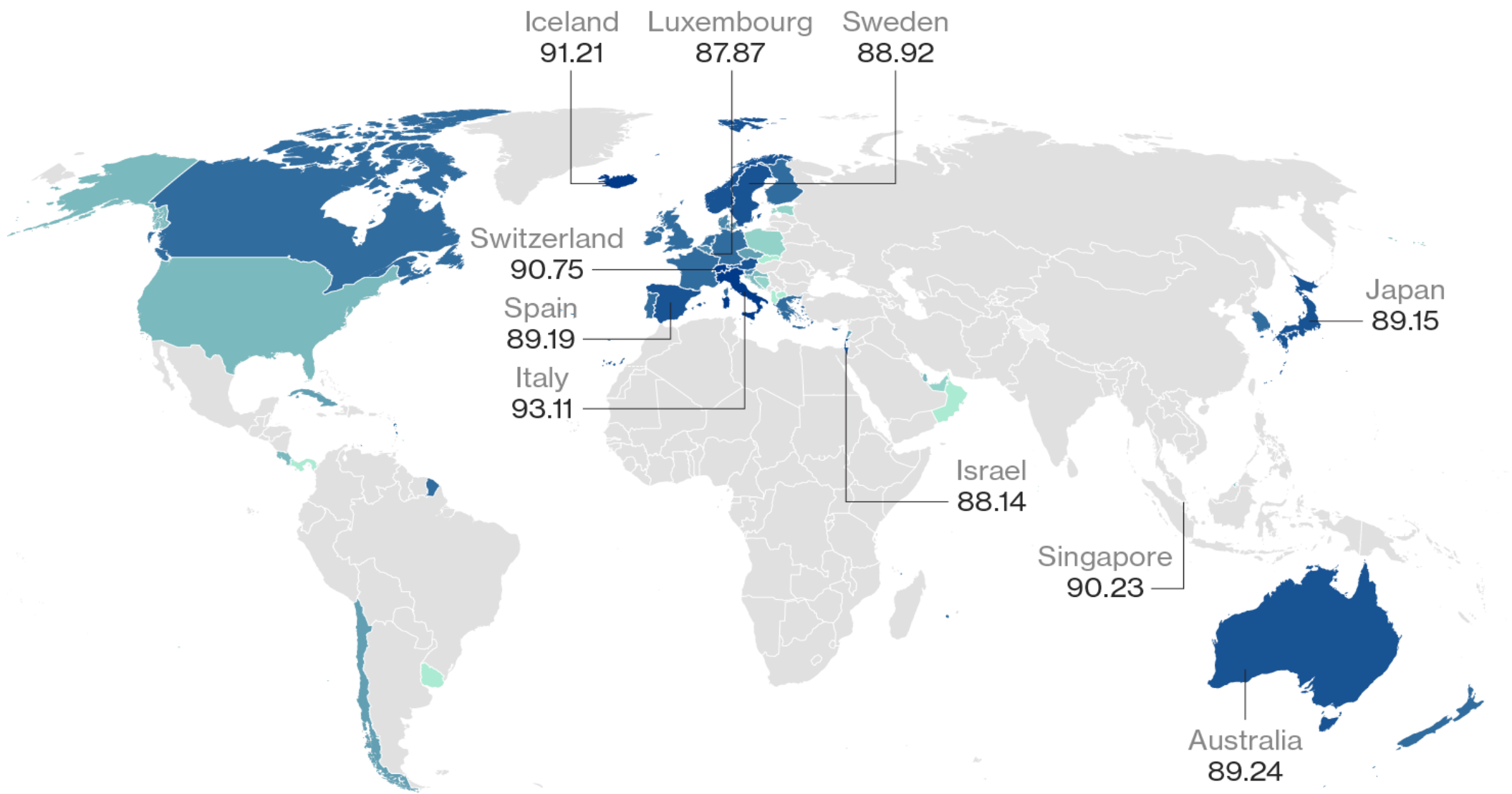
Bloomberg

Bloomberg 2017 Healthiest Country Index

Rank	Country	Health grade	Health score	Health risk penalties	Rank	Country	Health grade	Health score	Health risk penalties
1	Italy	93.11	97.44	−4.33	26	Belgium	80.96	86.03	−5.07
2	Iceland	91.21	96.20	−4.99	27	Slovenia	80.81	86.65	−5.83
3	Switzerland	90.75	94.96	−4.21	28	Denmark	80.36	85.02	−4.66
4	Singapore	90.23	94.11	−3.88	29	Chile	77.18	82.53	−5.35
5	Australia	89.24	93.88	−4.64	30	Czech Rep.	75.76	81.82	−6.06
6	Spain	89.19	94.14	−4.95	31	Cuba	74.23	79.13	−4.90
7	Japan	89.15	93.69	−4.54	32	Lebanon	74.03	79.55	−5.51
8	Sweden	88.92	93.78	−4.85	33	Costa Rica	73.14	77.16	−4.01
9	Israel	88.14	92.47	−4.33	34	U.S.	73.05	78.25	−5.21
10	Luxembourg	87.87	92.90	−5.03	35	Croatia	72.88	78.16	−5.28
11	Norway	86.81	91.61	−4.81	36	Qatar	71.78	77.33	−5.55
12	Austria	86.34	90.78	−4.44	37	Brunei	70.21	75.14	−4.92
13	Netherlands	85.83	89.94	−4.11	38	Estonia	69.24	75.67	−6.43
14	France	85.59	90.93	−5.34	39	Poland	68.92	75.34	−6.42
15	Finland	84.80	89.58	−4.78	40	Bahrain	68.73	74.20	−5.46
16	Germany	84.78	89.40	−4.62	41	Maldives	67.90	71.82	−3.92
17	Canada	84.57	89.53	−4.96	42	Bosnia & H.	67.83	72.91	−5.08
18	Cyprus	84.52	89.17	−4.65	43	U.A.E.	67.30	73.56	−6.26
19	New Zealand	84.48	89.95	−5.47	44	Macedonia	65.64	69.96	−4.32
20	Greece	84.28	88.17	−3.89	45	Uruguay	65.40	70.86	−5.45
21	Portugal	82.97	88.24	−5.27	46	Slovakia	65.10	70.54	−5.44
22	Ireland	82.52	88.53	−6.01	47	Barbados	64.14	68.55	−4.41
23	U.K.	82.28	87.21	−4.94	48	Oman	62.89	67.79	−4.90
24	S. Korea	82.06	87.67	−5.61	49	Panama	62.39	67.13	−4.73
25	Malta	81.27	86.42	−5.15	50	Albania	62.01	66.72	−4.71

Sources: World Health Organization, United Nations Population Division, World Bank

Note: Health grade (X) = Health score (A) - Health risk penalties (B)
A: Health score metrics: 1. mortality by communicable, non-communicable diseases and injuries; 2. life expectancy at the defining age of birth, childhood, youth and retirement; 3. probability to survive neonatal, into young adulthood and retirement stages; B: Health risk penalties: 1. behavioral/endogenous factors such as high incidences of population with elevated level of blood pressure, blood glucose and cholesterol, prevalence of overweight, tobacco use, alcohol consumption, physical inactivity and childhood malnutrition, as well as mental health and basic vaccination coverage; 2. environmental/exogenous factors such as greenhouse gas emissions per capita and percentage of population with access to improved drinking water.

Most recent data used. Of the more than 200 countries and regions evaluated, 163 had enough data to be included in the final outcome; The top 50 are displayed.

Bloomberg

Redesigning Health Systems (what Graham - Cassidy seems to have overlooked)

"The American healthcare delivery system is in need of fundamental change....Healthcare today too frequently harms and routinely fails to deliver its potential benefit.... Between the healthcare we have and the care we should receive lies not just a gap, but a chasm."

The need to improve value in health care

Conclusion:

Our current healthcare "system" could, if not reformed, bankrupt this nation. The United States is the only country that writes a blank check for health care.
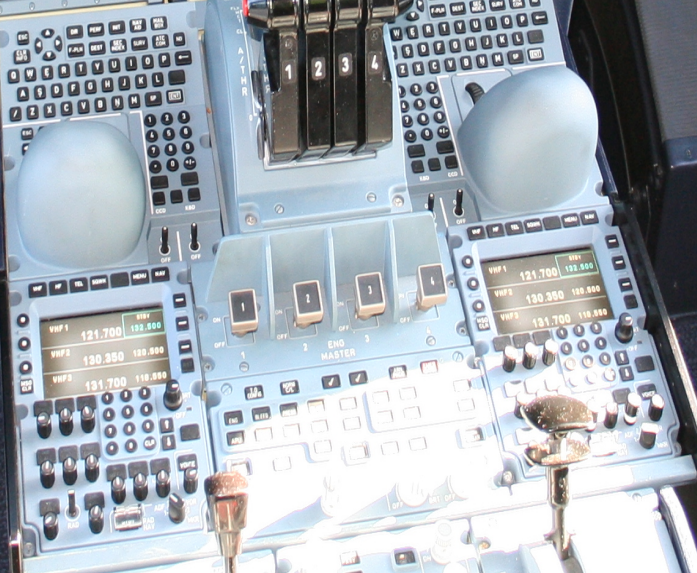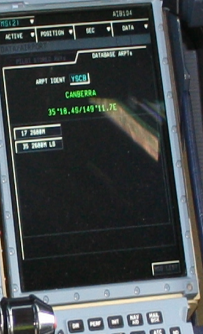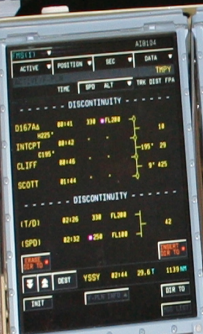
David Walker, CEO
Peterson Foundation
IOM Roundtable, 2010

Highly Reliable Industries

18

Projected Hull Loss -
Assuming Current Accident Rate Does Not Decline
But Traffic Increases as Forecast
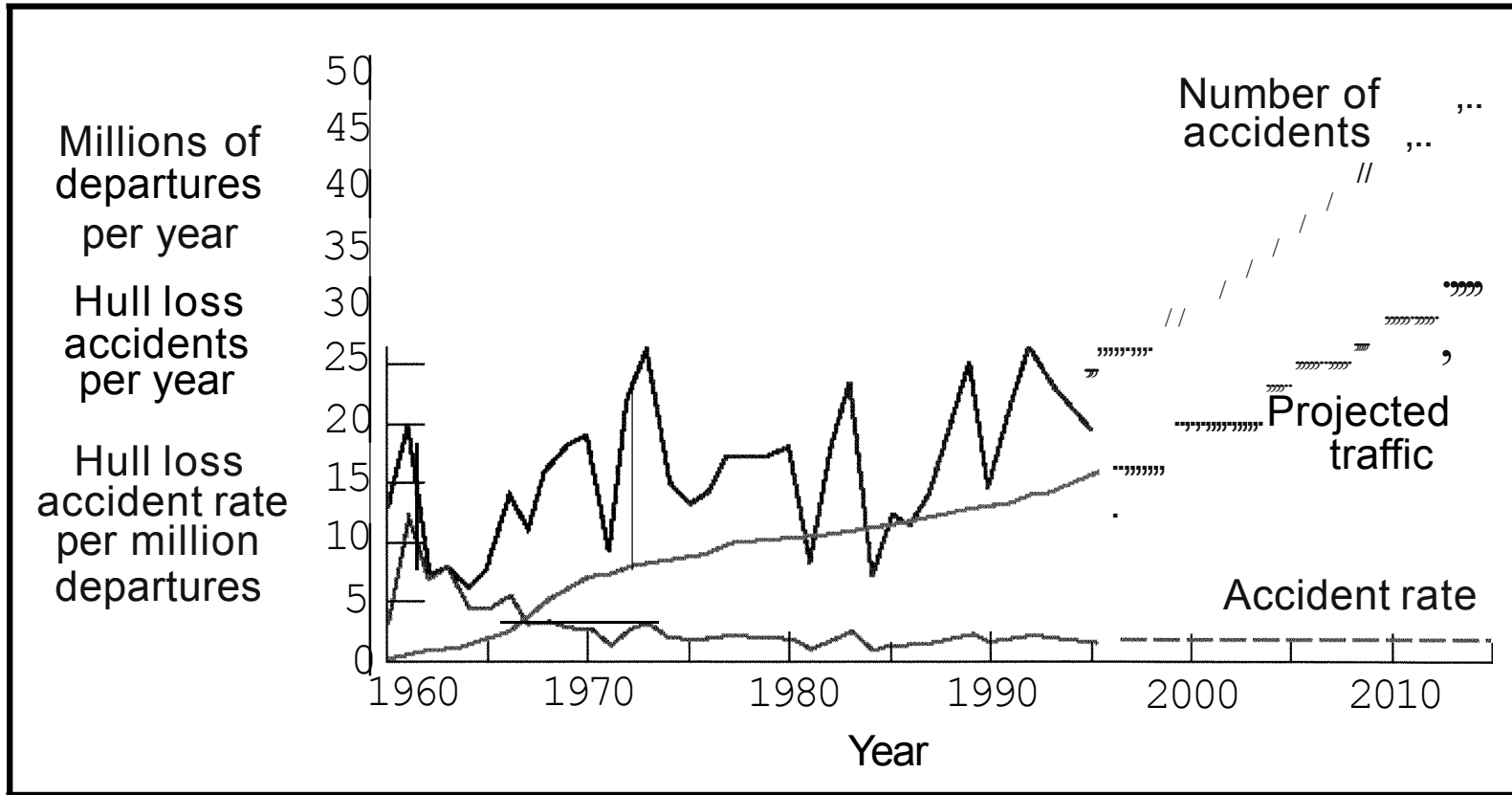
How Safe are US Airlines?

- 1990-2001
  - 129 deaths per year
  - 9.3 million flights per year
  - Rate = 13.9 deaths per million flights
- 2002-2017
  - 18 deaths per year
  - 10.6 million flights per year
  - Rate = 1.74 deaths per million flights

= 87%↓

- 2017—first year where no commercial passenger jet fatalities.

- The fatal accident rate estimated for large commercial passenger flights is 0.06 per million flights, or one fatal accident for every 16 million flights.

Nuclear Energy Institute Data
1985-2010
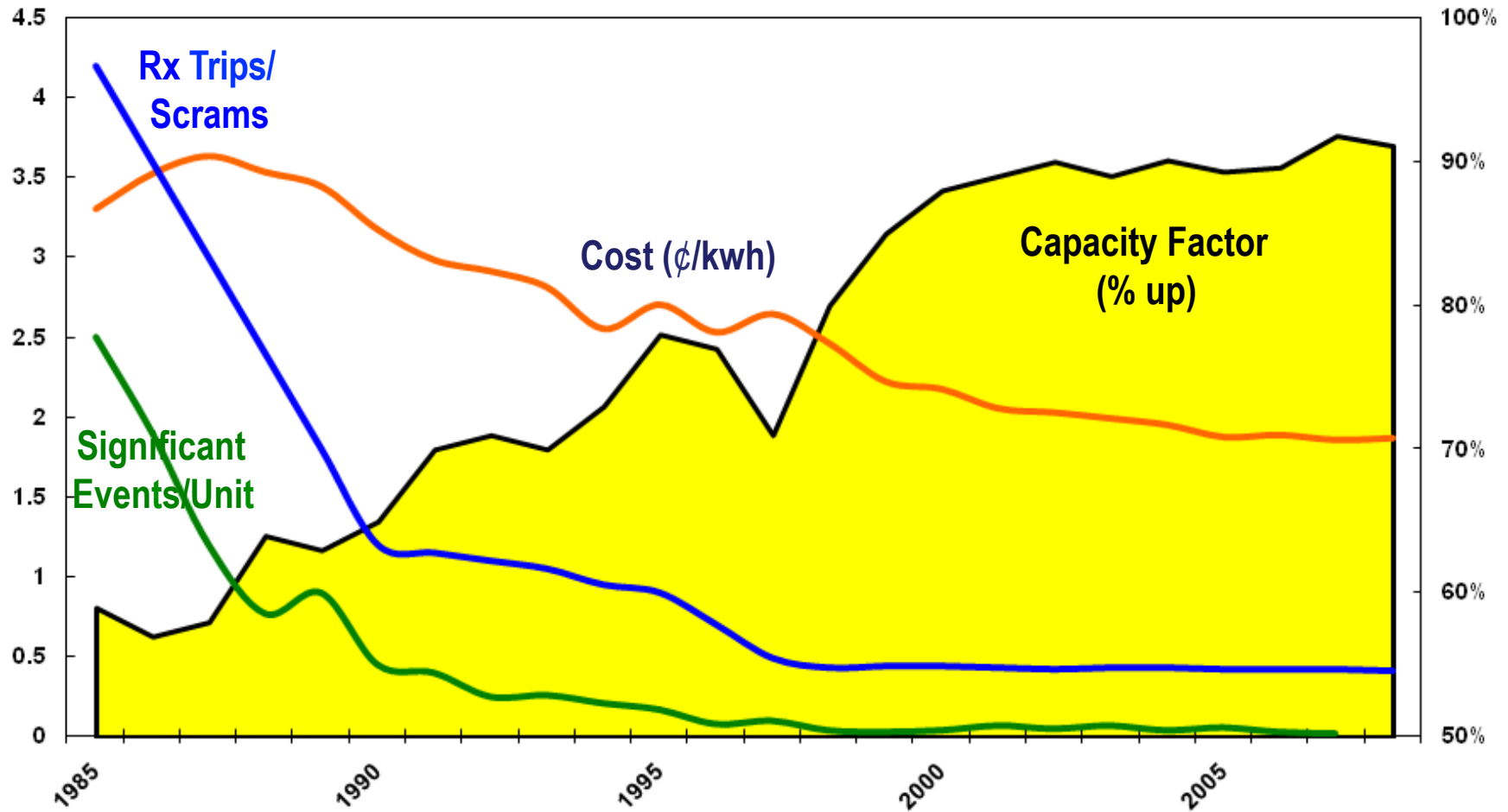
The likelihood of being injured seriously enough to require overnight hospitalization for treatment is 1 in 24 million. The chance of being fatally injured is 1 in 750 million. (Based on an average of five rides per guest.)

Five Barriers to Achieving Ultrasafe Healthcare
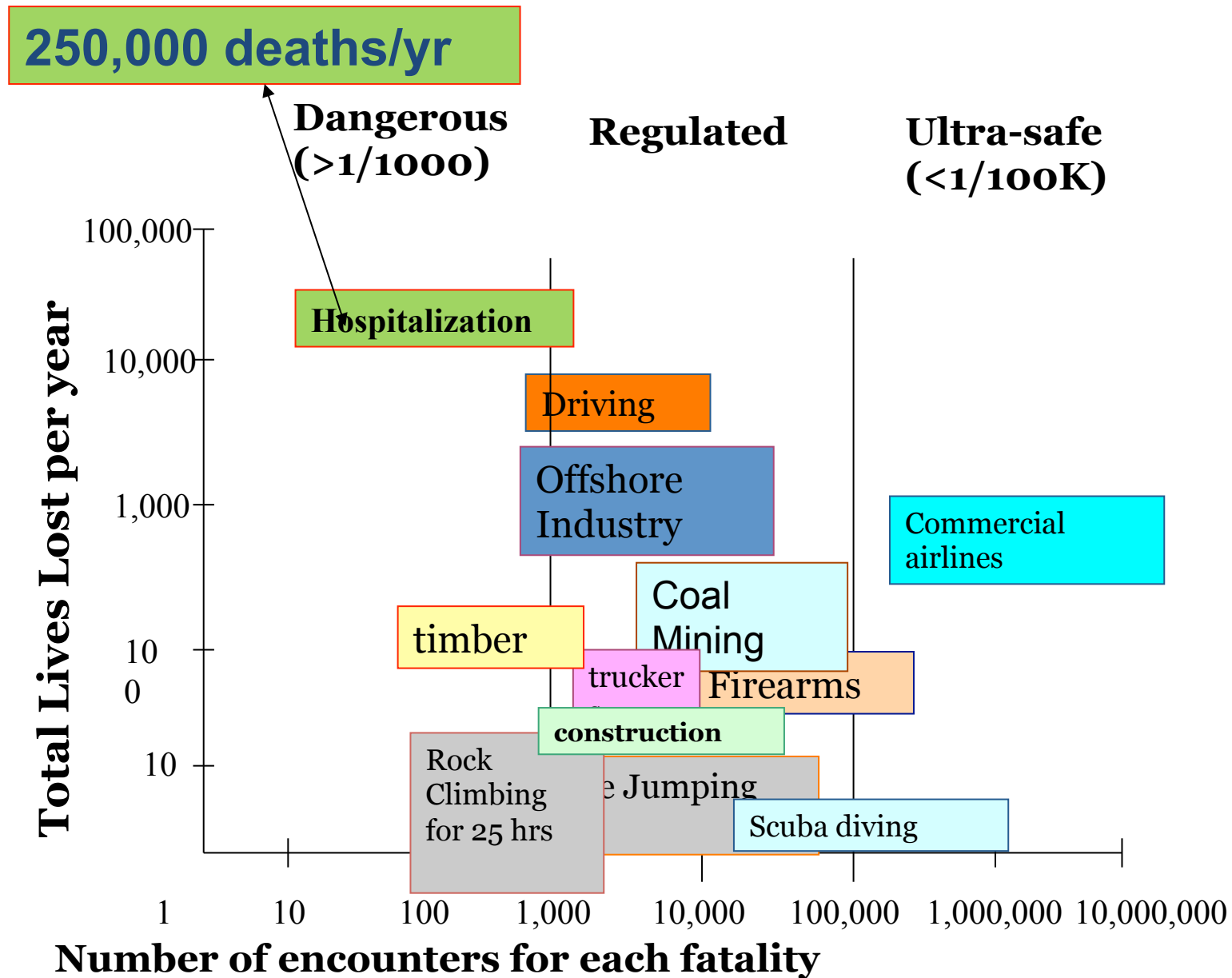
Amalberti, R., Auroy, Y., Berwick, DM, Barach. P. Five system barriers to achieving ultra-safe health care. *Annals of Intern Med*. 2005;142(9):756-64.

24

Which specialties are the most burned out?

Medscape 2017 survey

Burnout = loss of enthusiasm for work, feelings of cynicism, and a low sense of personal accomplishment
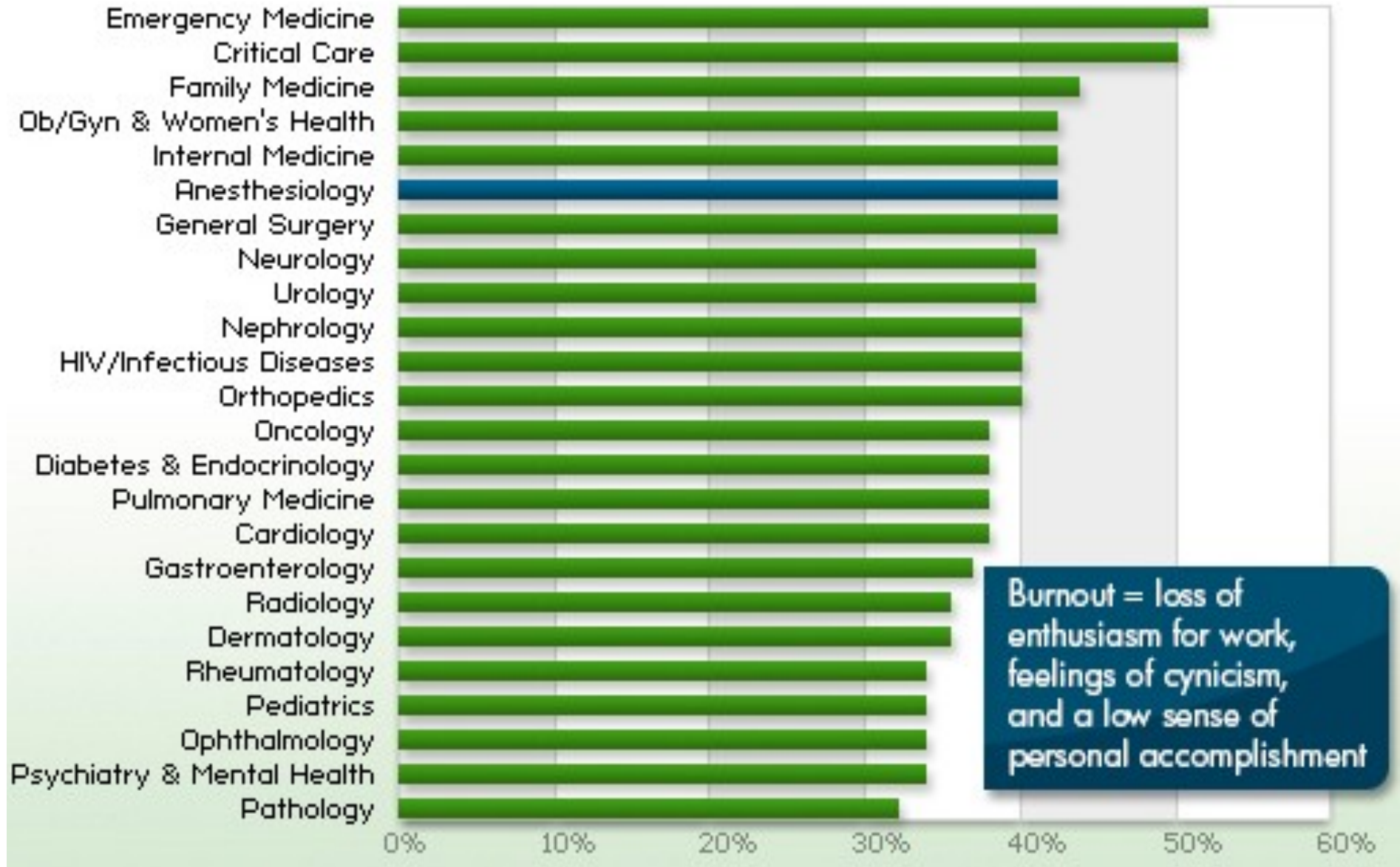
The Flight to High Reliability: Adapting High Reliability Science to Hospitals

Photo © Marine nationale
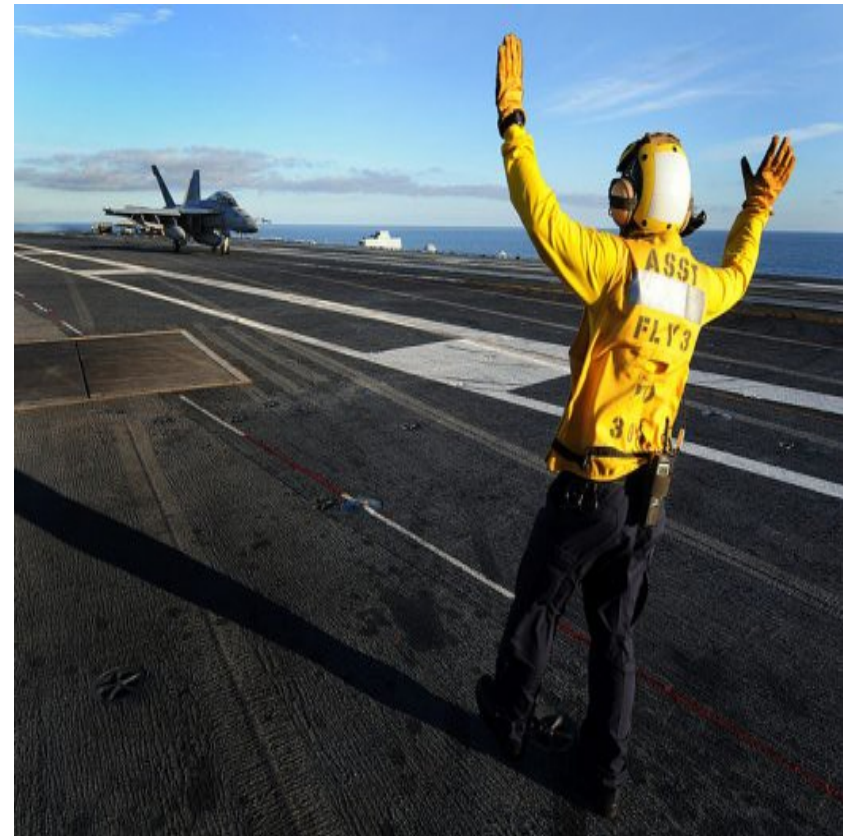
Dr. W. Edwards Deming: System of Profound Knowledge

W. Edwards Deming

- Appreciation for a System
- Understanding Variation
- Theory of Knowledge
- Psychology

"The various segments of the system of profound knowledge cannot be separated. They interact with each other."

What is a System?

■ A system is "a network of interdependent components that work together to accomplish a shared aim"

– Every system has an aim (no aim, no system)

– Every system must be managed

– Management requires "knowledge of the interrelationships between all the components within the system and the people who work in it"

Reason – Systems Engineering
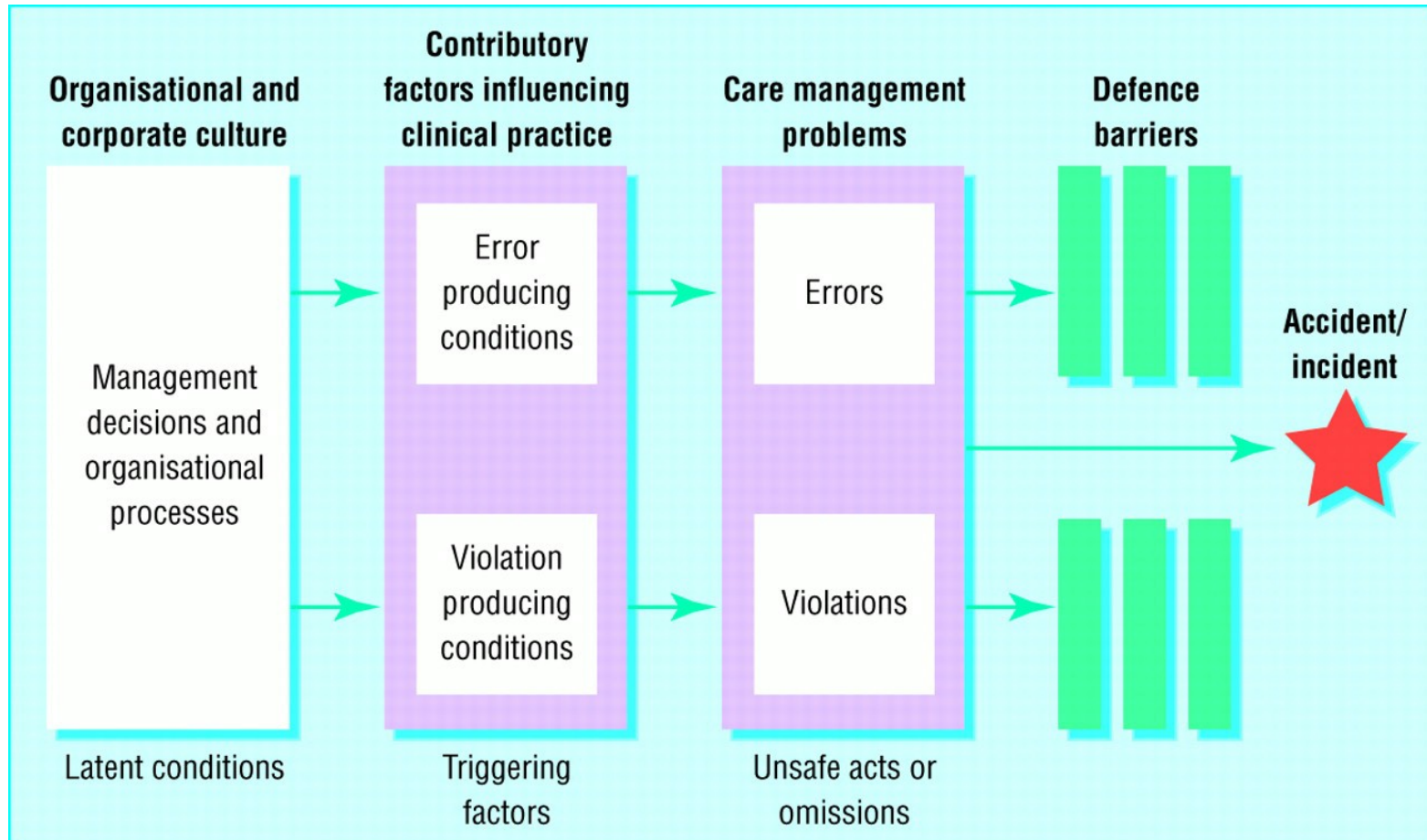
A Human Factos Model to Assess Systems Safety (SEIPS 2.0 Model/Carayon et al)
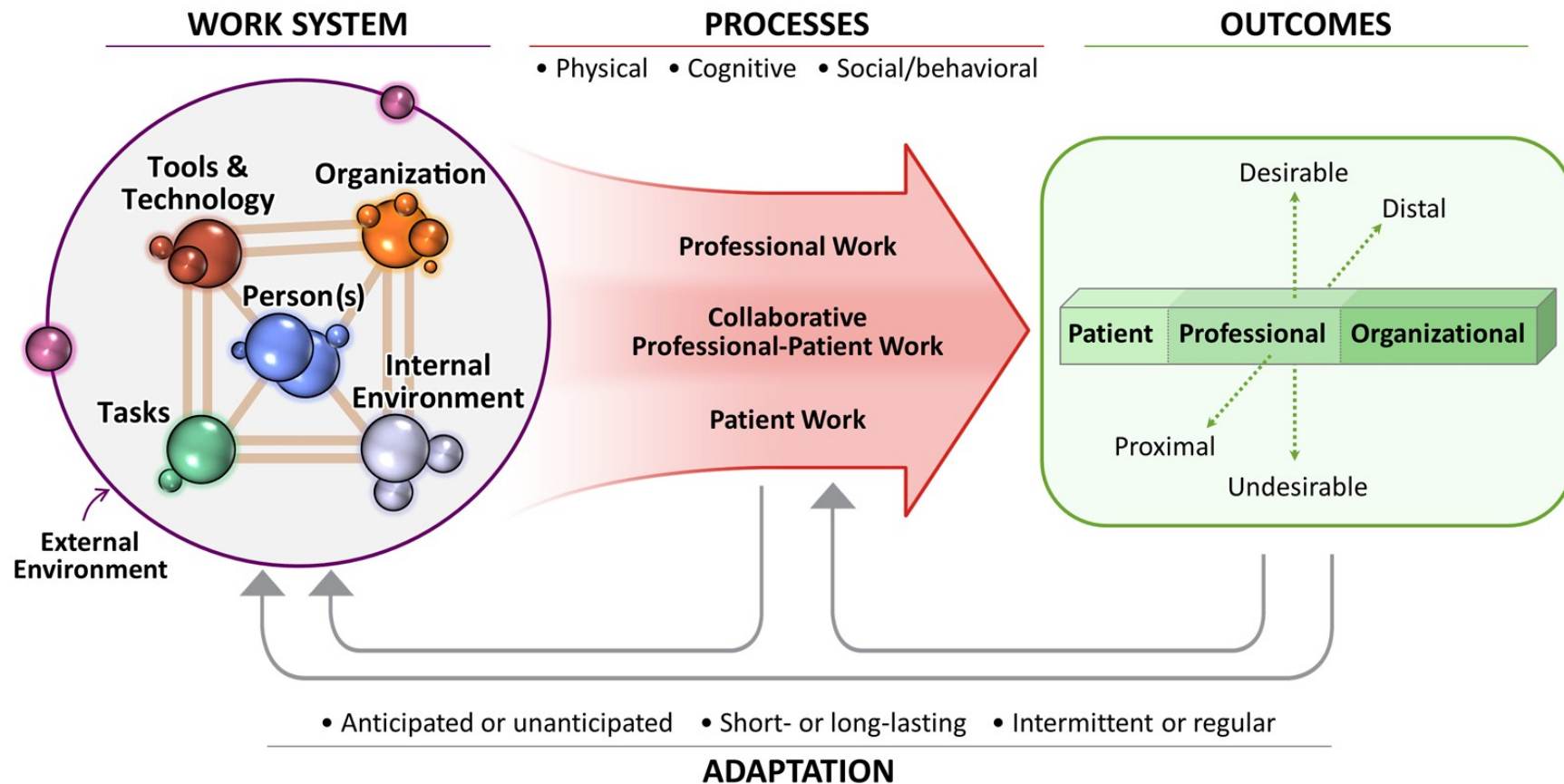
Figure 1.
SEIPS 2.0 model.

High Reliability Definitions

Reliability – A probability that a system will yield a specified result.

HRO – An organization that is involved in a

- complex and high risk environment that delivers exceptionally safe and consistently high quality service/care over time.

- Conducting relatively error free operations
  – Over a long period of time
  – Making consistently good decisions resulting in
  – High quality and reliability operations

High Reliability– Five Key Concepts

- **Sensitivity to Operations (situational awareness)**
  - Focus on systems and processes and how they affect patient care.
- **Reluctance to Simplify**
  - Systems are made simple, but the explanation for failure is rigorously pursued and understood. (**Take nothing for granted.**)
- **Preoccupation with Failure**
  - Relentless pursuit of perfection and a constant search for what might go wrong. (**Focus on timely notification and evaluation of near misses.**)
- **Deference to Expertise**
  - Information is freely shared and staff are engaged at all levels.
  - In a crisis, the person with the most expertise leads.
- **Resilience**
  - The organization quickly contains and mitigates errors.

December 29, 2001 - As the sun rises on the deck of USS John C. Stennis (CVN 74), the ship is readied for flight operations. Stennis and her embarked Carrier Air Wing Nine (CVW-9) are supporting Operation Enduring Freedom. U.S. Navy photo by Photographer's Mate 3rd Class Jayme Pastoric.

An HRO must sustain a "mindful infrastructure" which

1. Observes and tracks small failures and anomalies

2. Resists oversimplification

3. Remains sensitive to operations

4. Maintains capabilities for resilience

5. Looks to expertise not rank to inform decisions

Principles of anticipation

Principles of containment

High Reliability Organizations: Collective Mindfulness

- A mental orientation that enables continuous learning and continuous evaluation of the environment for the expected and unexpected.

- Leaders at all levels constantly think in terms of how the organization can become better and avoid error.

- Anticipation for events that may produce harm combined with containment once an unexpected event has occurred to prevent or minimize harm.

Mindful vs Mind-less-ness

- "To be mind-ful is to have a rich awareness of discriminatory detail and an enhanced ability to discover and correct errors that could escalate into a crisis"
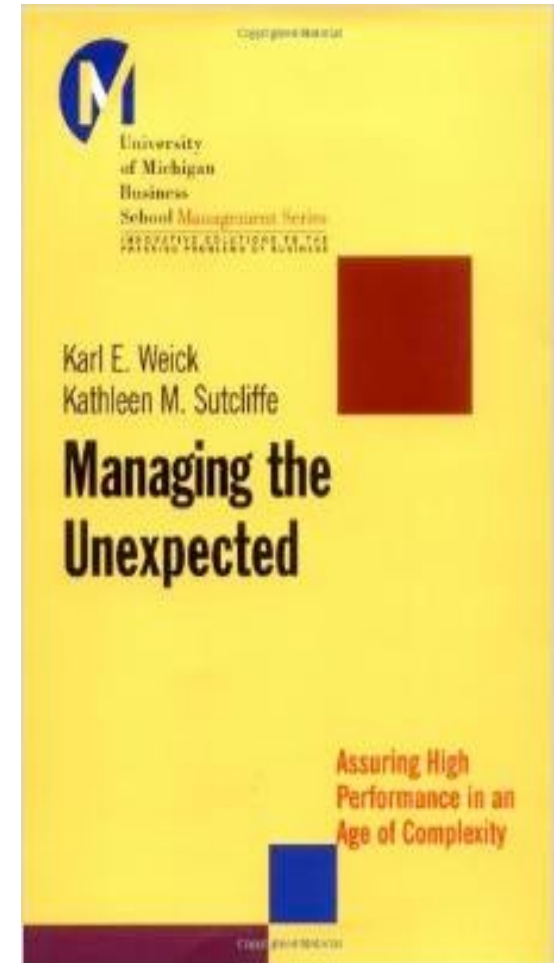
Deepwater Horizon—the role of culture and management?

- "The true cause of most disasters is not so much the initial accident but the failure to identify the accident early in its birth." Sidney Dekker

- The blowout of BP's Macondo Prospect well was a case study in how a series of small mistakes and misjudgments, when not caught in time, can snowball into catastrophe.

Reliability Principles

- Relentless measurement of performance to evaluate, calculate, and improve the overall reliability of a complex system

- Optimizing and standardizing hospital design AND operational processes

- Responsibility and accountability of staff

- A transparent culture devoted to quality

1) Observe and track small failures and anomalies

- Worry chronically about errors.

- Assume each day is a bad day.

- Difficult to do.

- "Collective bonds among suspicious people."

A deviation from generally accepted performance standards that…

Serious Safety Event
- Reaches the patient
- Results in moderate to severe harm or death

Precursor Safety Event
- Reaches the patient
- Results in minimal harm or no detectable harm

Near Miss Safety Event
- Does not reach the patient
- Error is caught by a detection barrier or by chance

Serious Safety Events

Precursor Safety Events

Near Miss Safety Event

Human Factors Approach

SOCIETAL, CULTURAL & REGULATORY INFLUENCES

ORGANISATIONAL & MANAGEMENT BEHAVIOUR

TEAM & GROUP BEHAVIOUR

INDIVIDUAL BEHAVIOUR

WORK ENVIRONMENT

PATIENT

Policies, safety programs, paternalism

Group processes, co-operation

Coping with fatigue & stress

Leadership

Decision making;

Communication, co-ordination

Management involvement & commitment

Situation awareness

Team working, cohesiveness, team culture, leadership, discipline

Safety culture, management style, training

THE **DESIGN** OF **EVERYDAY THINGS**

previously published as THE PSYCHOLOGY OF EVERYDAY THINGS

DONALD A. NORMAN

"If an error is possible, someone will make it. The designer must assume that all possible errors will occur and design so as to minimize the chance of the error in the first place, or its effects once it gets made"

Norman, The Design of Everyday Things, 2001

Human factors and design thinking are about designing innovative technologies, workplace settings, organizational culture and the equipment to fit people and accommodate for limitations of human performance

Engine for Improvement

Model for Improvement

What are we trying to accomplish?

How will we know that a change is an improvement?

What change can we make that will result in improvement?
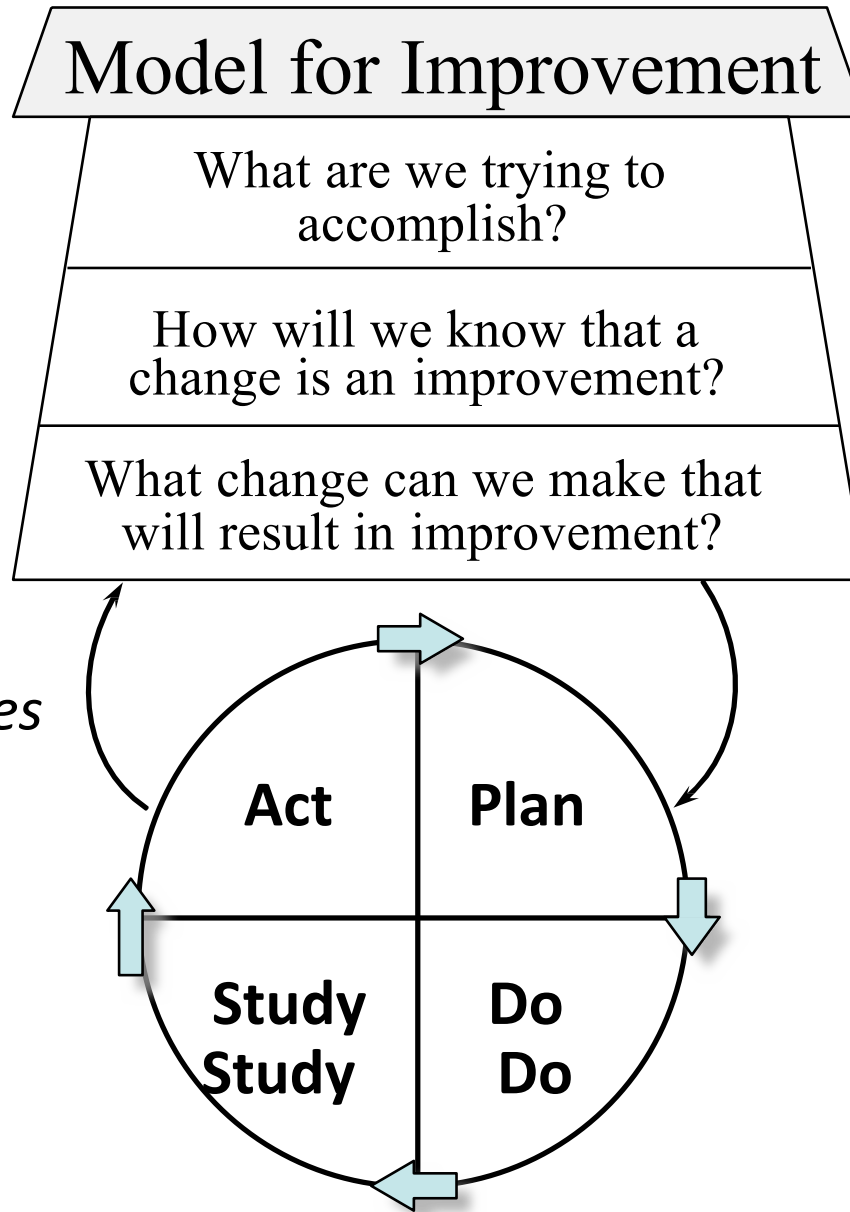
The Model encourages you to act your way into learning, rather than thinking your

Act

Plan

Study Study

Do Do

Lloyd Provost, API

2) Resist oversimplification

- All organizations must ignore many things.
- Doing so may force them to ignore key sources of problems.
- Restrain temptations to simplify.
- Through checks and balances, adversarial reviews, and multiple perspectives.

Instrument fixation?
Asiana Airlines, San Francisco, Flight 214, July 6, 2013

The NTSB reached the following final conclusion:

The National Transportation Safety Board determines that the probable cause of this accident was the flight crew's mismanagement of the airplane's descent during the visual approach, the pilot flying's unintended deactivation of automatic airspeed control, the flight crew's inadequate monitoring of airspeed, and the flight crew's delayed execution of a go-around after they became aware that the airplane was below acceptable glidepath and airspeed tolerances.

Contributing to the accident were (1) the complexities of the auto-throttle and autopilot flight director systems that were inadequately described in Boeing's documentation and Asiana's pilot training, which increased the likelihood of mode error; (2) the flight crew's nonstandard communication and coordination regarding the use of the auto-throttle and autopilot flight director systems; (3) the pilot flying's inadequate training on the planning and executing of visual approaches; (4) the pilot monitoring/instructor pilot's inadequate supervision of the pilot flying and alarm mismanagement; and (5) flight crew fatigue, which likely degraded their performance.

3) Remain sensitive to operations

- Pay close attention to operations.

- Everyone values organizing to maintain situational awareness.

- Use resources so people can see and comprehend what is happening.
  (sense-making)

Lessons from Nuclear Power and Aviation

~~Technology~~
~~Training Regimes~~

- **Process Organisation**
  - Task Allocation
  - Task sequence
  - Discipline and composure

- **Teamwork**
  - Leadership
  - Involvement
  - Briefing

- **Threat and Error Management**
  - Checklists
  - Predicting and Planning
  - Situation Awareness
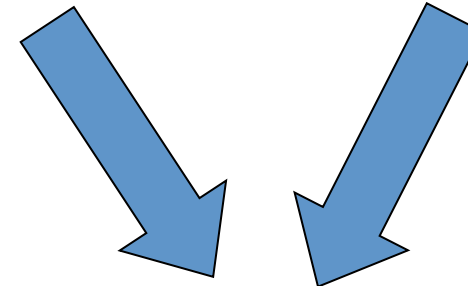
4) Maintain capabilities for resilience

- Developing capabilities to detect, contain, and bounce-back from events that do occur.

- Anticipate trouble spots.

- Capability to improvise.

- Improve capacity to
  - Do quick studies
  - Develop swift trust
  - Engage in just-in-time learning

Safety I and Safety II thinking

Safety-I = Reduced number of adverse events.

Focus is on what goes wrong. Look for failures and malfunctions. Try to eliminate causes and improve barriers.

Safety and core business compete for resources. Learning only uses a fraction of the data available

$10^{-4} := 1$ failure in 10.000 events
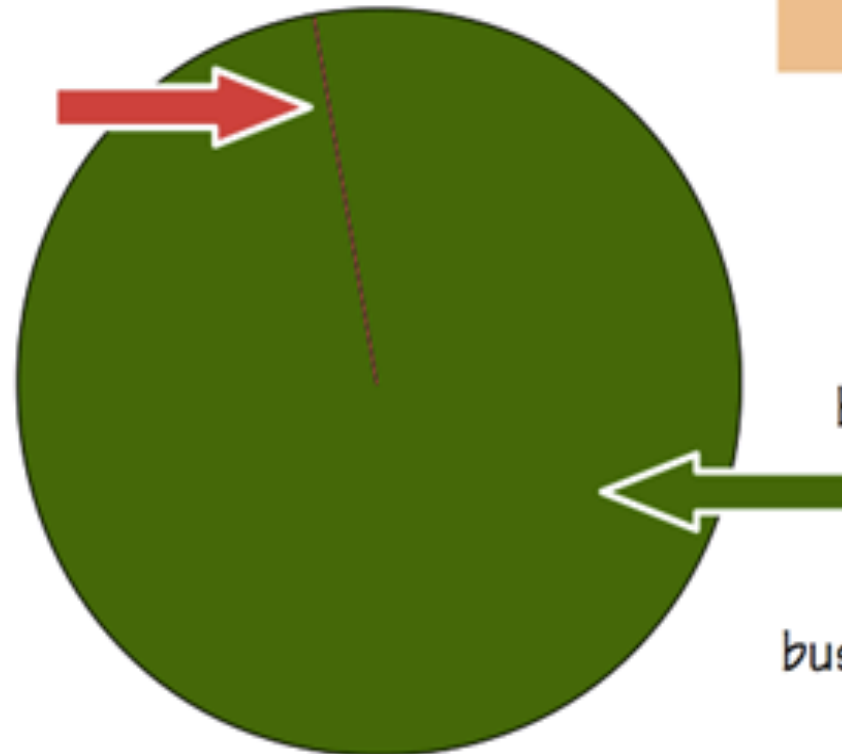
$1 - 10^{-4} := 9.999$ non-failures in 10.000 events

Safety-II = Ability to succeed under varying conditions.

Focus is on what goes right. Use that to understand everyday performance, to do better and to be safer.

Safety and core business help each other. Learning uses most of the data available

Failure Mode and Effects Analysis the Right Way & the Healthcare Way

HRO Starts FMEA

Healthcare Starts FMEA

Conceptual Design and Approval

Prototype

Piloting & First Assembly Dry Run

"Open the Door"

Planning and Definition

Service Design and Development

Process Design and Development

Quality & Process Validation

Pilot – Controlled Variable

Pilot – Stress test

Pilot – All Variables "Full Dress"

Full Production

Bad Event

System FMEA   Design FMEA   Design FMEA

Process FMEA

Non-Technical Skills

Model of "Big 5" Teamwork/TEAMSTEPPS
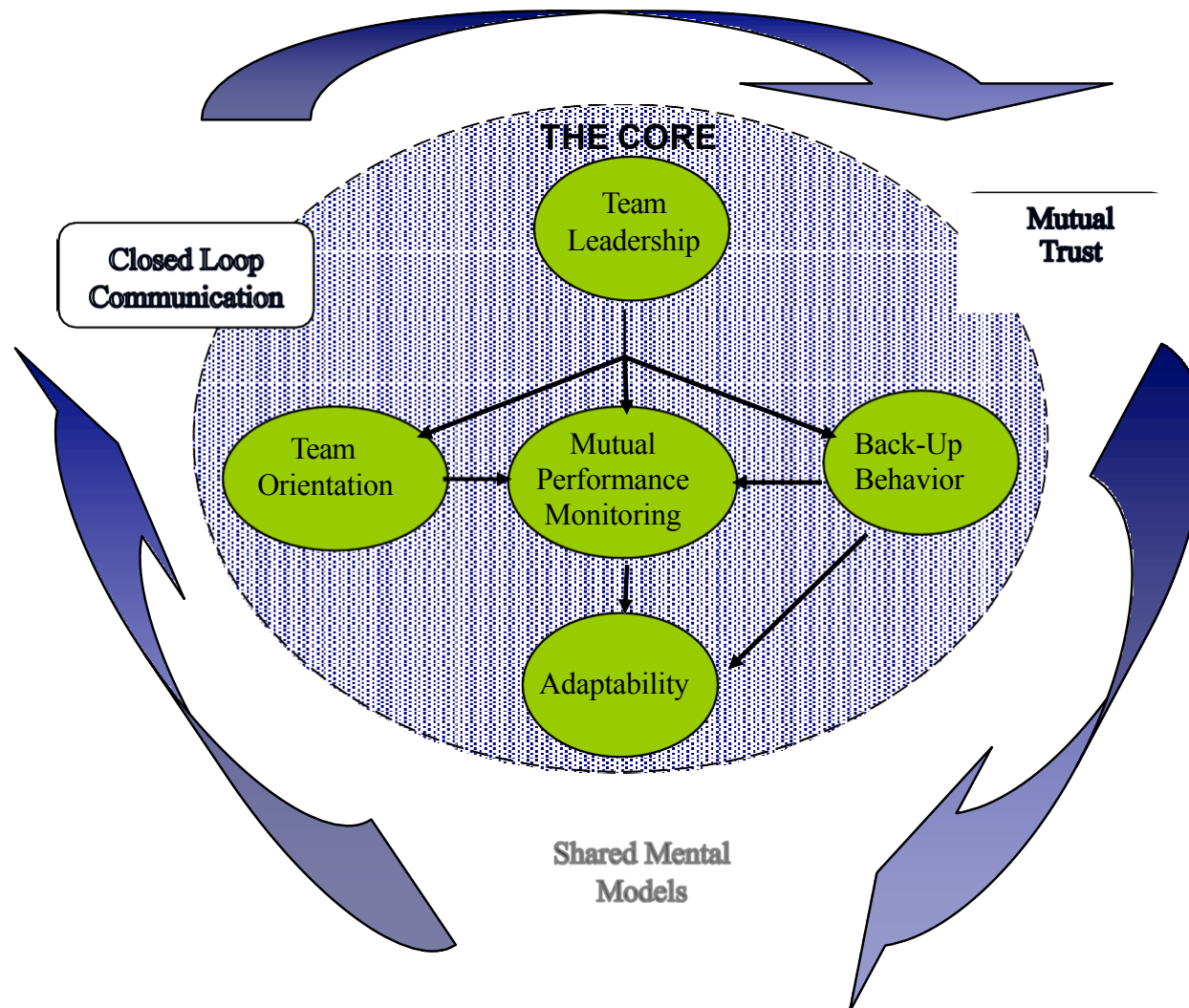
Baker, Salas, King, Battles, Barach, 2006; 2007; Barach and Cosman, 2015; Cosman and Barach 2017

The TeamSTEPPS Framework

- **Knowledge**
  - Shared Mental Model

- **Attitudes**
  - Mutual Trust
  - Team Orientation

- **Performance**
  - Adaptability
  - Accuracy
  - Productivity
  - Efficiency
  - Safety
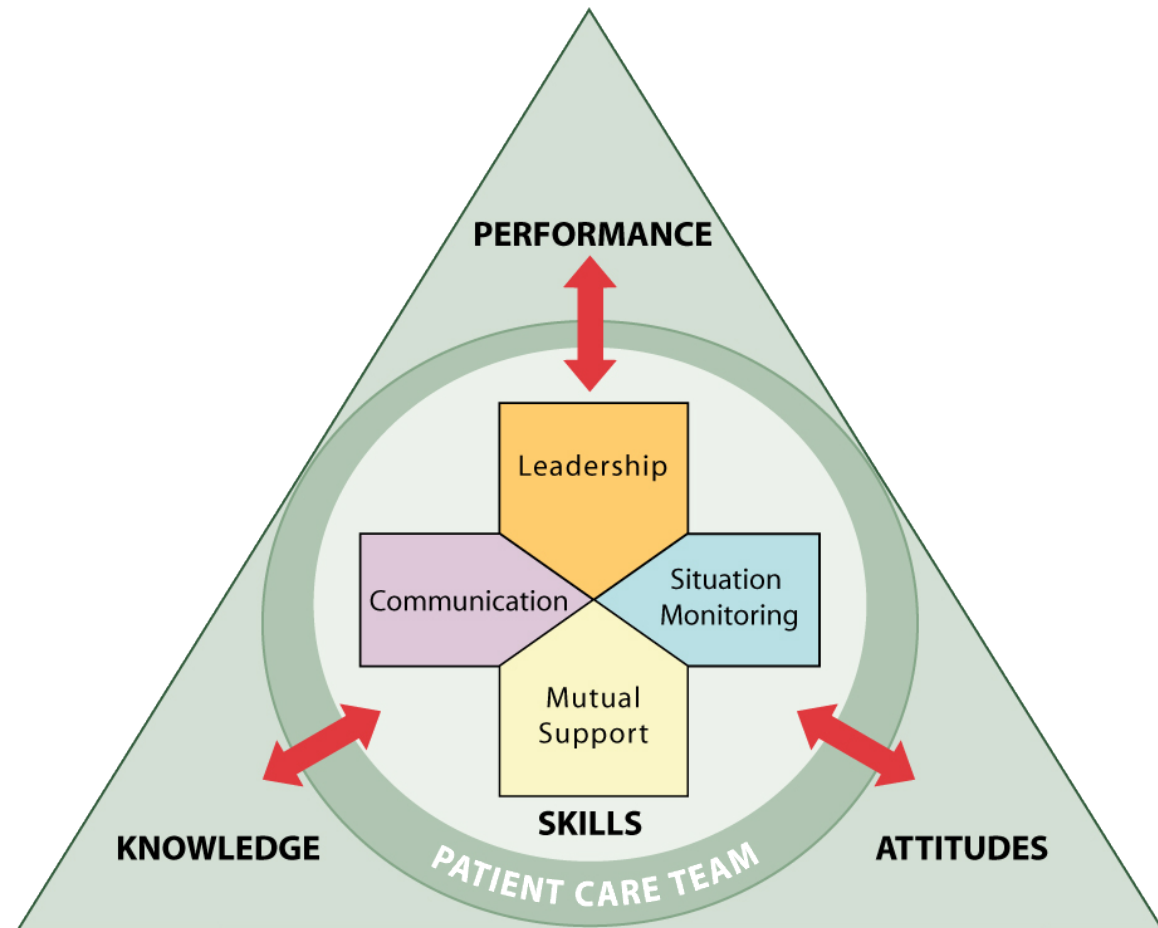
Baker D, Salas E, Battles J, King H, Barach P, 2005, 2007

5) Look to expertise not rank to inform decisions

- Pushing decision making down and around to the person with the most directly related knowledge and expertise
- Let decisions "migrate" to those with expertise to make them.
- Avoid rigid hierarchies.
- Simplify
- Build trust and psychological safety above all.

The Five Dysfunctions of (healthcare) Teams

Results

Accountability

Commitment

Fear of Conflict

Absence of trust

After Patrick Lencioni, 2007

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Shaping the environment for engagement and loyalty

Accountability

Safety

Employees really enjoy working with one another but don't feel particularly challenged.

Here the focus is on collaboration and learning in the service of high-performance outcomes.

Employees tend to be apathetic and spend their time jockeying for position.

People fear to offer tentative ideas, try new things, or ask colleagues for help.
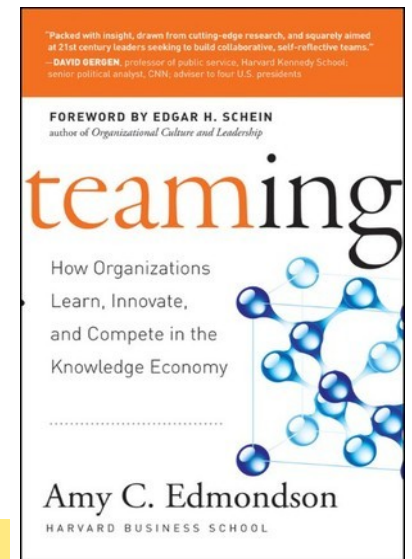
The Proof - High Performing and Satisfied Team = Patient Loyalty

Patient Loyalty Correlation with Staff Engagement

Net Promoter Score Region = - 1.223 + 0.4572 Associate Satisfaction Engage

P value = 0.014
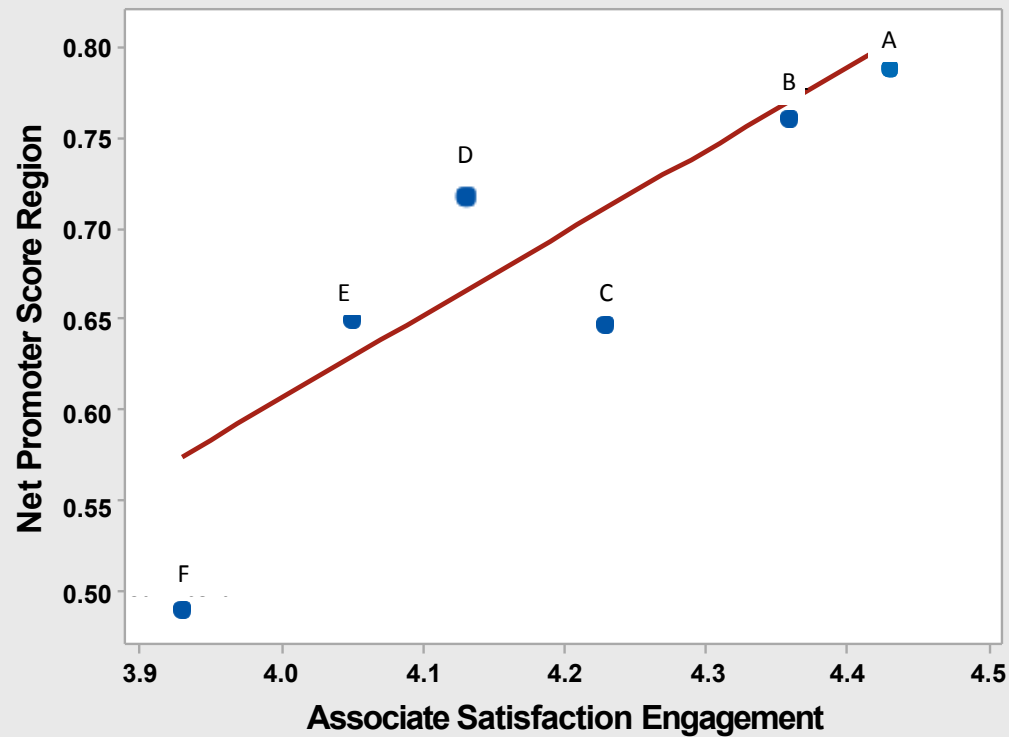
Staff Satisfaction Explains Financial Impact

Fitted Line Plot

EBIDA w CPG Allocation = - 1.200 + 0.3021 Associate Satisfaction Engage

S	0.0180249
R-Sq	89.1%
R-Sq(adj)	86.4%

X-axis: Associate Satisfaction Engage (4.0, 4.1, 4.2, 4.3, 4.4)

Y-axis: EBIDA (2.00%, 4.00%, 6.00%, 8.00%, 10.00%, 12.00%, 14.00%)
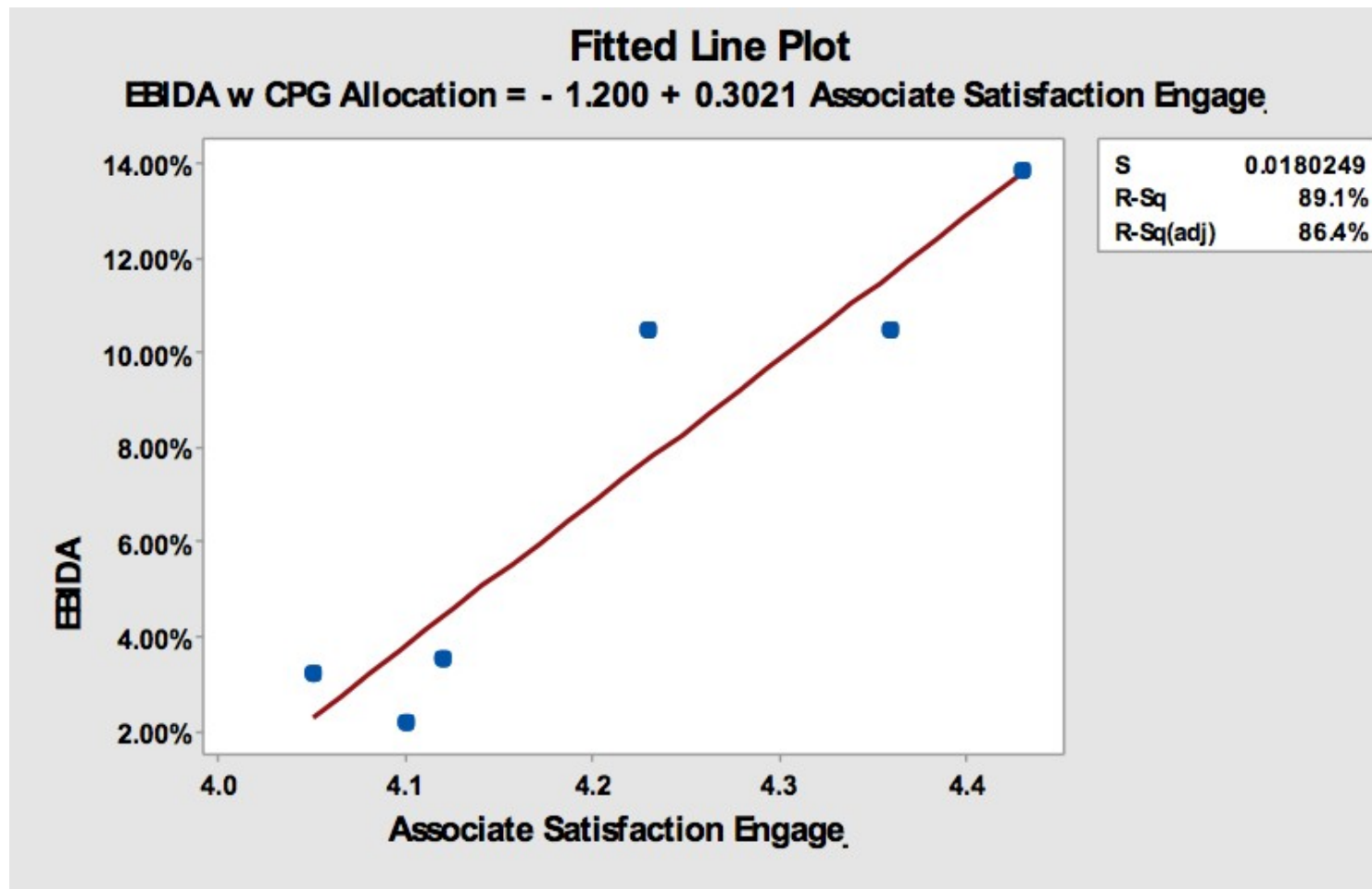
STS-107 Columbia Space Shuttle-2003

The Washington Post

Report Blames Flawed NASA Culture for Tragedy

Miscommunication, Bungling Halted Bids for Shuttle Photos

By ROB STEIN
Washington Post Staff Writer

NASA never obtained pictures of the space shuttle Columbia in orbit that may have helped prevent the disaster because of a series of misunderstandings, miscommunications and bureaucratic bunglings that exemplify the space agency's problems, investigators concluded yesterday.

Lower-level engineers and officials requested at least three times that the Defense Department use its network of high-powered telescopes and satellites to take pictures of the shuttle's damaged left wing, but the requests were either never acted upon or blocked because of inadequate, imprecise or conflicting follow-ups by the space agency, investigators found.

The requests are among eight "missed opportunities" to obtain images of Columbia in space that might have prevented the shuttle's Feb. 1 destruction, which occurred because a piece of foam insulation hit and damaged a wing during liftoff. The report makes it clear that investigators believe such images could have helped save Columbia and its crew of seven—perhaps by prompting a rescue or repair attempt—and the failure to obtain them underscores leadership failures at the space agency.

While investigators had previously revealed that NASA officials had discussed and even requested that the Pentagon take pictures of the shuttle in space, yesterday's 248-page report by the Columbia Accident Investigation Board for the first time details how those requests arose, were executed and, in the end, were quashed.

See REPORT, A15, Col. 1
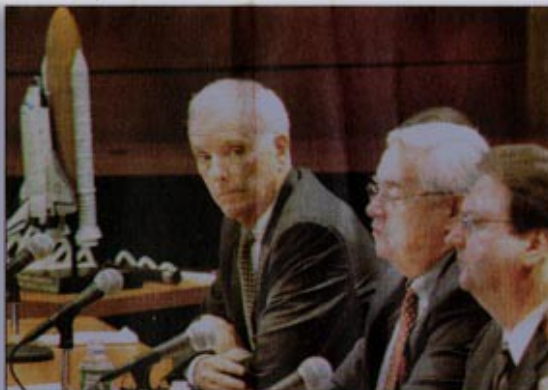
Columbia Accident Investigation Board Chairman Harold W. Gehman Jr. and members John Logsdon and Scott Hubbard discuss their findings.

NASA's Deeper Woes

Behind the technical failings, NASA suffered from a declines in public support and its own scientific edge. *Page A14*

Profit Motive

Investigators found a "potential for conflicts" in the contracting out by NASA of shuttle maintenance and launches. *Page A13*

In Broad Indictment of Practices, Shuttle Panel Says Safety Suffered

By KATHY SAWYER
and ERIC PIANIN
Washington Post Staff Writers

The shuttle Columbia and a crew of seven were lost on Feb. 1 because NASA, for the second time in its recent history, allowed its engineering to grow careless, its safety system to wither, its communications to become muddled and prudent professional curiosity to become stunted.

Those conclusions were part of a far-reaching indictment issued yesterday by the Columbia Accident Investigation Board, in a comprehensive and unsparing assessment of the human spaceflight program. Laying at least part of the blame for NASA's failings on persistent budget and other pressures flowing from Congress and the White House over several administrations, the plainspoken 248-page report is designed to provide the foundation for an unprecedented national debate on the future of human spaceflight, which the board said is long overdue.

A 1.7-pound chunk of foam insulation that struck Columbia's left wing at more than 500 mph during the Jan. 16 ascent was "the direct, physical action that initiated the chain of events leading to the loss of Columbia and her crew," the board wrote.

But, in chilling echoes of the environment that produced the 1986 Challenger tragedy, the board found that NASA's management and cultural mind-set were as culpable because they paved the way for the foam strike to do its deadly work. Before the mission, managers did not heed foreshadowings of the potential threat; and during the

See FAILURE, A16, Col. 2

Region

Bush: U.S.

Safety Engineering - Leadership's Role

"I was absolutely amazed that the NASA people I argued with against the launch…

didn't even mention to other members of the mission management team that there was a concern…"

Columbia Accident Investigation Board

"Cultural norms tend to be fairly resilient…the norms bounce back into shape after being stretched or bent. Beliefs held in common resist alteration….This culture acted over time to resist externally imposed changes.

By the eve of the Columbia accident, institutional practices that were in effect at the time of the Challenger accident had returned to NASA."

Normalisation of Deviance

- "Once you have accepted an anomaly or something less than perfect, you have given up your virginity. You can't go back. You're at the point when it's very hard to draw the line. Next time they say it's the same problem, it's just eroded 5 mm more. Once you accepted it, where do you draw the line? Once you have done it, it's very difficult to go back now and get very hard nosed and say I'm not going to accept that"
- "A permissive ethical climate, an emphasis on financial goals at all costs, and an opportunity to act amorally or immorally, all contribute to managerial decisions to initiate deviance."

Diane Vaughan. The Challenger Launch Decision. University of Chicago Press. 1996

The Normalization of Deviance: Do We (Un)Knowingly Accept Doing the Wrong Thing?

- Failure to wash the hands before and after patient contact.
- Less than 10% of adverse medication events reported
- Failure to follow recognized isolation procedures and protocols.
- Leaving junior doctors alone at night and weekend without supervision.
- Disconnect alarms during patient movement.
- Failure to call RRT when criteria are met
- Wearing hospitals scrubs home.
- Not telling the patient and/or family the full story about how harm was caused

Stages in the development of a safety culture

GENERATIVE (High Reliability Orgs)
HSE is how we do business round here

PROACTIVE
Safety leadership and values drive continuous improvement

CALCULATIVE
We have systems in place to manage all hazards

REACTIVE
Safety is important, we do a lot every time we have an accident

PATHOLOGICAL
Who cares as long as we're not caught

Increasingly Informed

Increasing Trust and Accountability

After Westrum

Keys Steps on the Climb to High Reliability(I)

- Board establishes patient safety as the system's core value and zero harm as a primary system goal

- Senior leaders embrace and actively promote a just and safe organizational climate and culture

- Mid-level and frontline leaders are formally trained to be high reliability experts

- Front line staff and patients/families feel safe to speak up, including near miss notification

Predictive Analytics Prevents Readmissions (from Richard Morrow)

	TOTAL KNEE/HIP Risk and Care Plan System Care Plan Tailored for Each Patient			Not High Risk		Probability of Readmission prior to care plan		2%
A.	**Risk Factor**	ENTER a 1 if Yes	Suggested Treatment Plan			PCP Appt. advised?	F/U Call advised?	Odds Ratio
	Hemodialysis	0	Medical Readmit....					>3 : 1
Admission Nurse Screen								
	Patient is High Risk if on dialysis. **STOP.** If not on dialysis, continue to part B.							
B.	**Risk Factor**							
	SNF	0	Intervention by team					1.8 : 1
	Rehab	0	Intervention by team					2.3 : 1
Admission Nurse Screen								
	Patient is High Risk if not discharging home. **STOP.** If discharging home, continue to part C.							
C.	**Risk Factor**							
	Gender Male	0	Knee Complication Prevention Teaching					1.5 : 1
	Age >75	0	Medical / General Readmit....					1.5 : 1
	Age 50-64	0	Infection Prevention teaching.					
	Anemia	0	Infection/Disproved, GI, GIB, Sepsis.					2.8 : 1
	Gender Female	0	Fracture, Dehiscence, Cardiac.					
	Current/Former Smoker	0	Focus on dehiscence prevention, Nutrition in D/C Instruction process. Nutrition consult?					1.2 : 1
	BMI > 34	0	Infection Prevention teaching. Dehiscence prevention. Hips are higher in this pop.					1.4 : 1
	CHF	0	Discuss weight management, if your weight is up 3-5 lbs overnight or 10 lbs in one week call PCP. Your weight is imp					2.6 : 1
Admission Nurse Screen								
	High Risk based on conditions above?							
D.	**Risk Factor**							
	Blood Transfusion	0	Medical Readmit....					2.6 : 1
	LOS > 3 days	0	Medical Readmit....					1.7 : 1
Discharge Nurse Screen								
	If the patient total score is greater than 20, score YES - High Risk							

John Kotter, *Leading Change*:
Why transformation efforts fail

- Lack of **urgency** (complacency)
- Fail to create a powerful **coalition**
- Failure to create a compelling **vision**
  - Competing visions (money vs safety; frontline vs leadership)
- Failure to **communicate** the vision clearly
- Failure to **remove obstacles**
- Failure to achieve **early wins**
- Declaring **victory** too soon
- Failure to **anchor change** in the culture

Keys Steps on the Climb to
High Reliability (II)

- An objective system for reporting and evaluating near miss and harm events is in place and actively utilized at all levels of the organization

- Common platform for robust process improvement is instituted and fully supported (training and funding)

- Patients and families are actively engaged at the strategic, operational and clinical levels

- Highly reliable performance is recognized, celebrated and rewarded throughout the organization

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Training Program-Everything Needed to High Reliability

	1	2	3	4	5	6	7	8	9	10	11	12
Culture	Leadership Critical Success Factors for High Reliability		Building a Safety Culture									
			High Reliability Mindfullness Development									
People			Problem Solving Skills		Communication and Teamwork Training			Management and Leadership Systems: "Just" Culture and Process Support				
Process (Improvement)			Reliability Principles for Healthcare									
Clinical Technology			Technology that supports value creation				Workflow that utilizes technology effectively					
			Rapid Improvement/Rapid Design of Systems and Services									

Conditions for the realization of an HRO organization in healthcare (III)

In my experience I have found that the <u>most important </u>elements are:

1. Having an informed and safe culture. How do you ensure that managers and employees (<u>of their own accord</u>) keep each other informed of issues relevant to the performance of the organization?

2. Having common references. How can you encourage everyone to keep talking <u>truthfully</u> to each other about the question 'What do we want to achieve together?'even beyond the boundaries of the organization.

3. Ensuring redundancy. How can those involved constantly be aware through radical <u>transparency</u> that many roads lead to Rome and the way they can make use of this?

4. Trusting Relationships are central. How do we ensure that <u>trusting relationships</u> between employees and departments / parties are a common focus and that anonymity and detachment are seen as a potential threat?

Leverage and Integrate Technology to help Identify and Manage Risk

- Identify provider and patient risks through analytics

- Reduce clinical variance

- Reactive documentation and analysis of past events, plus proactive vizualization of every patient's risk profile

- Financial component shows the cost of relative harm
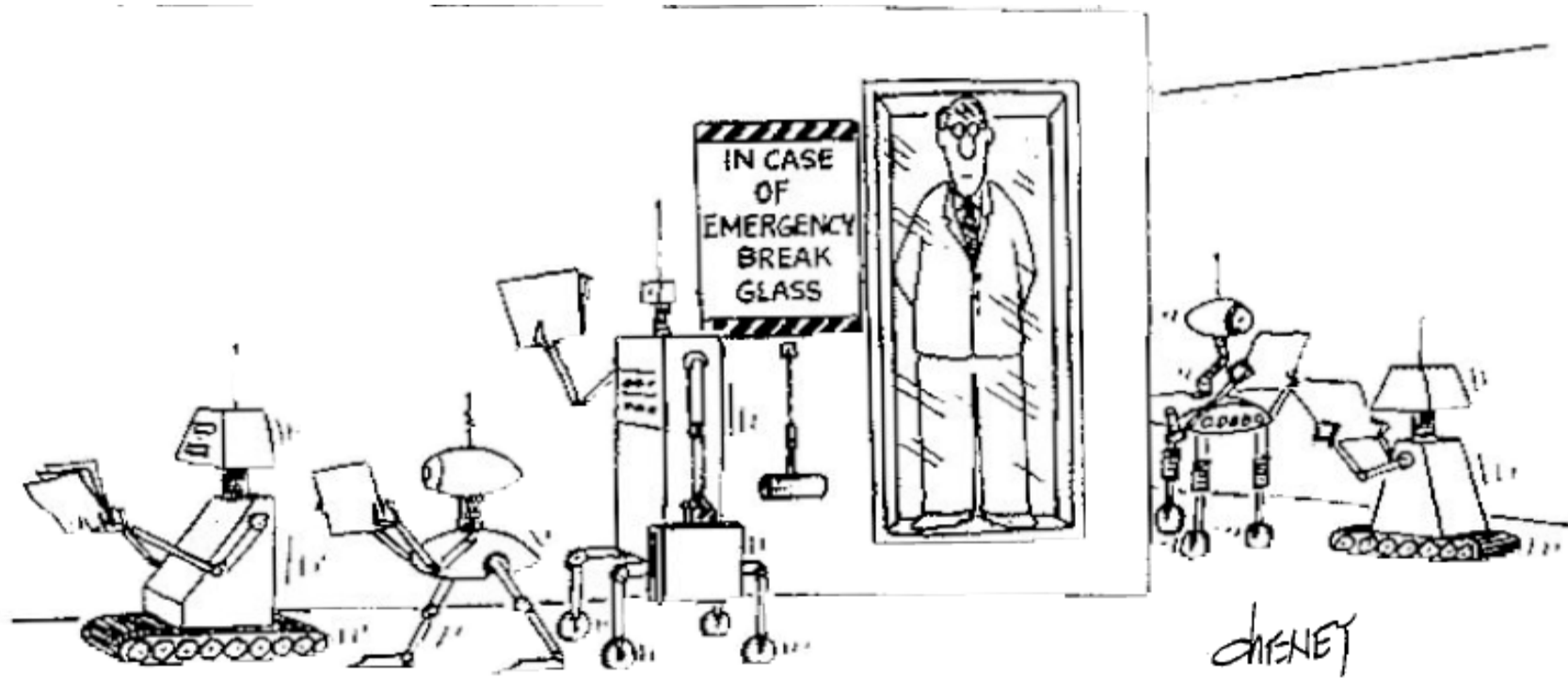
FIGURE 3.5

Ultimate functional allocation when using a "capability" criterion. (*Source:* Cheney, 1989. New Yorker Magazine, Inc.)

What can Healthcare Leaders do?

- Overcome factors that prevent us from learning
  - interpersonal fear
  - irrational beliefs about failure
  - groupthink
  - problematic power dynamics
  - information hoarding
  - Normalised deviance
- Health leaders can shape these factors by
  - Building trust
  - Create psychological safety
  - Encouraging reflection and time to learn
  - Overcoming defensive interpersonal dynamics
  - Fund, support and champion small, rapid cycle improvement pilots
  - Hyper-transparency of plan, design, processes

Journey to Reliability – The Next Zero

Reliability (y-axis): 10^{-8}, 10^{-7}, 10^{-6}, 10^{-5}, 10^{-4}, 10^{-3}, 10^{-2}, 10^{-1}

Optimized Outcomes

Human Factors Integration
- Intuitive design
- Obvious to do the right thing
- Impossible to do the wrong thing

Reliability Culture
- Core values & vertical integration
- Behavior expectations for all
- Hire for fit
- Fair, just, and 200% accountability

Process Design
- Evidence-based best practice
- Focus & Simplify
- Tactical improvements (e.g. process bundles)

"No matter how well equipment is designed, no matter how sensible regulations are, no matter how much humans can excel in their performance, they can never be better than the system that bounds them."

Captain Daniel Maurino, Human Factors Coordinator
International Civil Aviation Organization

CASE STUDIES in PATIENT SAFETY

Foundations for Core Competencies

Julie Johnson · Helen Haskell · Paul Barach

Paul R. Barach
Jeffery P. Jacobs
Steven E. Lipshultz
Peter C. Laussen *Editors*

Pediatric and Congenital Cardiac Care

Volume 1:
Outcomes Analysis

Springer

Paul R. Barach
Jeffery P. Jacobs
Steven E. Lipshultz
Peter C. Laussen *Editors*

Pediatric and Congenital Cardiac Care

Volume 2:
Quality Improvement and Patient Safety

Springer

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pbarach@gmail.com

David Sykes · Paul Barach · Kurt Rockstroh *Editors*

Quiet: A Healthcare Acoustics Teaching Improvement Guide

Thirty years of public neglect of noise and privacy issues in America have resulted in general ignorance about how noise and privacy affect our health, performance, and even our ability to compete in the global economy. The authors of "Quiet!" have spent a decade working together and leading a broad, international initiative to develop, test and implement comprehensive noise and privacy policies in the most demanding environment imaginable: healthcare facilities. Their work (published by ANSI S12 WG44 as "Sound & Vibration…2.0") has already been adopted into building codes across the USA and has been also adopted by the U.S. Green Building Council as the criteria for new "Environmental Quality" credits in the LEED for Health Care initiative. "Quiet!" provides an inside perspective and an indisputably authoritative and practical guide to how to address noise and privacy problems in all types of health care facilities. Healthcare executives, planners, architects, lawyers, engineers, designers, real estate professionals, and patients rights advocates will find "Quiet!" an invaluable source of practical guidance in meeting the new code requirements, in securing LEED credits, and in turning healthcare environments into quiet, private, peaceful places where patients, doctors and families can find respite.

Sykes · Barach · Rockstroh *Eds.*

David Sykes
Paul Barach
Kurt Rockstroh
Editors

Quiet:
A Healthcare Acoustics Teaching Improvement Guide

Quiet: A Healthcare Acoustics Teaching Improvement Guide

Environment

ISBN 000-0-0000-0000-0

▶ springer.com

Available December 2018

Springer

This book focuses exclusively on the surgical patient and on the perioperative environment with its unique socio-technical and cultural issues. It covers preoperative, intra-operative, and postoperative processes and decision making and explores both sharp-end and latent factors contributing to harm and poor quality outcomes. It is intended to be a resource for all healthcare practitioners that interact with the surgical patient. The first section presents foundational principles of safety science and related social science. The second exposes barriers to achieving optimal surgical outcomes and details the various errors and events that occur in the perioperative environment. The third section contains prescriptive and proactive tools and ways to eliminate errors and harm. The final section focuses on developing continuous quality improvement programs with an emphasis on safety and reliability.

Surgical Patient Care: Improving Safety, Quality and Value targets an international audience which includes all hospital, ambulatory and clinic-based operating room personnel as well as healthcare administrators and managers, directors of risk management and patient safety, health services researchers, and individuals in higher education in the health professions.

Sanchez
Johnson
Jacobs
Editors

Surgical Patient Care
Improving Safety,
Quality and Value

Sanchez · Johnson · Barach · Jacobs *Eds.*

Surgery

ISBN 978-3-319-44036-8

▶ springer.com

Surgical Patient Care

Improving Safety, Quality and Value

Juan A. Sanchez
Paul Barach
Julie Johnson
Jeffrey P. Jacobs
Editors

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