CARDIOLOGY 2025

28th Annual Update on Pediatric and Congenital Cardiovascular Disease

Hope. Heal. Learn.

It Doesn't Always Turn Out the Way We Want:
Disappointments and Errors in Pediatric & Congenital Cardiovascular Disease

Communicating Errors and How to Learn from Mistakes

Daniel Penny,
Executive Co-Director, Heart Center, Texas Children's Hospital.
Abercrombie Professor of Pediatrics, Baylor College of Medicine,
Houston, TX

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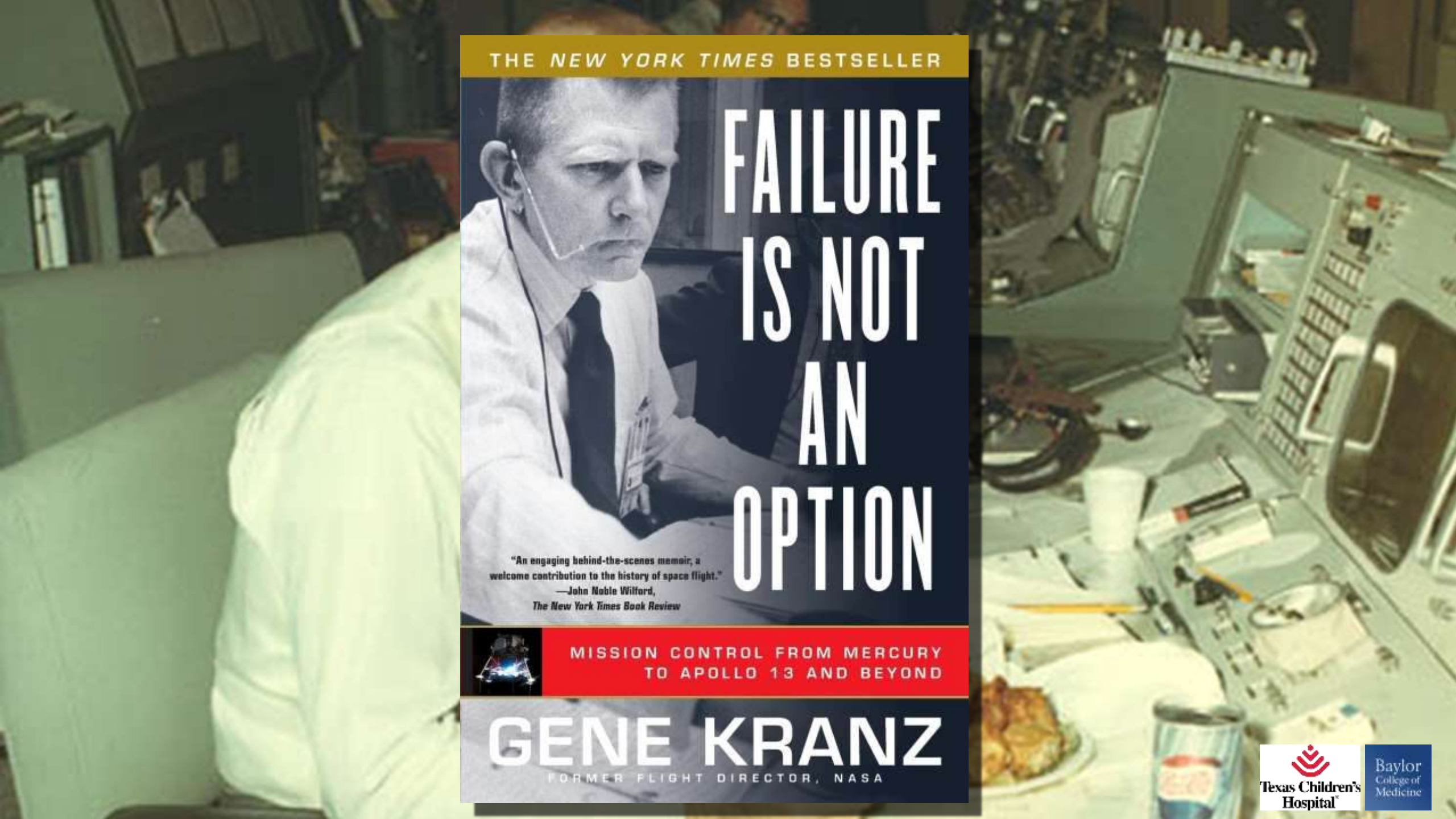
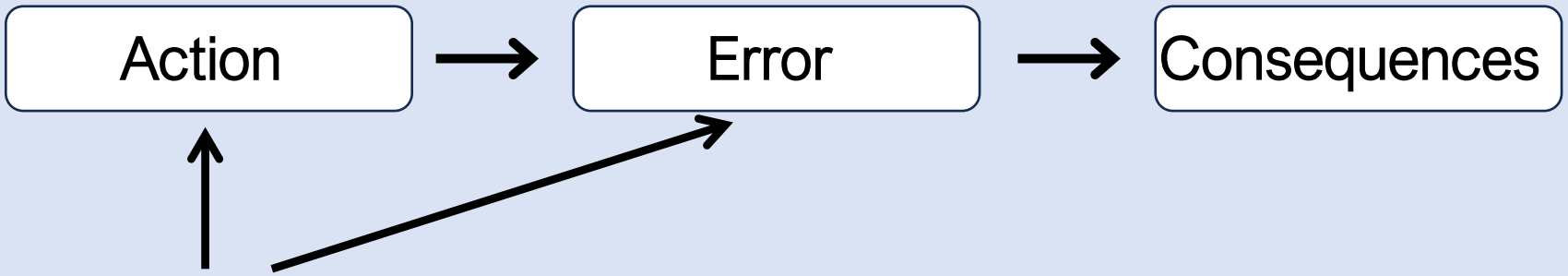

THE NEW YORK TIMES BESTSELLER
FAILURE IS NOT AN OPTION
"An engaging behind-the-scenes memoir, a welcome contribution to the history of space flight."
—John Noble Wilford,
The New York Times Book Review
MISSION CONTROL FROM MERCURY TO APOLLO 13 AND BEYOND
GENE KRANZ
FORMER FLIGHT DIRECTOR, NASA

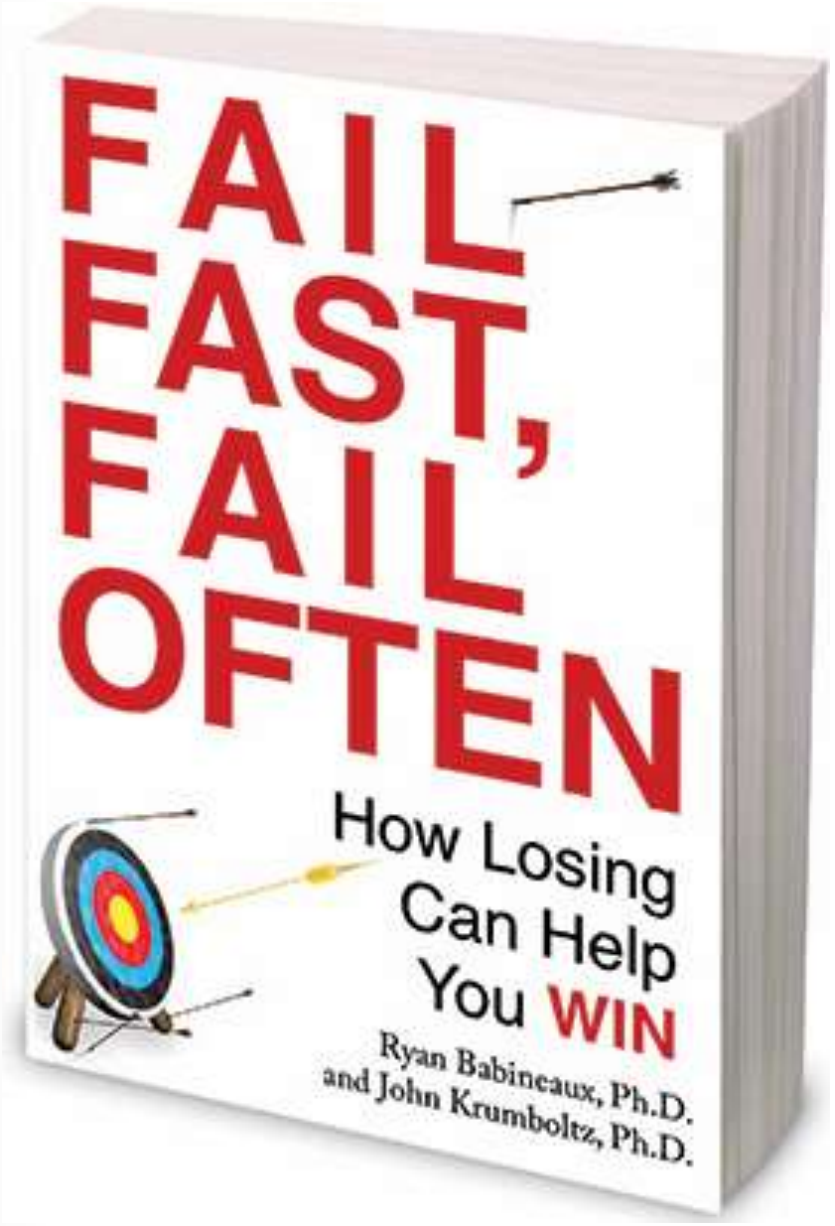
Action-error cycle



Modified from Frese M et al. Annu Rev Psychol 2015


Failure is an option here. If things are not failing, you are not innovating enough.
Elon Musk


Move fast and break things.
Unless you are breaking stuff, you are not moving fast enough.
Mark Zuckerberg



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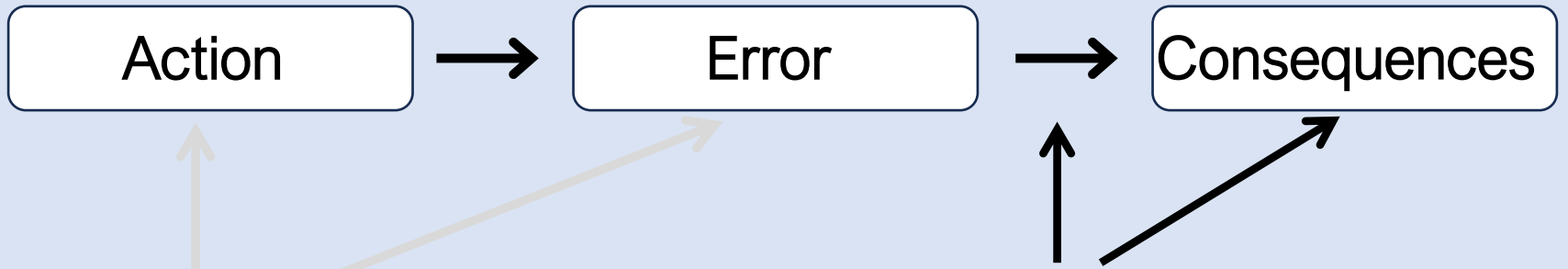
Action-error cycle



Error Prevention

- Belief: 'Errors are highly negative'
- Mind-set: 'Errors can and need to be prevented' (zero error tolerance)

Error Management

- Belief: 'Errors are inevitable and while negative can be turned into something positive'
- Mind-set: 'Errors Happen" (acceptance of human error)

Modified from Frese M et al. Annu Rev Psychol 2015

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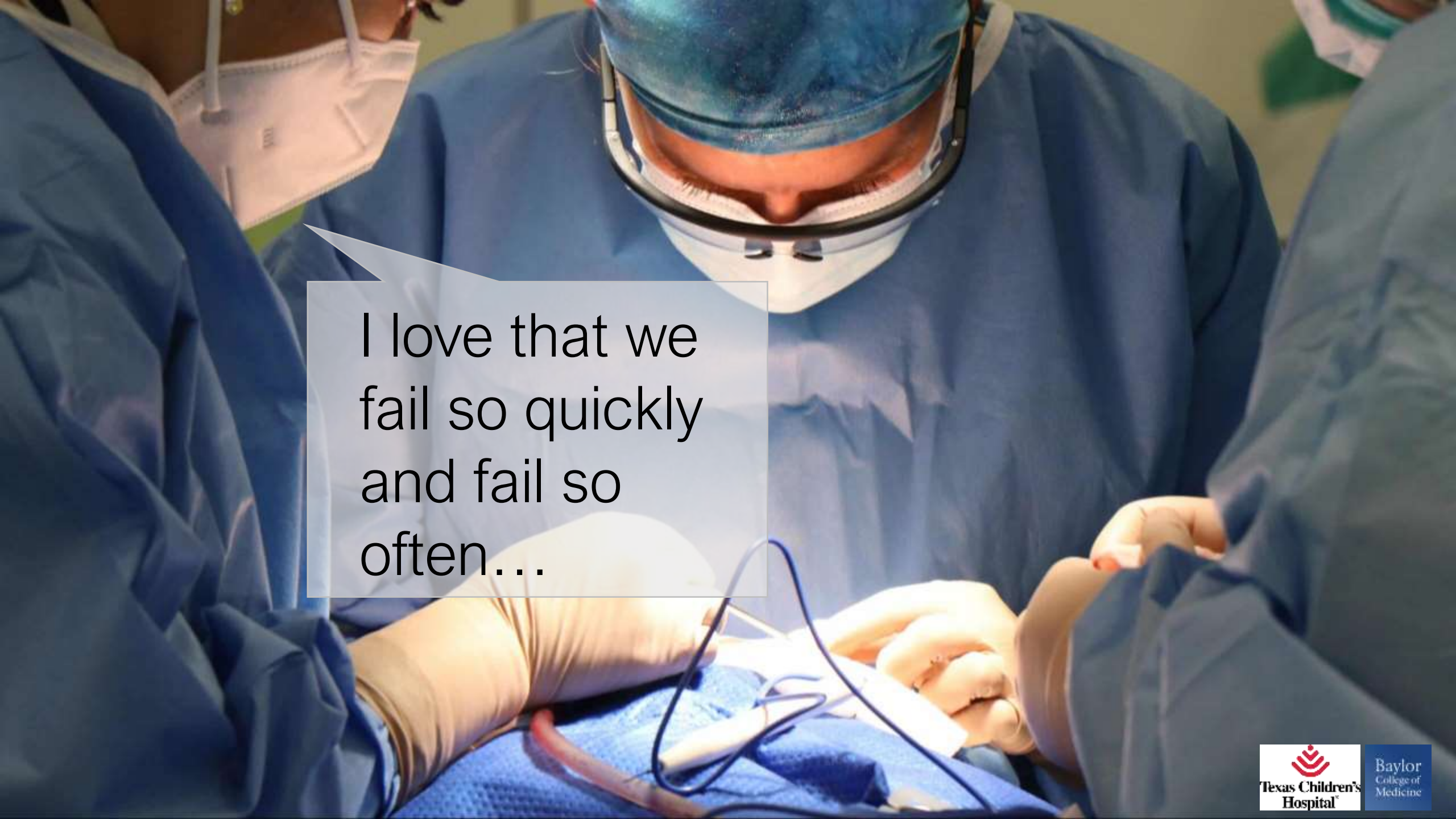
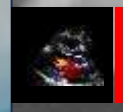
OK Team.
Today Let's Aim To Fail
Early and Fail Often!
Check.
Fail Early and Fail Often!


I love that we fail so quickly and fail so often…

THE New York Times BESTSELLER

FAILURE IS INEVITABLE



Failure at The Cutting Edge of Modern Medicine

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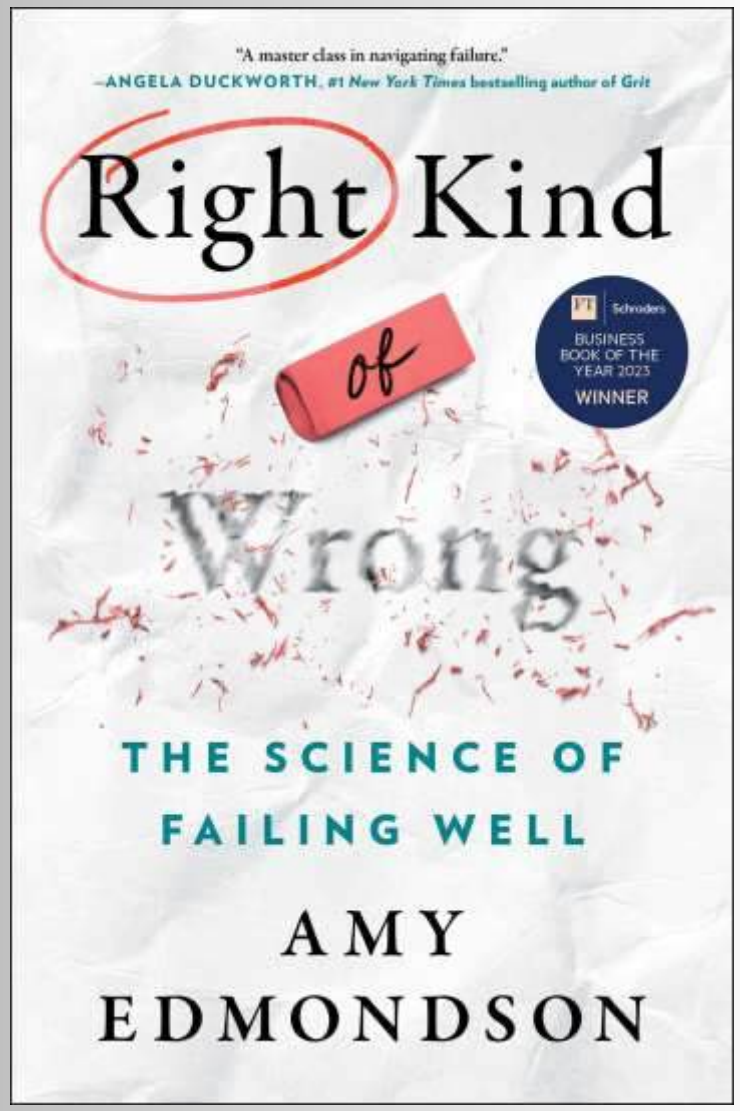

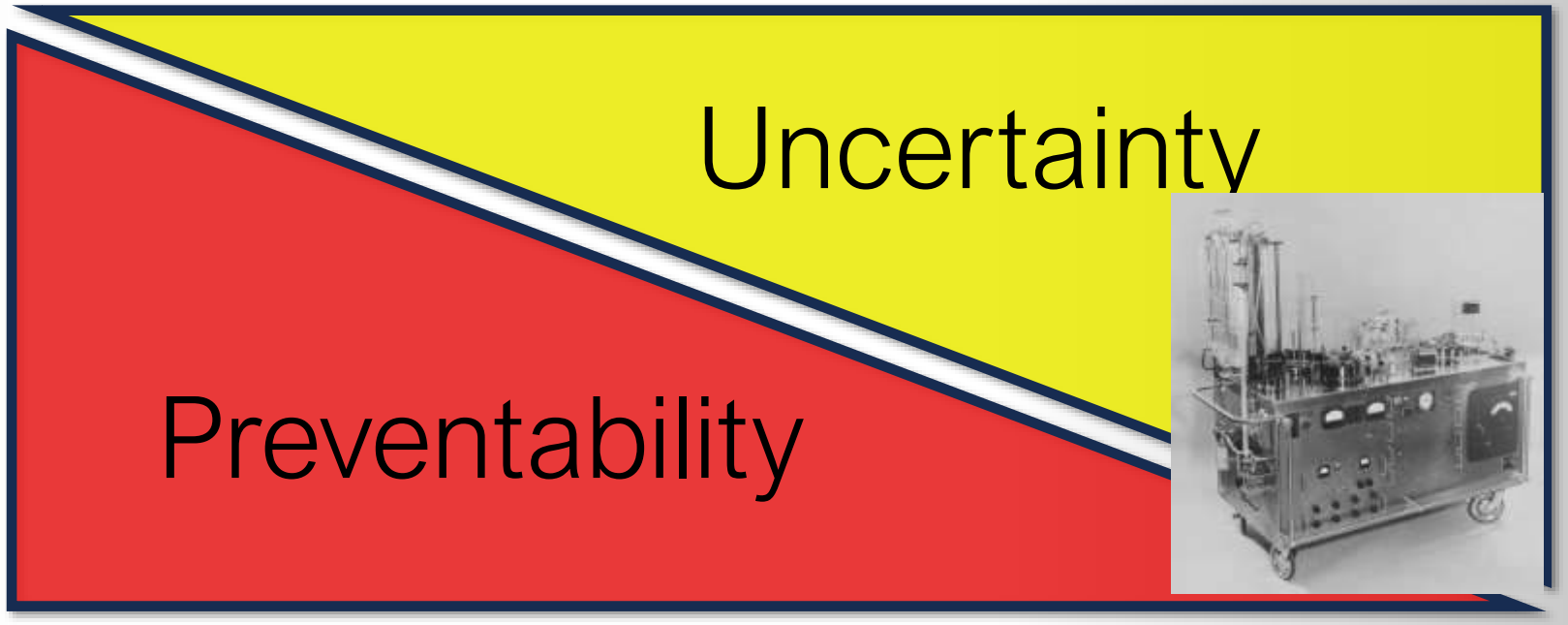

Basic Failure

Complex Failure

Intelligent Failure

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A Question For You If I May

How Often Do Failures in Your Program…

Get Treated As If They Result
From Blameworthy Acts?

Result From Blameworthy Acts?

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Always Searching To Blame

Is Illogical

People are not trying hard enough.

People are not motivated to avoid mistakes.

Always Searching To Blame

Is Counterproductive

This stance doesn't make people perfect.

You just increase the chances that you won't hear about the problems when they occur.

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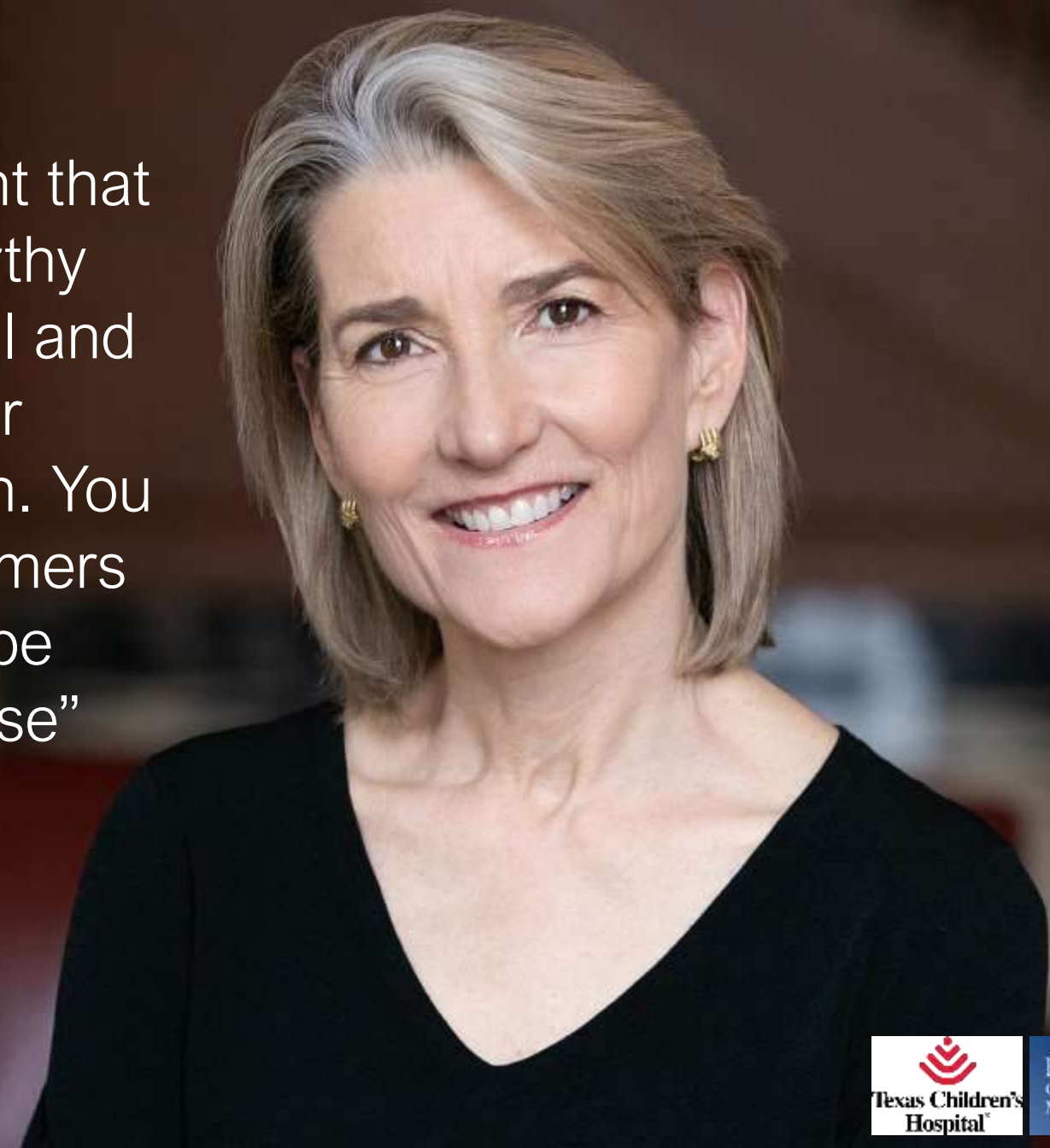
”You have a thoughtful experiment that ends in failure. That’s a praiseworthy action as long as it was thoughtful and not foolhardy. And so you did your homework. You thought it through. You thought this might help our customers and you were wrong. We should be giving you a nice round of applause”



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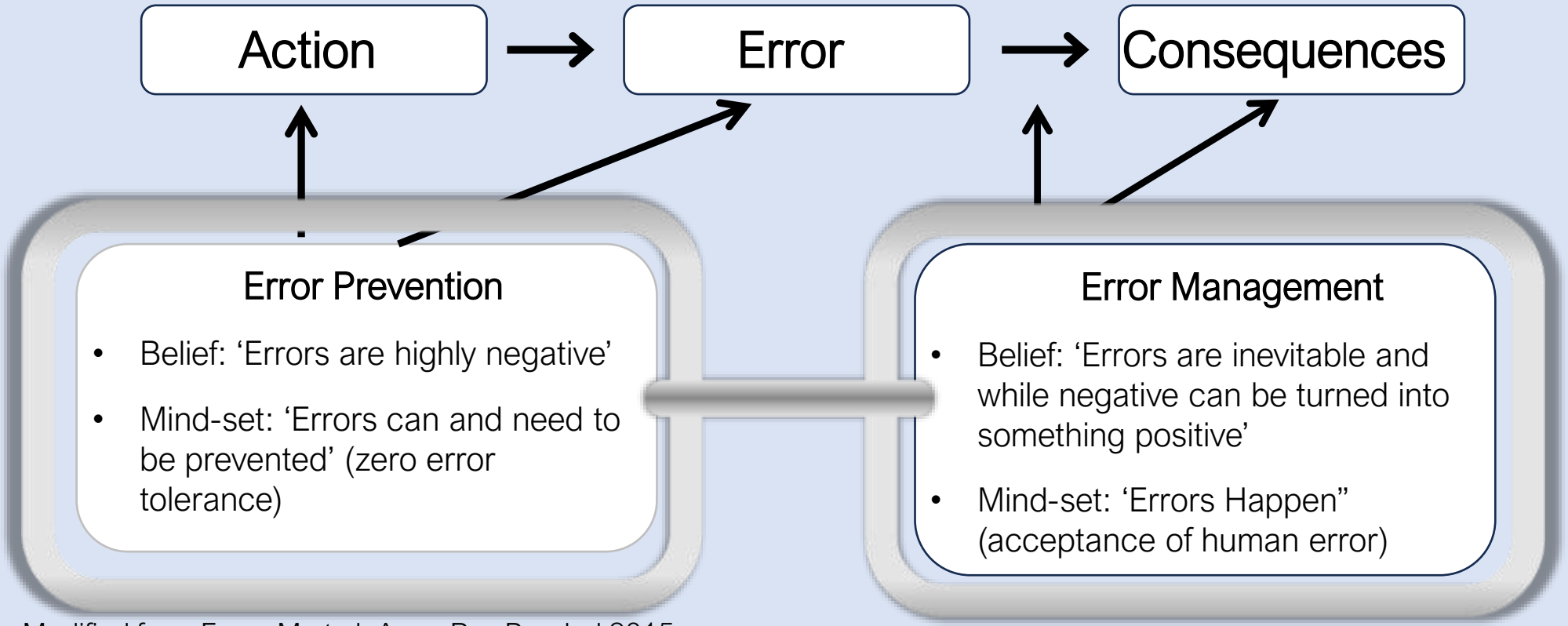
Action-error cycle



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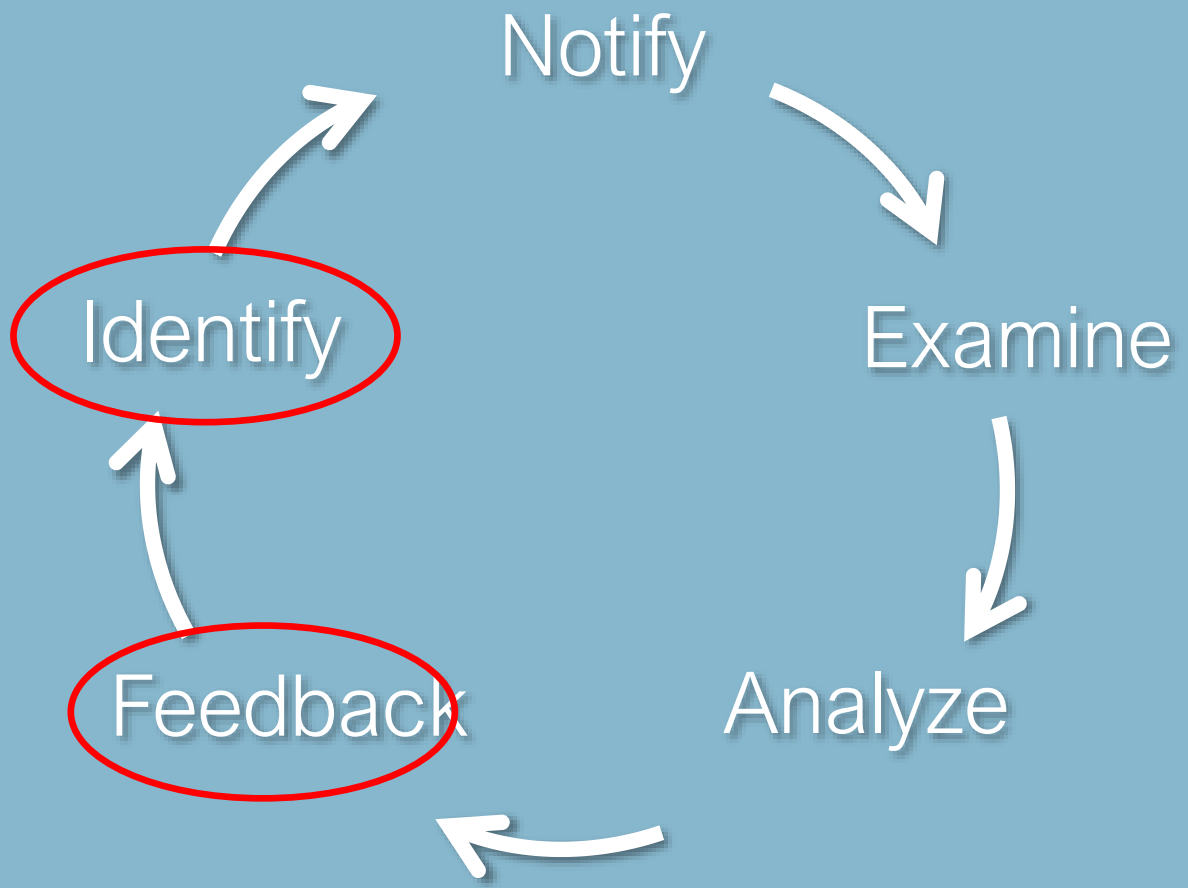
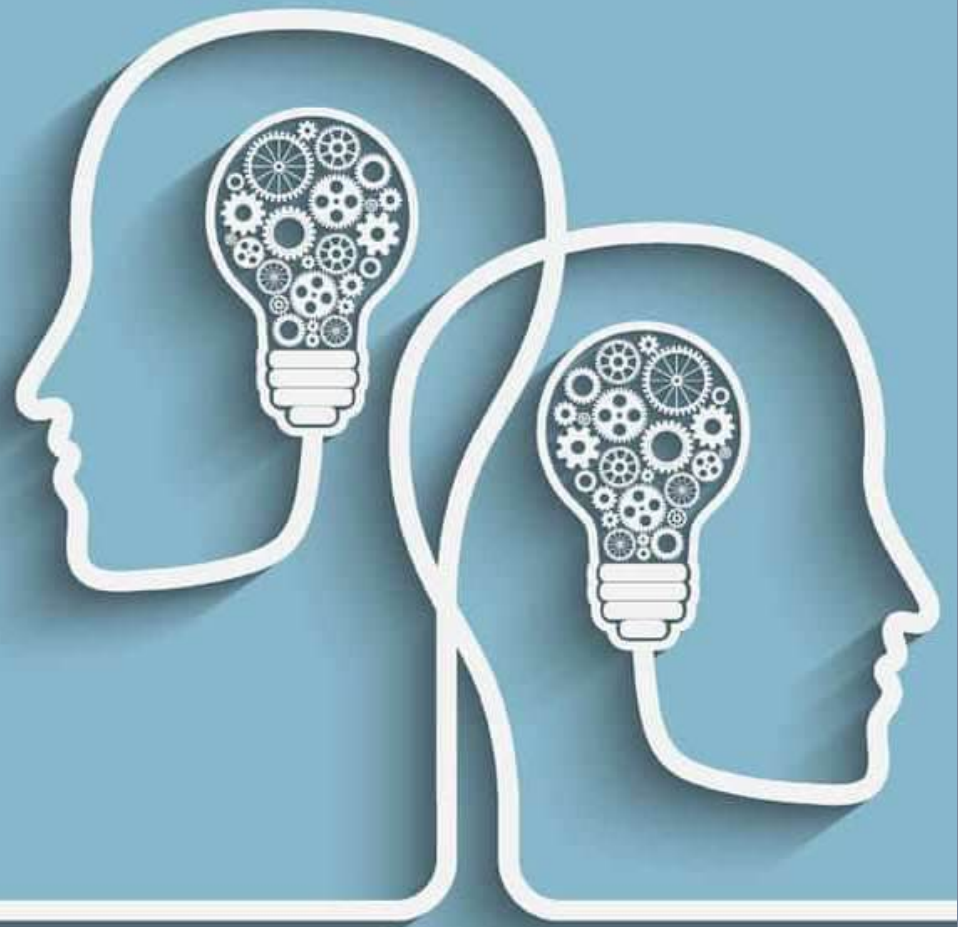
Learning Cycle - Process





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Process – Near Miss

Analysis of a cluster of surgical failures

Application to a series of neonatal arterial switch operations

A pediatric cardiac surgeon performed 104 neonatal arterial switch operations for transposition of the great arteries with or without ventricular septal defect between June 1987 and February 1993. Initial euphoria on having only one death in the first 52 patients gave way to increasing concern when patients 53, 55, 59, 63, 64, 67, and 68 died. Sensing a problem, the surgeon visited a low-risk institution after patients 55 and 64 had died and then decided to retrain after patient 68 died. One death has occurred since. To find out whether the cluster of failures could have been related to chance alone, to variability of risk factors across time, or to suboptimal performance, we conducted the following analyses: First, identification of trends with the cumulative sum procedure was undertaken and actual mortality compared with the mortality predicted from an equation derived from a multiinstitutional study. Second, logistic regression analysis of risk factors was done. If a mechanism of continuous monitoring had been in place, unfavorable trends and a need for change in protocol would have been detected earlier. Retrospective risk factor analysis suggested an excessive risk for patients with origin of the circumflex or left anterior descending coronary arteries from sinus 2 and a protective effect of phenoxybenzamine. However, about half of the risk associated with the cluster of failures was not accounted for by the variables analyzed. There was therefore an indication of suboptimal performance that appears to have been neutralized by retraining. (J Thorac Cardiovasc Surg 1994;107:914-24)

Marc R. de Leval, MD, FRCS, Katrien François, MD (by invitation), Catherine Bull, MRCP (by invitation), William Brawn, FRCS (by invitation), and David Spiegelhalter, PhD (by invitation), *London, England*

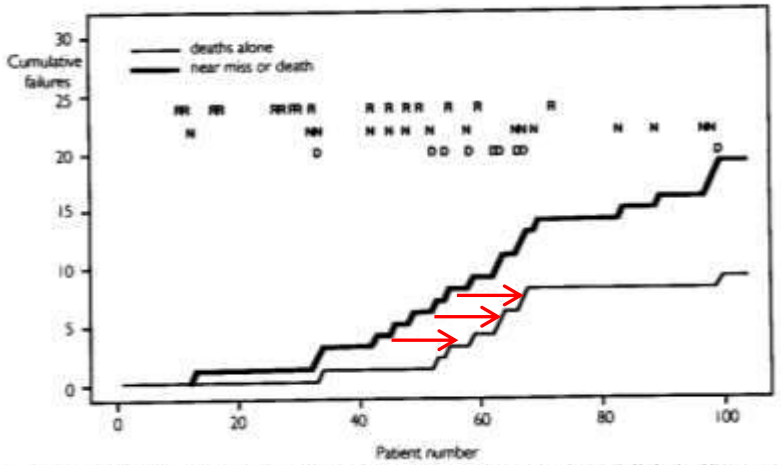

Fig. 2. Cumulative failure. "Failure" as death or death/near miss. *R*, Peritoneal dialysis; *N*, near miss; *D*, death.

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Process

NASA Model of "Threat and Error" in Pediatric Cardiac Surgery: Patterns of Error Chains

Edward Hickey, MD, FRCSC, Eric Pham-Hung, HBSc, Yaroslavna Nosikova, JD, MASc, Fredrik Halvorsen, MD, PhD, Michael Gritti, HBSc, Steven Schwartz, MD, FRCPC, Christopher A. Caldarone, MD, FRCSC, and Glen Van Arsdell, MD, FRCSC

Divisions of Cardiovascular Surgery, Cardiac Critical Care, and Department of Surgery, The Hospital for Sick Children, Toronto, Ontario, Canada

Background. We introduced the National Aeronautics and Space Association threat-and-error model to our surgical unit. All admissions are considered flights, which should pass through stepwise deescalations in risk during surgical recovery. We hypothesized that errors significantly influence risk deescalation and contribute to poor outcomes.

Methods. Patient flights (524) were tracked in real for threats, errors, and unintended states by full- performance personnel. Expected risk deescalation wean from mechanical support, sternal closure, ex tion, intensive care unit (ICU) discharge, and disc home. Data were accrued from clinical charts, be data, reporting mechanisms, and staff interviews. graphics of flights were openly discussed week consensus.

Results. In 12% (64 of 524) of flights, the child fa deescalate sequentially through expected risk unintended increments instead occurred. Failed calations were highly associated with errors (4

flights; $p < 0.0001$). Consequential errors (263; 173 flights) were associated with a 29% rate of failed deescalation versus 4% in flights with no consequential error ($p < 0.0001$). The most dangerous errors were apical errors typically (84%) occurring in the operating room, which caused chains of propagating unintended states (n = 110); these had a 43% (47 of 110) rate of failed

The medical profession has historically had an and opaque approach to errors and bad outco Morbidity and mortality meetings are held behin doors and medical staff often report that errors cult to discuss [2, 3]. The aviation industry has ta more introspective and transparent approach, National Aeronautics and Space Association psychologists recognized in the 1970s that humar least reliable resource in the cockpit [4]. Over t quent decades, commercial airlines and aviatio ities have scrutinized cockpit behaviour through routine use of simulators and Line Safety Audits (LOSAs) [5].

LOSAs are assessments of threats facing cock and subsequent errors made—based on live o during standard flights [6]. They are ubiq

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Address correspondence to Dr Hickey, The Hospital for Sick University Ave, Toronto M5G 1X8, Canada; email:

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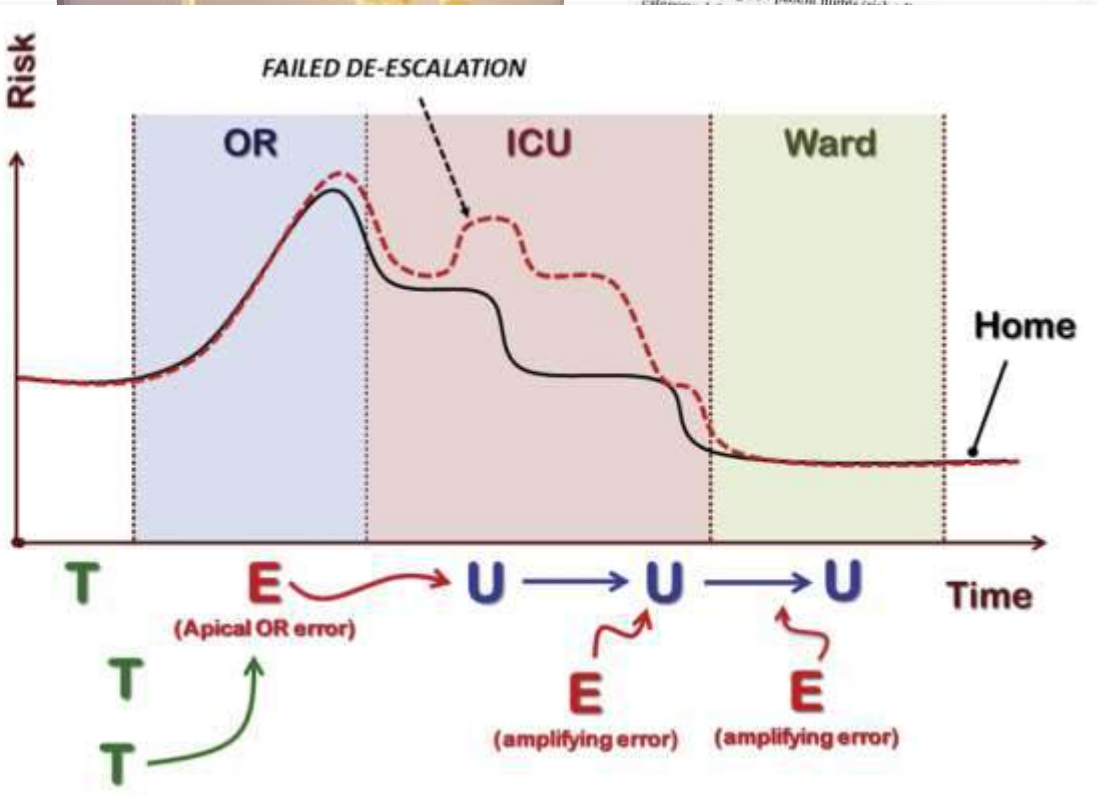
CONGENITAL HEART

Fig 3. Schematic flight plan infographic illustrating the expected deescalation in risk (black line). Failed deescalation in risk (dashed line) is an aberration in this expected sequential reduction in risk level. (E = error; ICU = intensive care unit; OR = operating room; T = threat; U = unintended state.)



CONGENITAL HEART DISEASE

National Aeronautics and Space Administration "threat and error" model applied to pediatric cardiac surgery: Error cycles precede ~85% of patient deaths

Edward J. Hickey, MD, Yaroslavna Nosikova, MSc, Eric Pham-Hung, BSc, Michael Gritti, BSc, Steven Schwartz, MD, Christopher A. Caldarone, MD, Andrew Redington, MD, and Glen S. Van Arsdell, MD

CHD

ABSTRACT

Background: We hypothesized that the National Aeronautics and Space Administration "threat and error" model (which is derived from analyzing >30,000 commercial flights, and explains >90% of crashes) is directly applicable to pediatric cardiac surgery.

Methods: We implemented a unit-wide performance initiative, whereby every surgical admission constitutes a "flight" and is tracked in real time, with the aim of identifying errors. The first 500 consecutive patients (524 flights) were analyzed, with an emphasis on the relationship between error cycles and permanent harmful outcomes.

Results: Among 524 patient flights

Schematic of threat and error cycle.

Central Message

In pediatric cardiac surgery, cycles of error and rescue may precede adverse outcomes. Managing threat and error cycles may improve patient safety.

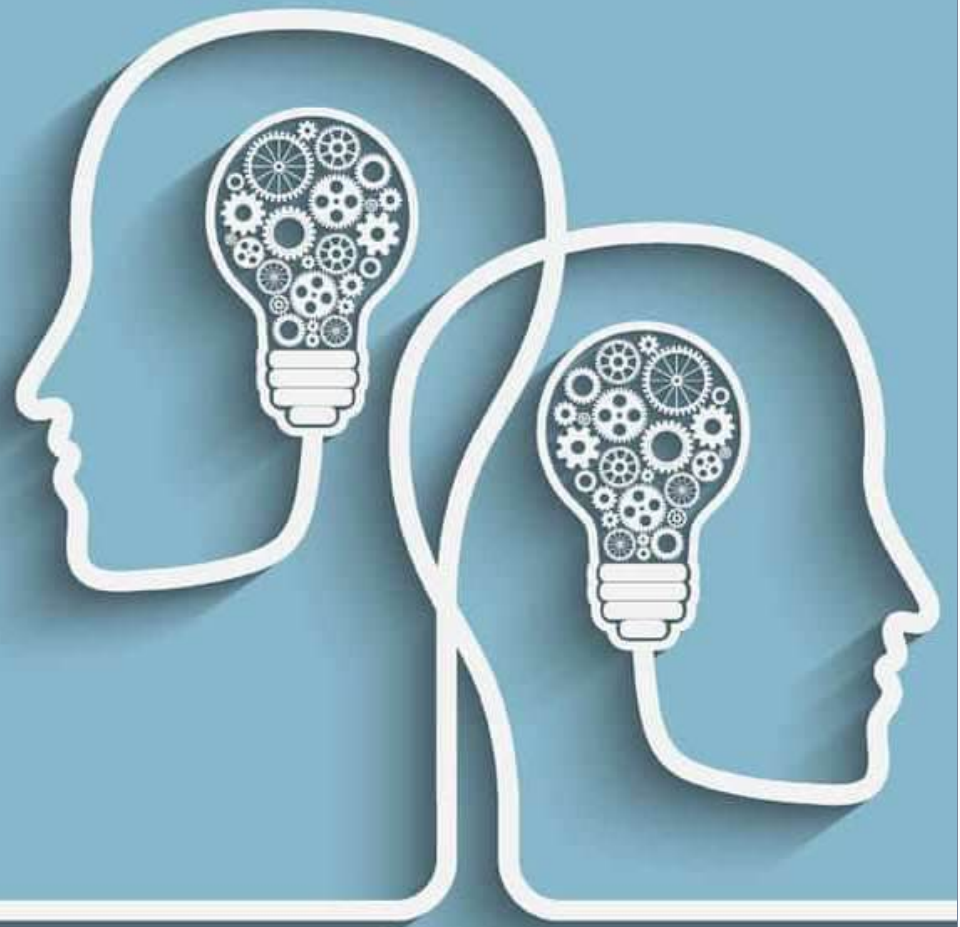
Clinical Relevance

This evaluation confirms that error was common and two thirds of these errors are consequential. The message derived from this experience is that when errors lead to an unintended deviation from the expected clinical course, extreme vigilance and optimal use of all available resources are required to prevent or break the threat and error cycle.

al material is available online.

ily functional Airbus A330 stalled at ssmerged after colliding belly first ocean with a forward velocity of only ines were fully powered, and all instru- ng correctly. A few minutes before the ane was in a completely unremarkable n, temporary icing of a pitot tube led nsient loss of airspeed data, and ent. The pilots responded with some flight-control inputs, which led to

Learning Cycle - Culture



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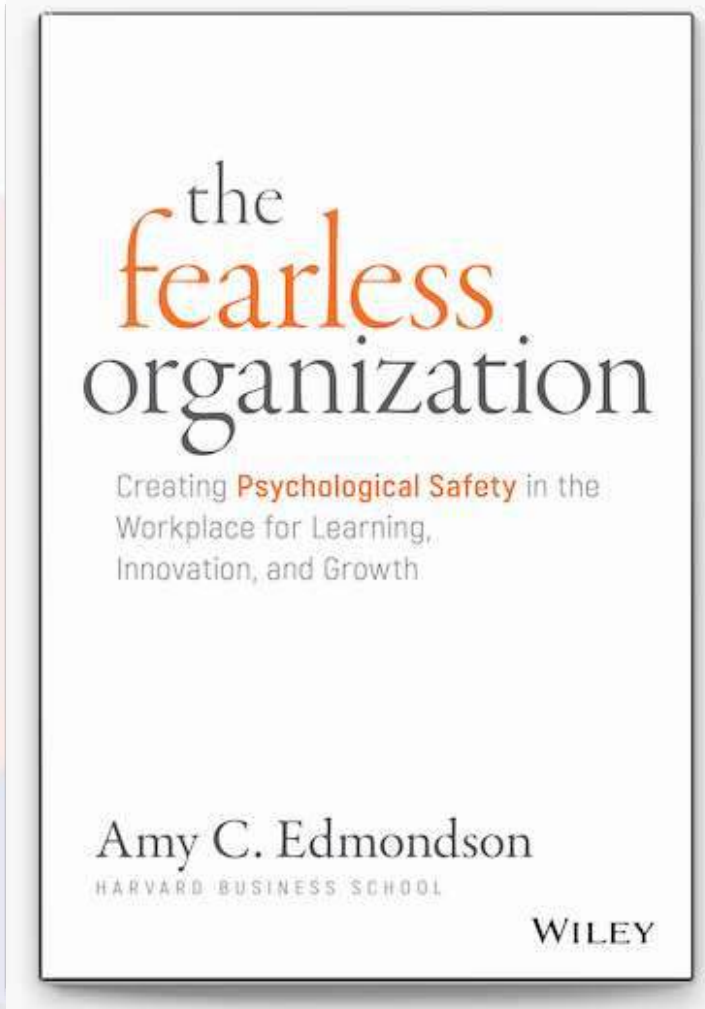
Culture

An Essential Component of a Positive Organizational Culture Which is Essential for Learning and Innovation is:-

PSYCHOLOGICAL SAFETY



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Culture

If we are to be a Learning Organization we need to combine high levels of Psychological Safety with an elevated sense of

ACCOUNTABILILTY

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Culture

An Essential Cultural Component For A Healing Relationship is

TRUST

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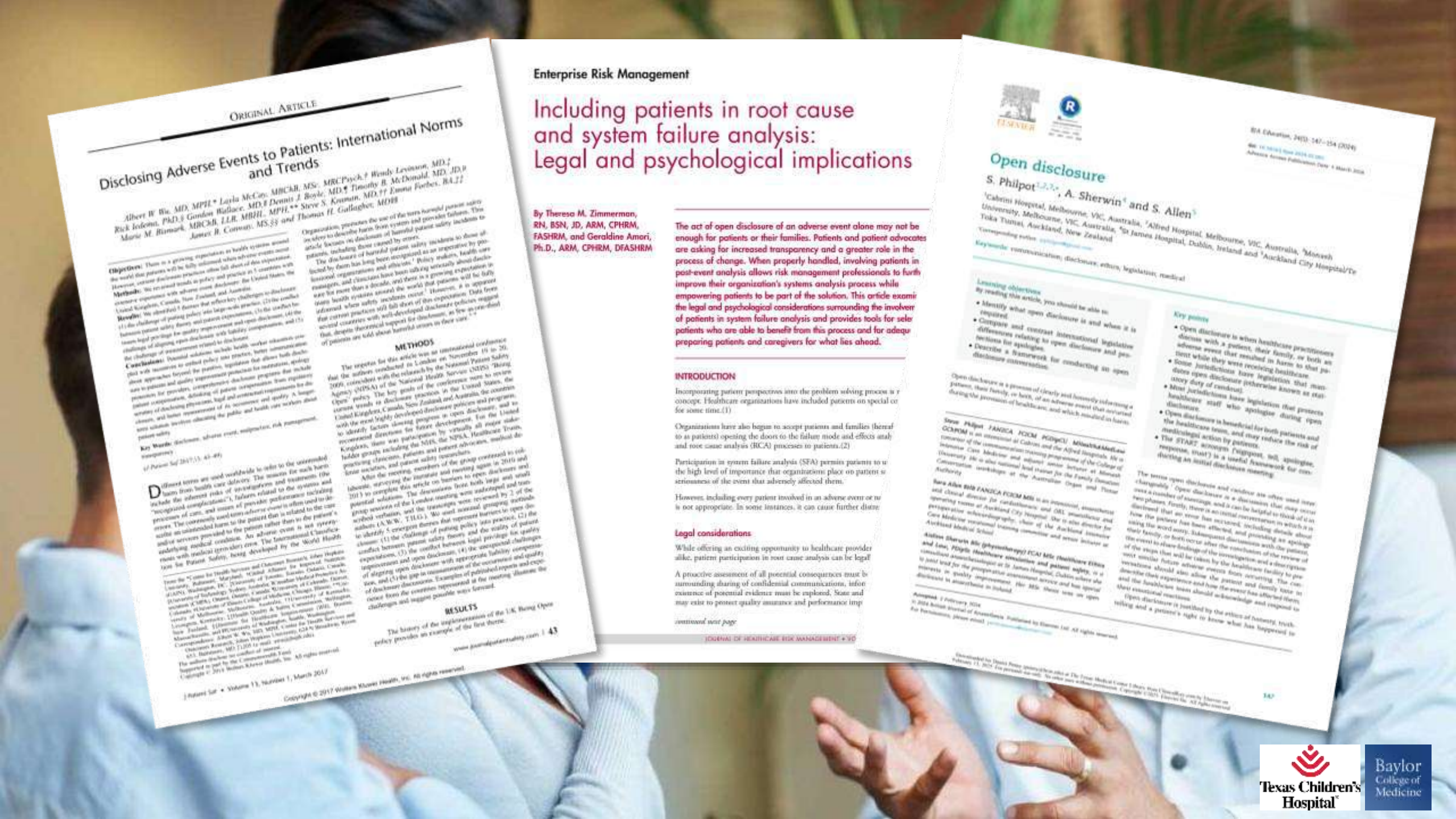

ORIGINAL ARTICLE

Disclosing Adverse Events to Patients: International Norms and Trends

Albert W. Wu, MD, MPH,* Layla McCay, MBChB, MSc, MRCPsych,† Wendy Levinson, MD,‡ Rick Iedema, PhD,§ Gordon Wallace, MD,‖ Dennis J. Boyle, MD,¶ Timothy B. McDonald, MD, JD,# Marie M. Bismark, MBChB, LLB, MBHL, MPH,** Steve S. Kraman, MD,†† Emma Forbes, BA,‡‡ James B. Conway, MS,§§ and Thomas H. Gallagher, MD‖‖

Objectives: There is a growing expectation in health systems around the world that patients will be fully informed when adverse events occur. However, current disclosure practices often fall short of this expectation.

Methods: We reviewed trends in policy and practice in 5 countries with extensive experience with adverse event disclosure: the United States, the United Kingdom, Canada, New Zealand, and Australia.

Results: We identified 5 themes that reflect key challenges to disclosure: (1) the challenge of putting policy into large-scale practice, (2) the conflict between patient safety theory and patient expectations, (3) the conflict between legal privilege for quality improvement and open disclosure, (4) the challenge of aligning open disclosure with liability compensation, and (5) the challenge of engagement related to disclosure.

Conclusions: Potential solutions include health worker education programs that go beyond the punitive, legislation that allows both disclosure and quality improvement protected for institutions, apology laws to patients and quality improvement protected for institutions, apology programs for providers, comprehensive disclosure programs that include patient compensation, defending of patient compensation from regulatory scrutiny of disclosing physicians, legal and contractual requirements for disclosure, and better representation of the consumer and quality. A longer term solution involves educating the public and health care workers about patient safety.

Key Words: disclosure, adverse event, malpractice, risk management, transparency

(*J Patient Saf* 2017;13: 65–69)

Different terms are used worldwide to refer to the unintended harms from health care delivery. The reasons for such harm include the inherent risks of investigations and treatments ("recognized complications"), failures related to the systems and processes of care, and issues of provider performance including errors. The commonly used term *adverse event* is often used to describe an unintended harm to the patient that is related to the care and/or services provided to the patient rather than to the patient's underlying medical condition. An adverse event is not synonymous with medical (provider) error. The International Classification for Patient Safety, being developed by the World Health Organization, promotes the use of the term *harmful patient safety incidents* to describe harm from system and provider failures. This article focuses on disclosure of harmful patient safety incidents to patients, including those caused by errors.

The disclosure of harmful patient safety incidents to those affected by them has long been recognized as an imperative by professional organizations and ethicists.[1] Policy makers, health care managers, and clinicians have been talking seriously about disclosure for more than a decade, and there is a growing expectation in many health systems around the world that patients will be fully informed when safety incidents occur.[2] However, it is apparent that current practices still fall short of this expectation. Data from several countries with well-developed disclosure policies suggest that, despite theoretical support for disclosure, as few as one-third of patients are told about harmful errors in their care.[3–5]

METHODS

The impetus for this article was an international conference that the authors conducted in London on November 19 to 20, 2009, coincident with the relaunch by the National Patient Safety Agency (NPSA) of the National Health Service (NHS) "Being Open" policy. The key goals of the conference were to review current trends in disclosure practices in the United States, the United Kingdom, Canada, New Zealand, and Australia; the countries with the most highly developed disclosure policies and programs. to identify factors slowing progress in open disclosure, and to recommend directions for future development. For the United Kingdom, there was participation by virtually all major stakeholder groups including the NHS, the NPSA, Healthcare Trusts, practicing clinicians, patients and patient advocates, medical defense societies, and patient safety researchers.

After the meeting, members of the group convened to collaborate, surveying the literature and meeting again in 2010 and 2013 to complete this article on barriers to open disclosure and potential solutions. The discussions from both large and small group sessions of the London meeting were audiotaped and transcribed verbatim, and the transcripts were reviewed by 2 of the authors (A.W.W., T.H.G.). We used nominal grouping methods to identify 5 emergent themes that represent barriers to open disclosure: (1) the challenge of putting policy into practice, (2) the conflict between patient safety theory and the reality of patient expectations, (3) the conflict between legal privilege for quality improvement and open disclosure, (4) the unexpected challenges of aligning open disclosure with appropriate liability compensation, and (5) the gap in communication of the occurrence and quality of disclosure discussions. Examples of published reports and experience from the countries represented at the meeting illustrate the challenges and suggest possible ways forward.

RESULTS

The history of the implementation of the UK Being Open policy provides an example of the first theme.

From the *Centre for Health Services and Outcomes Research, Johns Hopkins University, Baltimore, Maryland; †Child and Adolescent Research, Johns Hopkins SAIMS, Washington, DC; ‡University of Toronto, Toronto, Ontario, Canada; §UNSW, Sydney, Australia; ‖Canadian Medical Protective Association, Ottawa, Ontario; ¶Mount Sinai Medical Center, Miami, Florida; #University of Colorado, Denver, Colorado; **Melbourne Law School, University of Melbourne, Melbourne, Australia; ††University of Kentucky, Lexington, Kentucky; ‡‡Middle Tennessee State University, Murfreesboro, Tennessee; §§Institute for Healthcare Improvement (IHI), Boston, Massachusetts; and ‖‖University of Washington, Seattle, Washington.

Correspondence: Albert W. Wu, MD, MPH, Center for Health Services and Outcomes Research, Johns Hopkins University, 624 N Broadway, Room 653, Baltimore, MD 21205 (e-mail: awu@jhsph.edu).

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Enterprise Risk Management

Including patients in root cause and system failure analysis: Legal and psychological implications

By Theresa M. Zimmerman, RN, BSN, JD, ARM, CPHRM, FASHRM, and Geraldine Amori, Ph.D., ARM, CPHRM, DFASHRM

The act of open disclosure of an adverse event alone may not be enough for patients or their families. Patients and patient advocates are asking for increased transparency and a greater role in the process of change. When properly handled, involving patients in post-event analysis allows risk management professionals to furth improve their organization's systems analysis process while empowering patients to be part of the solution. This article exami the legal and psychological considerations surrounding the involvem of patients in system failure analysis and provides tools for sele patients who are able to benefit from this process and for adequ preparing patients and caregivers for what lies ahead.

INTRODUCTION

Incorporating patient perspectives into the problem solving process is r concept. Healthcare organizations have included patients on special co for some time.(1)

Organizations have also begun to accept patients and families (hereaf to as patients) opening the doors to the failure mode and effects analy and root cause analysis (RCA) processes to patients.(2)

Participation in system failure analysis (SFA) permits patients to u the high level of importance that organizations place on patient s seriousness of the event that adversely affected them.

However, including every patient involved in an adverse event or ne is not appropriate. In some instances, it can cause further distre

Legal considerations

While offering an exciting opportunity to healthcare provider alike, patient participation in root cause analysis can be legall

A proactive assessment of all potential consequences must b surrounding sharing of confidential communications, infor existence of potential evidence must be explored. State and may exist to protect quality assurance and performance imp

continued next page

BJA Education, 24(5): 147–154 (2024)

Open disclosure

S. Philpot[1,2,3,*], A. Sherwin[4] and S. Allen[5]

[1]Cabrini Hospital, Melbourne, VIC, Australia, [2]Alfred Hospital, Melbourne, VIC, Australia, [3]Monash University, Melbourne, VIC, Australia, [4]St James Hospital, Dublin, Ireland and [5]Auckland City Hospital/Te Toka Tumai, Auckland, New Zealand

*Corresponding author.

Keywords: communication; disclosure; ethics; legislation; medical

Learning objectives

By reading this article, you should be able to:

- Identify what open disclosure is and when it is required.
- Compare and contrast international legislative differences relating to open disclosure and protections for apologies.
- Describe a framework for conducting an open disclosure conversation.

Key points

- Open disclosure is when healthcare practitioners discuss with a patient, their family, or both an adverse event that resulted in harm to that patient while they were receiving healthcare.
- Some jurisdictions have legislation that mandates open disclosure (otherwise known as statutory duty of candour).
- Most jurisdictions have legislation that protects healthcare staff who apologise during open disclosure.
- Open disclosure is beneficial for both patients and the healthcare team, and may reduce the risk of medicolegal action by patients.
- The START acronym (signpost, tell, apologise, response, trust) is a useful framework for conducting an initial disclosure meeting.

Open disclosure is a process of clearly and honestly informing a patient, their family, or both, of an adverse event that occurred during the provision of healthcare, and which resulted in harm.

Steve Philpot *FANZCA FCCM FCEM(UK) MMedVetMedLaw GCHPEM* is an intensivist at Cabrini and the Alfred Hospitals. He is convenor of the communication training programme of the College of Intensive Care Medicine and adjunct senior lecturer at Monash University. He is also national lead trainer for the Family Donation Conversation workshops at the Australian Organ and Tissue Authority.

Sara Allen *BHB FANZCA FCCM MBe* is an intensivist, anaesthetist and clinical director for cardiothoracic and ORL anaesthesia and operating rooms at Auckland City Hospital. She is also director for perioperative echocardiography, chair of the Auckland innovative Care Medicine vocational training committee and senior lecturer at Auckland Medical School.

Aislinn Sherwin *BSc (physiotherapy) FCAI MSc (Healthcare Ethics and Law), PGDip (Healthcare simulation and patient safety)*, is a consultant anaesthesiologist at St James Hospital, Dublin where she is joint lead for the perioperative assessment service and has special interests in quality improvement. Her MSc thesis was on open disclosure in anaesthesia in Ireland.

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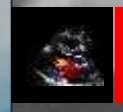
THE New York Times BESTSELLER

FAILURE IS INEVITABLE



Failure at The Cutting Edge of Modern Medicine

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JMW Turner

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Potentially we are at risk of our greatest failure of all. That will be our failure to develop the culture and systems so that we can learn from the failures which are inevitable in our care.