ATW HEALTH SOLUTIONS™

Harm and Injury Investigation

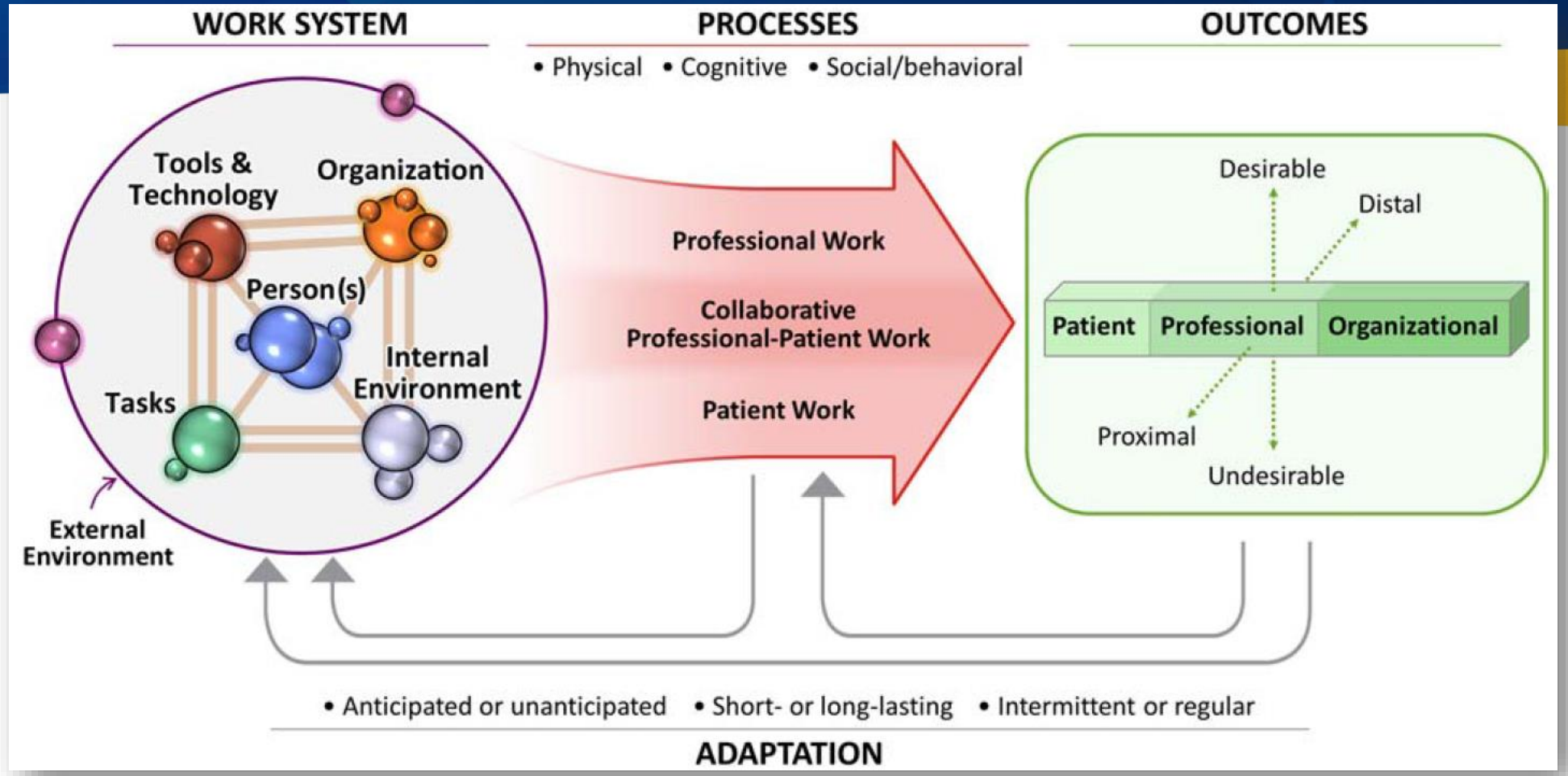
Gerry Castro, PhD, MPH
Managing Director of Research,
Policy, and Quality Improvement

Learning Objectives

ATW HEALTH SOLUTIONS™

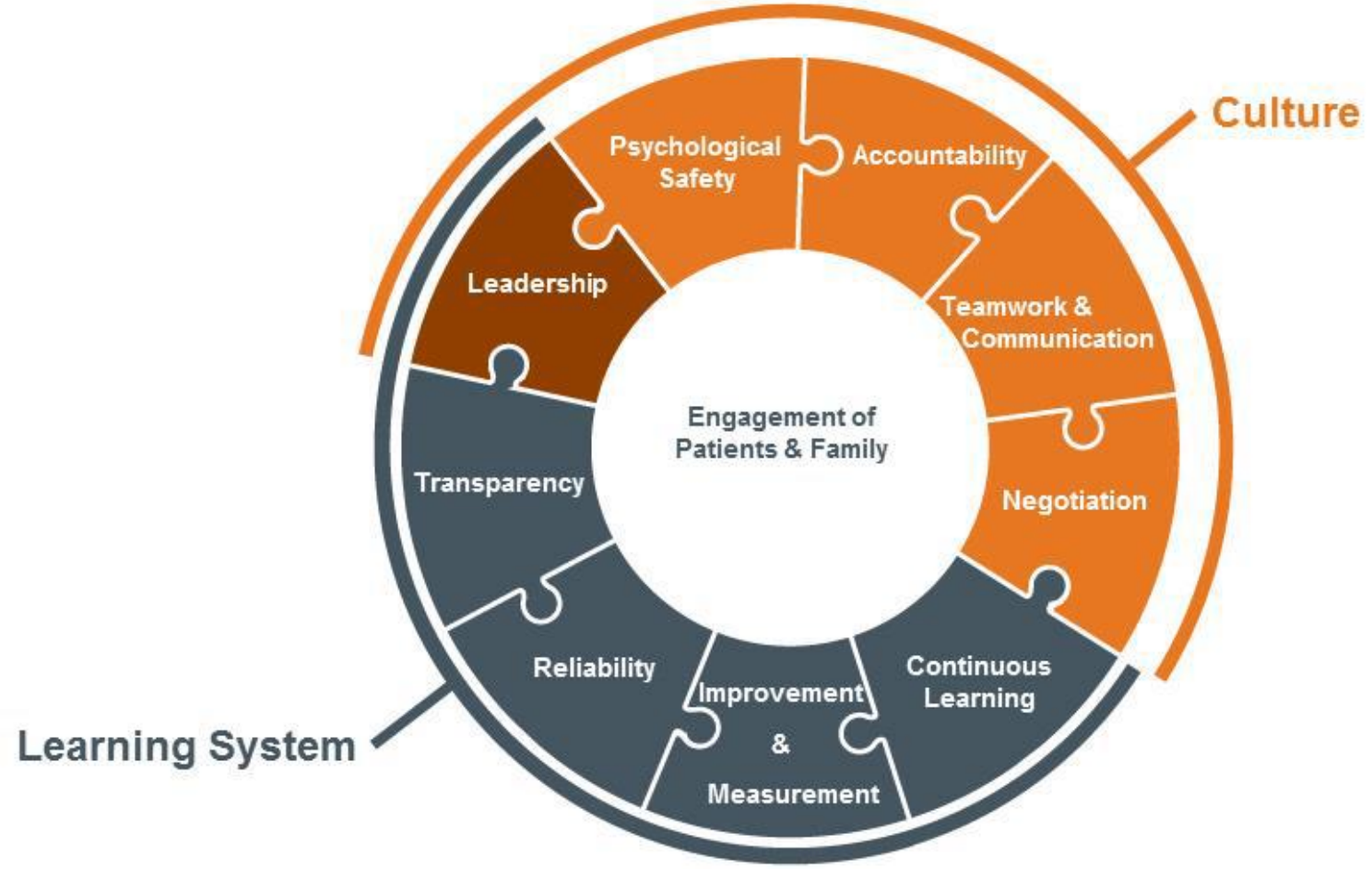
1. Describe how the complex healthcare system leads to error or injury
2. Compare and contrast different investigation and analysis methods
3. Implement changes to the current investigation process used at your facility

Sociotechnical Models



Holden RJ, Carayon P, Gurses AP, Hoonakker P, Hundt AS, Ozok AA, Rivera-Rodriguez AJ. SEIPS 2.0: a human factors framework for studying and improving the work of healthcare professionals and patients. *Ergonomics*. 2013;56(11):1669-86.

IHI Framework for Safe, Reliable, and Effective Care



Frankel A, Haraden C, Federico F, Lenoci-Edwards J. A Framework for Safe, Reliable, and Effective Care. White Paper. Cambridge, MA: Institute for Healthcare Improvement and Safe & Reliable Healthcare; 2017.

Role of Organization Leaders

ATW HEALTH SOLUTIONS™

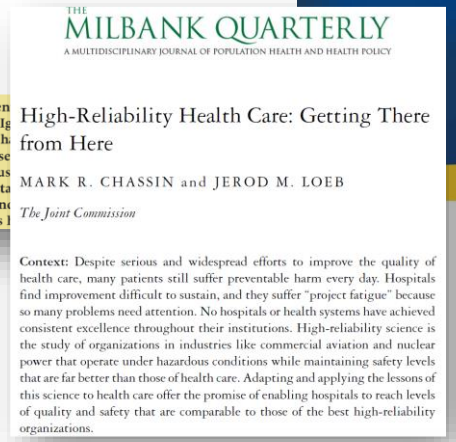
	Me	Encouraged my staff
Promote learning		
Motivate staff to uphold a fair and just safety culture		
Provide a transparent environment in which patient safety events are honestly reported		
Model professional behavior		
Remove intimidating behavior that might inhibit a culture of safety		
Provide the resources and training necessary to take on improvement initiatives		


THE QUALITY JOURNEY

By Mark R. Chassin and Jerod M. Loeb

The Ongoing Quality Improvement Journey: Next Stop, High Reliability

ABSTRACT Quality improvemen
includes such epic figures as Ig
obstetrician who introduced h
Nightingale, the English nurse
conditions were a leading caus
hospitals. Systematic and susta
particular has a more brief an
years, a variety of approaches


THE MILBANK QUARTERLY

A MULTIDISCIPLINARY JOURNAL OF POPULATION HEALTH AND HEALTH POLICY

High-Reliability Health Care: Getting There from Here

MARK R. CHASSIN and JEROD M. LOEB

The Joint Commission

Context: Despite serious and widespread efforts to improve the quality of health care, many patients still suffer preventable harm every day. Hospitals find improvement difficult to sustain, and they suffer "project fatigue" because so many problems need attention. No hospitals or health systems have achieved consistent excellence throughout their institutions. High-reliability science is the study of organizations in industries like commercial aviation and nuclear power that operate under hazardous conditions while maintaining safety levels that are far better than those of health care. Adapting and applying the lessons of this science to health care offer the promise of enabling hospitals to reach levels of quality and safety that are comparable to those of the best high-reliability organizations.


Safer Together

A National Action Plan to Advance Patient Safety

The **Institute for Healthcare Improvement** convened the **National Steering Committee for Patient Safety** as a collaboration among 27 national organizations committed to advancing patient safety.

Recommendation 13. Facilitate both intra- and inter-organizational learning. All health care organizations must take steps to become collaborative learning organizations by using high-reliability principles, ensuring robust learning feedback loops, and engaging with established local, regional, state, or national learning systems.

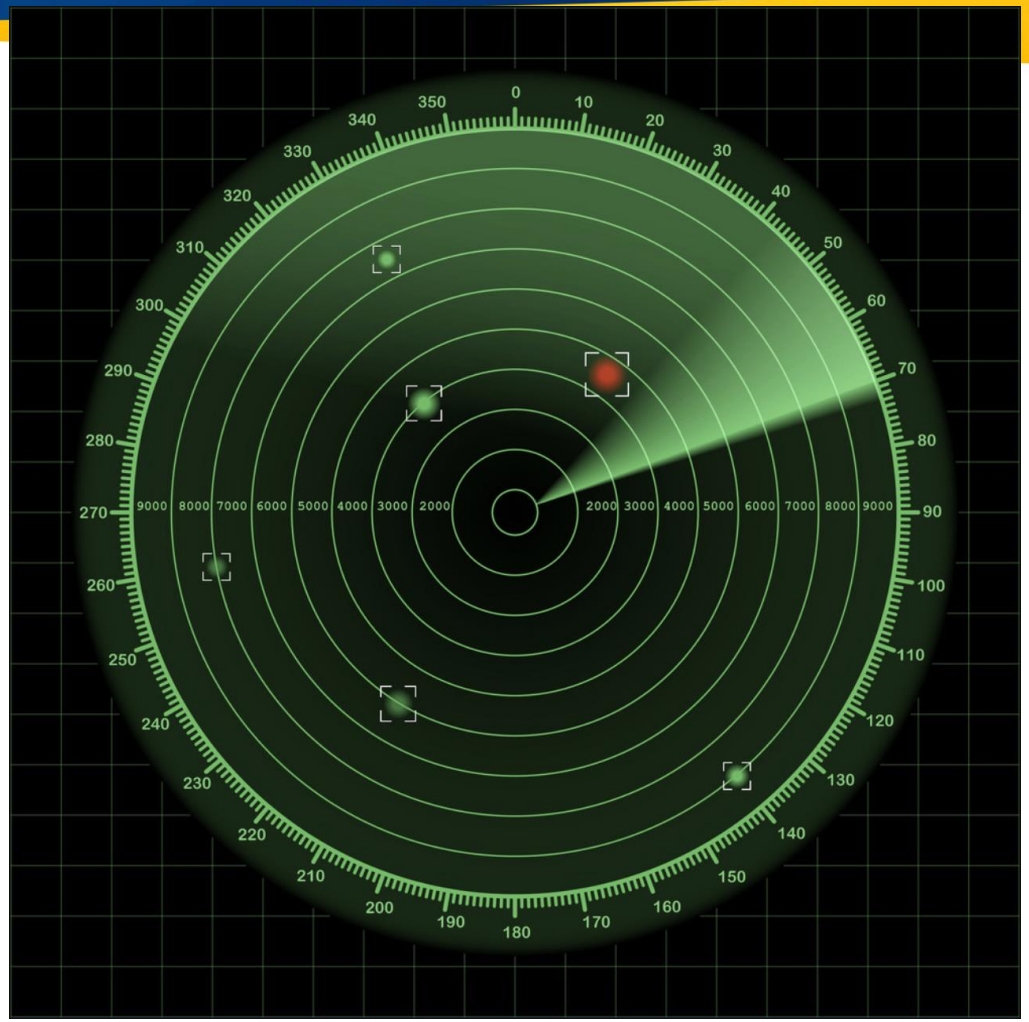
Tactic 13b. Develop and implement processes to systematically learn from safety events, including input from patients, families, care partners, and health care professionals at the point of care. Integrate lessons learned into the process of setting goals and priorities for interventions to improve patient safety.

Chassin MR, Loeb JM. The ongoing quality improvement journey: next stop, high reliability. *Health Aff (Millwood)*. 2011 Apr;30(4):559-68.

Chassin MR, Loeb JM. High-reliability health care: getting there from here. *Milbank Q*. 2013 Sep;91(3):459-90.

National Steering Committee for Patient Safety. Safer Together: A National Action Plan to Advance Patient Safety. Boston, Massachusetts: Institute for Healthcare Improvement; 2020. Available at www.ihi.org/SafetyActionPlan.

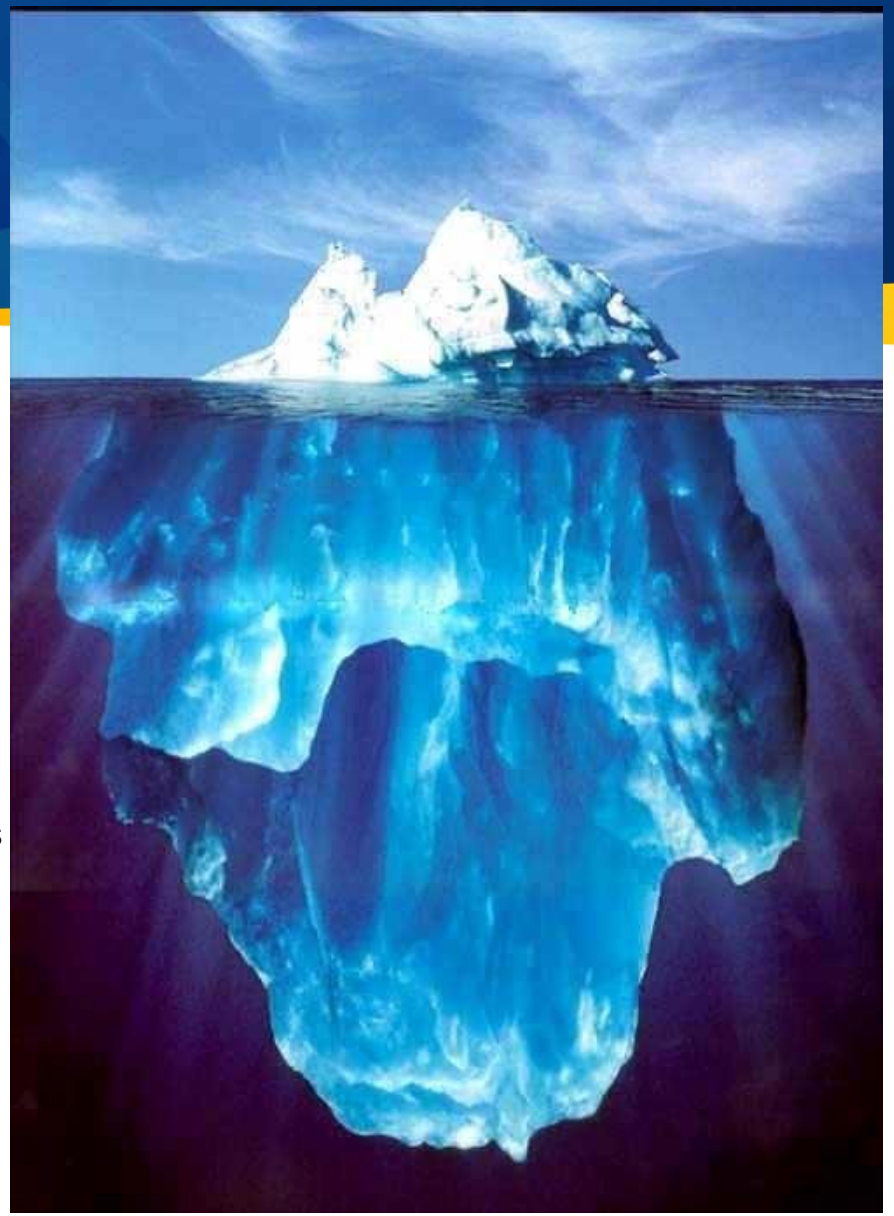
Learning about and analyzing events



Safety event reporting in healthcare

ATW HEALTH SOLUTIONS™

- Patients, frontline healthcare workers become aware of a problem or concern and file a report
- Collect information on the issue (who, what, where, and why)
- Analyze what happened in the individual incident
- Develop ways to reduce the likelihood of it happening again
- Aggregate data and prioritize which aspects of a healthcare system need to be addressed
- Shares with others to make others aware of a problem that may occur



Accidents
Adverse events

Near misses
Dangerous situations
Errors
Deviations
Precursor events
Hazards
Missed opportunities

Adapted from:
Battles JB, Kaplan HS, Van der Schaaf TW, Shea CE. The attributes of medical event-reporting systems: experience with a prototype medical event-reporting system for transfusion medicine. *Arch Pathol Lab Med*. 1998 Mar;122(3):231-8.

Patient Safety Events

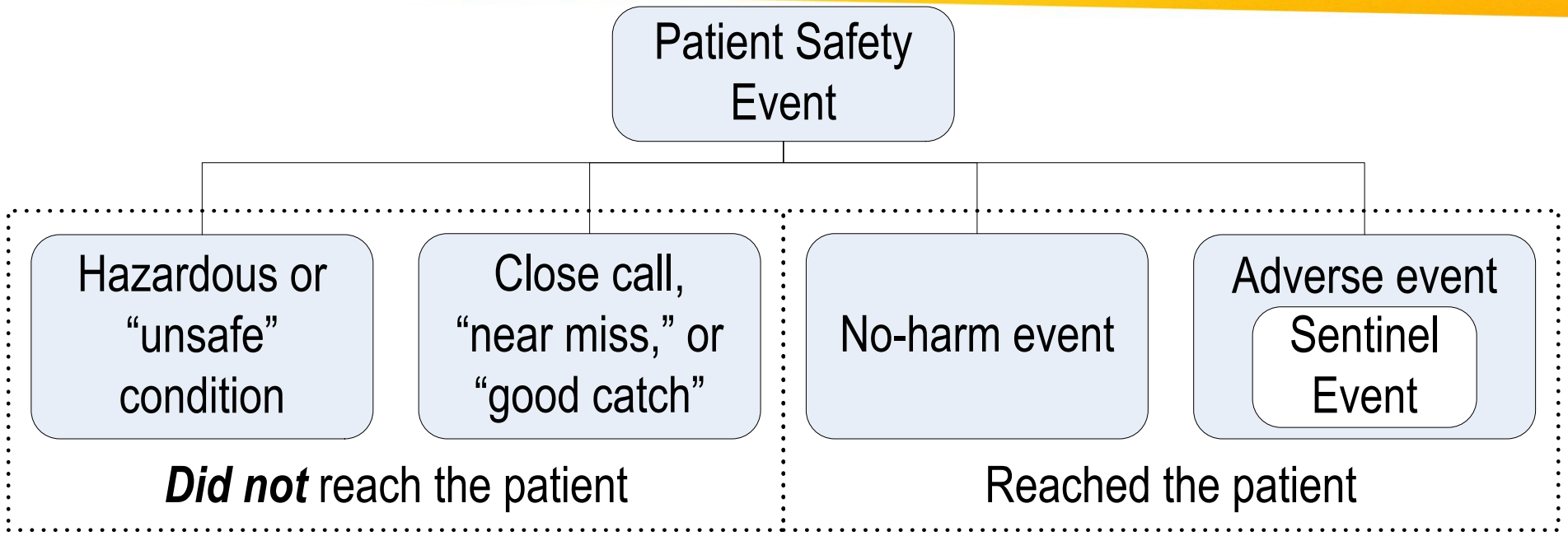
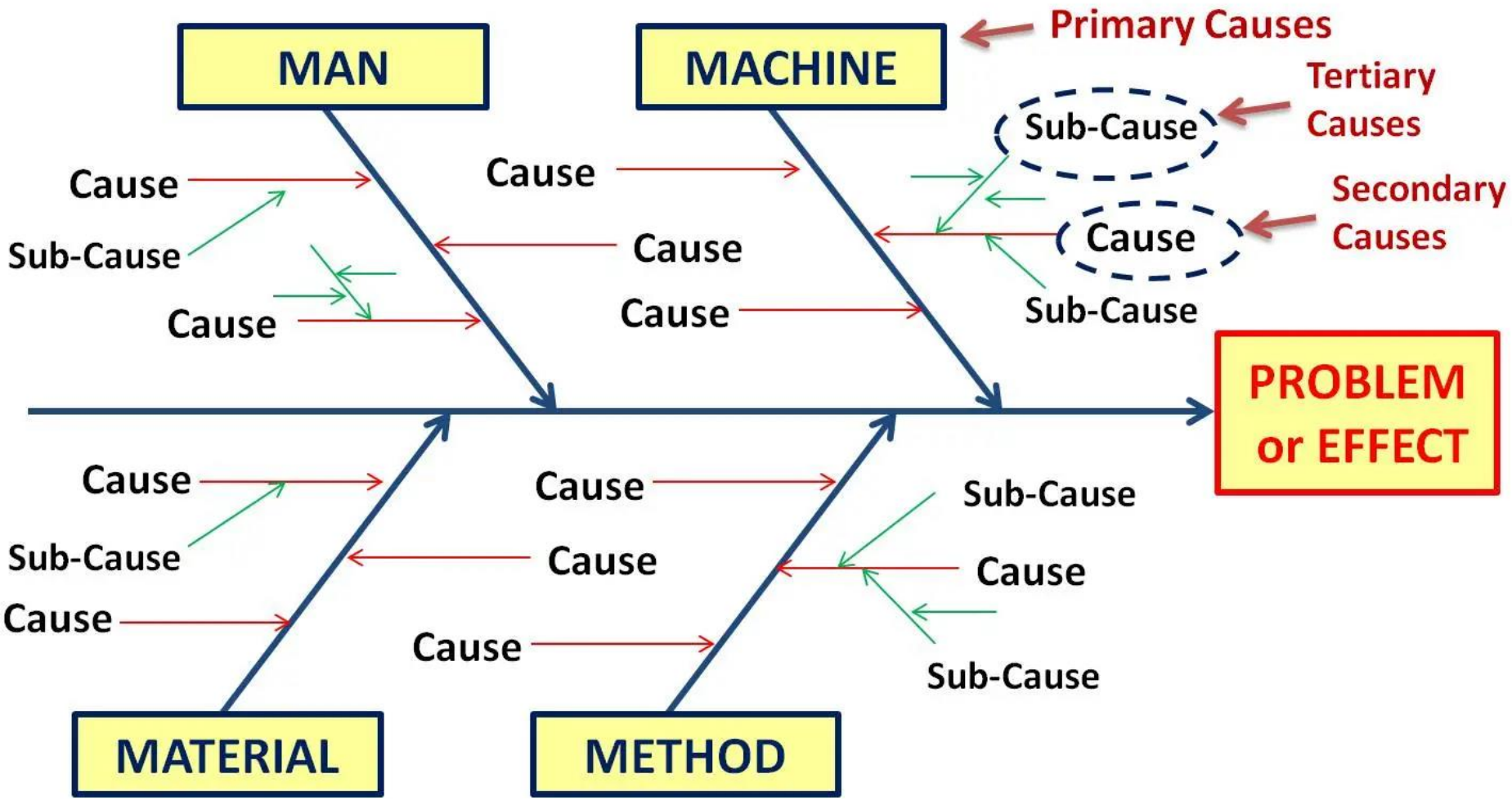


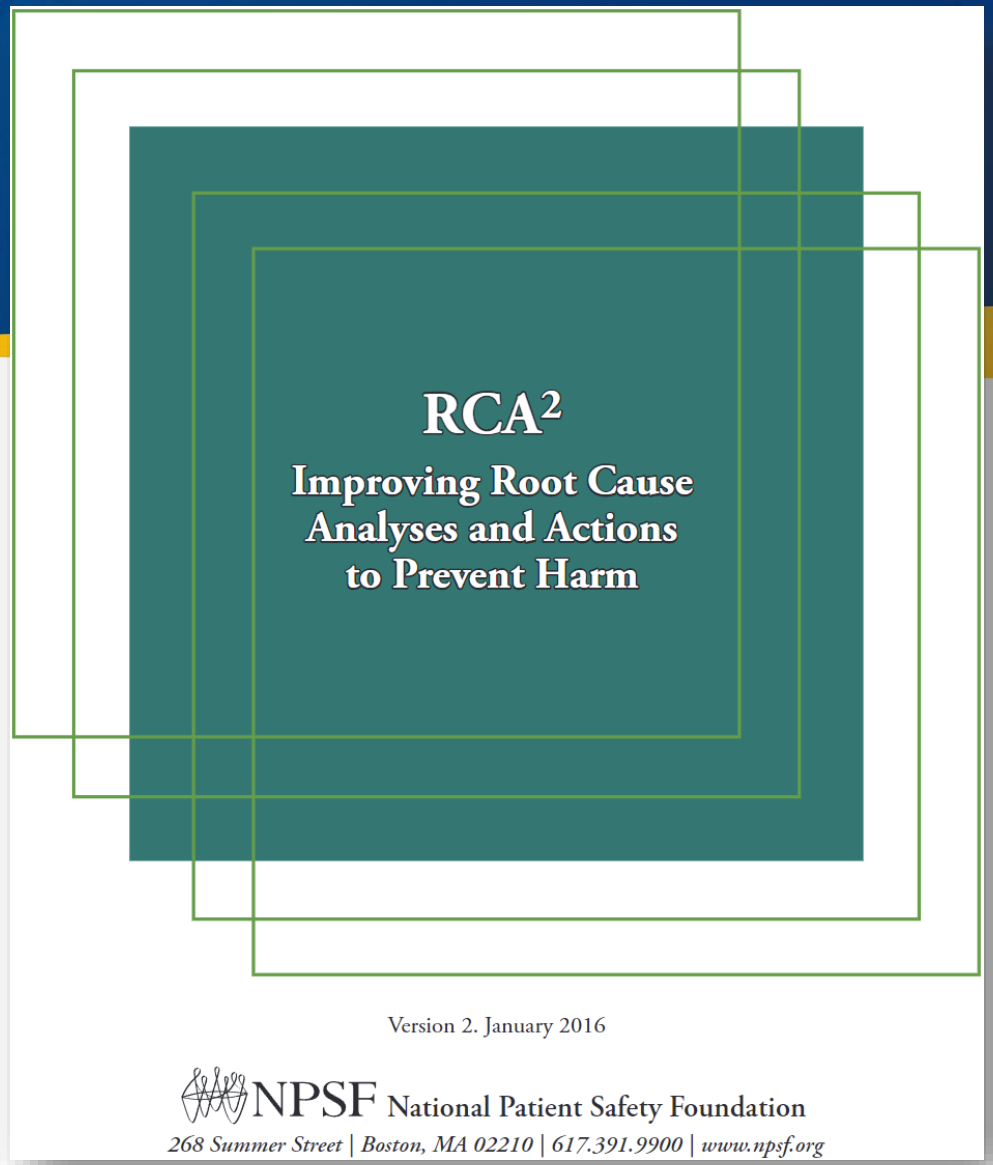
Table 1. Advantages and Disadvantages of Methods Used to Measure Errors and Adverse Events in Health Care

Error Measurement Method	Examples*	Advantages	Disadvantages
Morbidity and mortality conferences and autopsy	16–21	Can suggest latent errors Familiar to health care providers and required by accrediting groups	Hindsight bias Reporting bias Focused on diagnostic errors Infrequently and nonrandomly utilized
Malpractice claims analysis	25–28	Provides multiple perspectives (patients, providers, lawyers) Can detect latent errors	Hindsight bias Reporting bias Nonstandardized source of data
Error reporting systems	29–35	Can detect latent errors Provide multiple perspectives over time Can be a part of routine operations	Reporting bias Hindsight bias
Administrative data analysis	36–40	Utilizes readily available data Inexpensive	May rely upon incomplete and inaccurate data The data are divorced from clinical context
Chart review	41–44	Utilizes readily available data Commonly used	Judgements about adverse events not reliable Expensive Medical records are incomplete Hindsight bias
Electronic medical record	45, 46	Inexpensive after initial investment Monitors in real time Integrates multiple data sources	Susceptible to programming and/or data entry errors Expensive to implement Not good for detecting latent errors
Observation of patient care	47–50	Potentially accurate and precise Provides data otherwise unavailable Detects more active errors than other methods	Expensive Difficult to train reliable observers Potential Hawthorne effect Potential concerns about confidentiality Possible to be overwhelmed with information Potential hindsight bias Not good for detecting latent errors
Clinical surveillance	53, 54	Potentially accurate and precise for adverse events	Expensive Not good for detecting latent errors

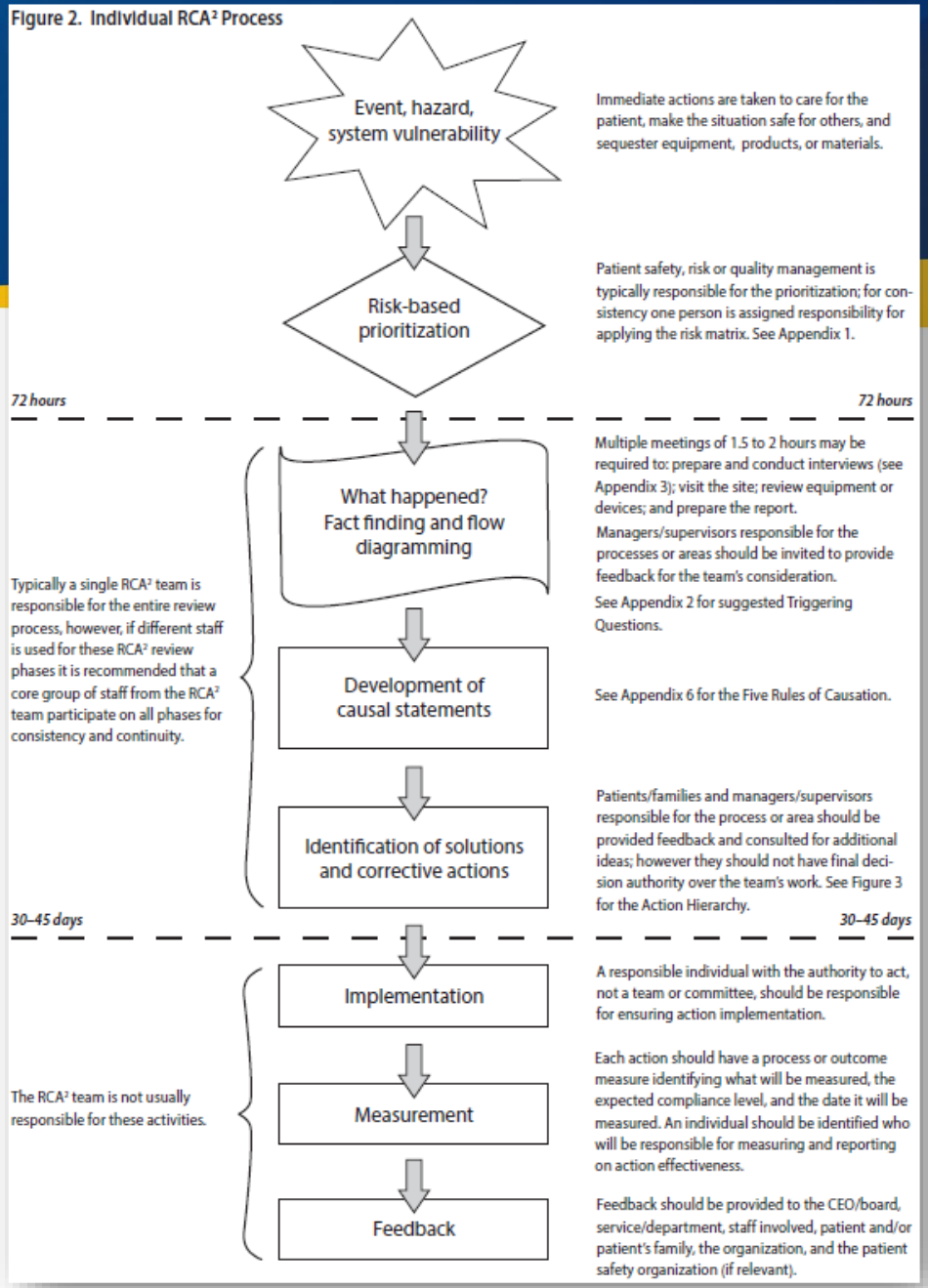
Thomas EJ, Petersen LA. Measuring errors and adverse events in health care. *J Gen Intern Med*. 2003 Jan;18(1):61-7.

CAUSE AND EFFECT DIAGRAM



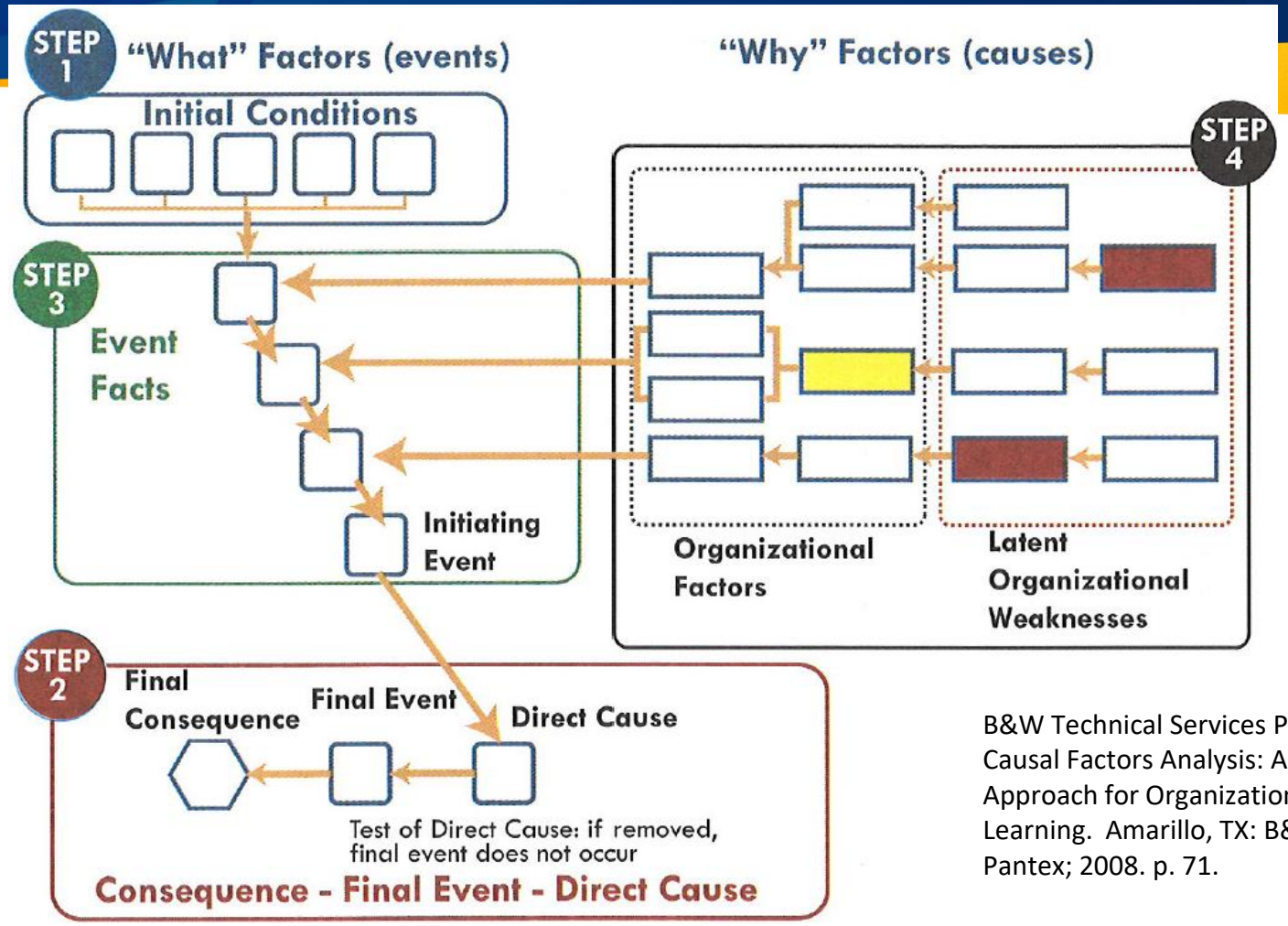


NPSF. RCA2: Improving Root Cause Analyses and Actions to Prevent Harm. 2016. http://www.ihi.org/resources/Pages/Tools/RCA2-Improving-Root-Cause-Analyses-and-Actions-to-Prevent-Harm.aspx



NPSF. RCA2: Improving Root Cause Analyses and Actions to Prevent Harm. 2016. http://www.ihi.org/resources/Pages/Tools/RCA2-Improving-Root-Cause-Analyses-and-Actions-to-Prevent-Harm.aspx

Contributing Factor Analysis

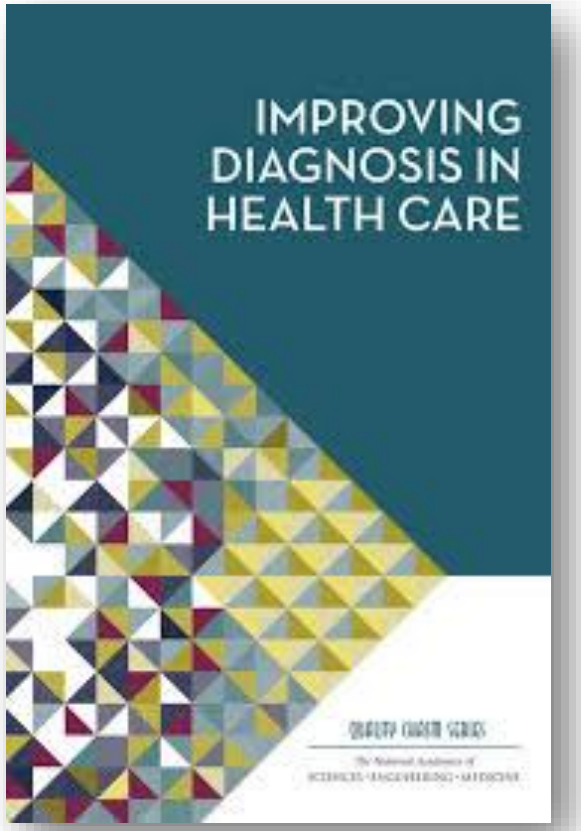


B&W Technical Services Pantex. Causal Factors Analysis: An Approach for Organizational Learning. Amarillo, TX: B&W Pantex; 2008. p. 71.

What’s next?

What is a Diagnostic Error?

ATW HEALTH SOLUTIONS™



The failure to:

(a) establish an **accurate** and **timely** explanation of the patient's health problem(s)

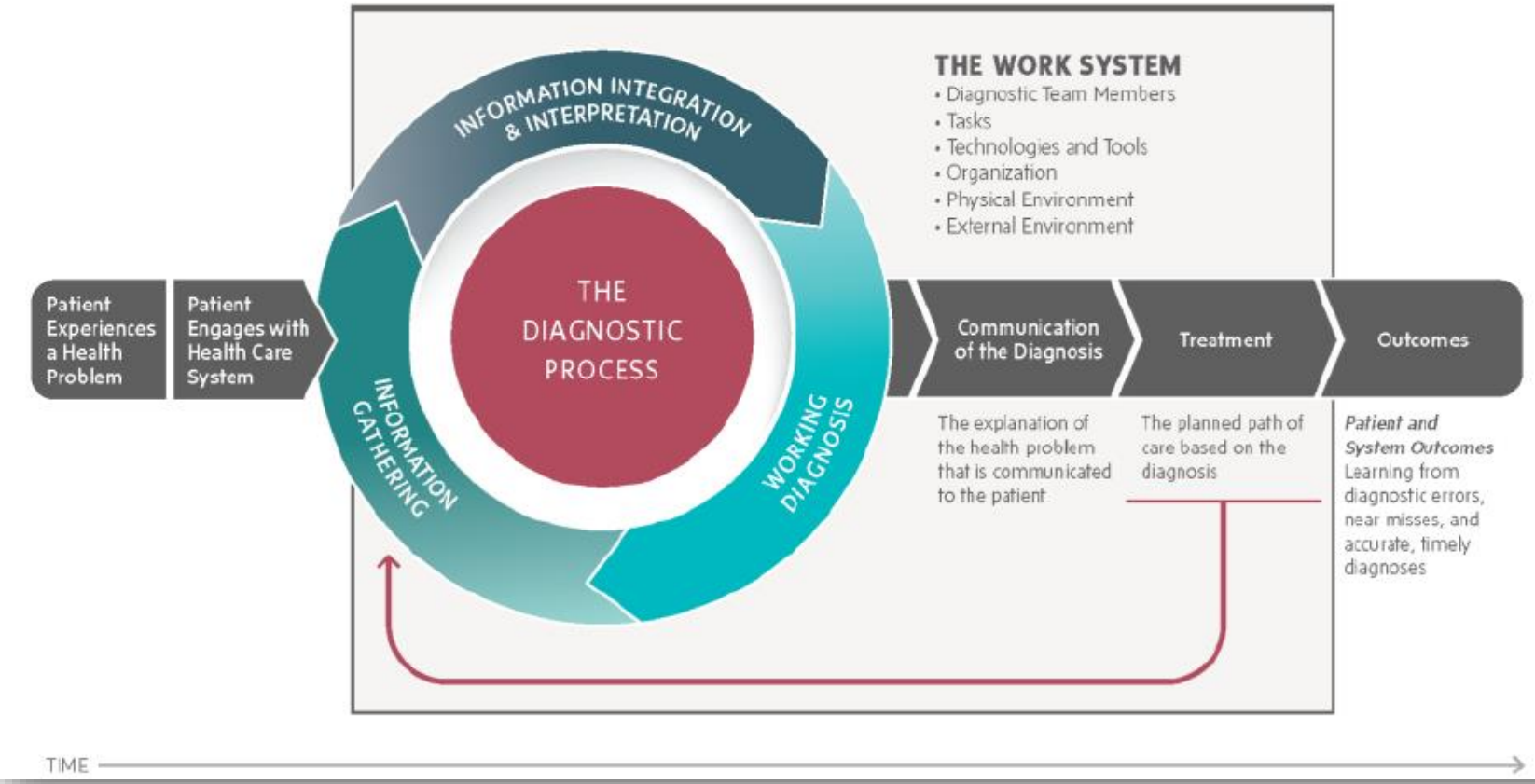
or

(b) **communicate** that explanation to the patient

National Academies of Sciences, Engineering, and Medicine. *Improving diagnosis in health care.* Washington, DC: The National Academies Press. 2015.

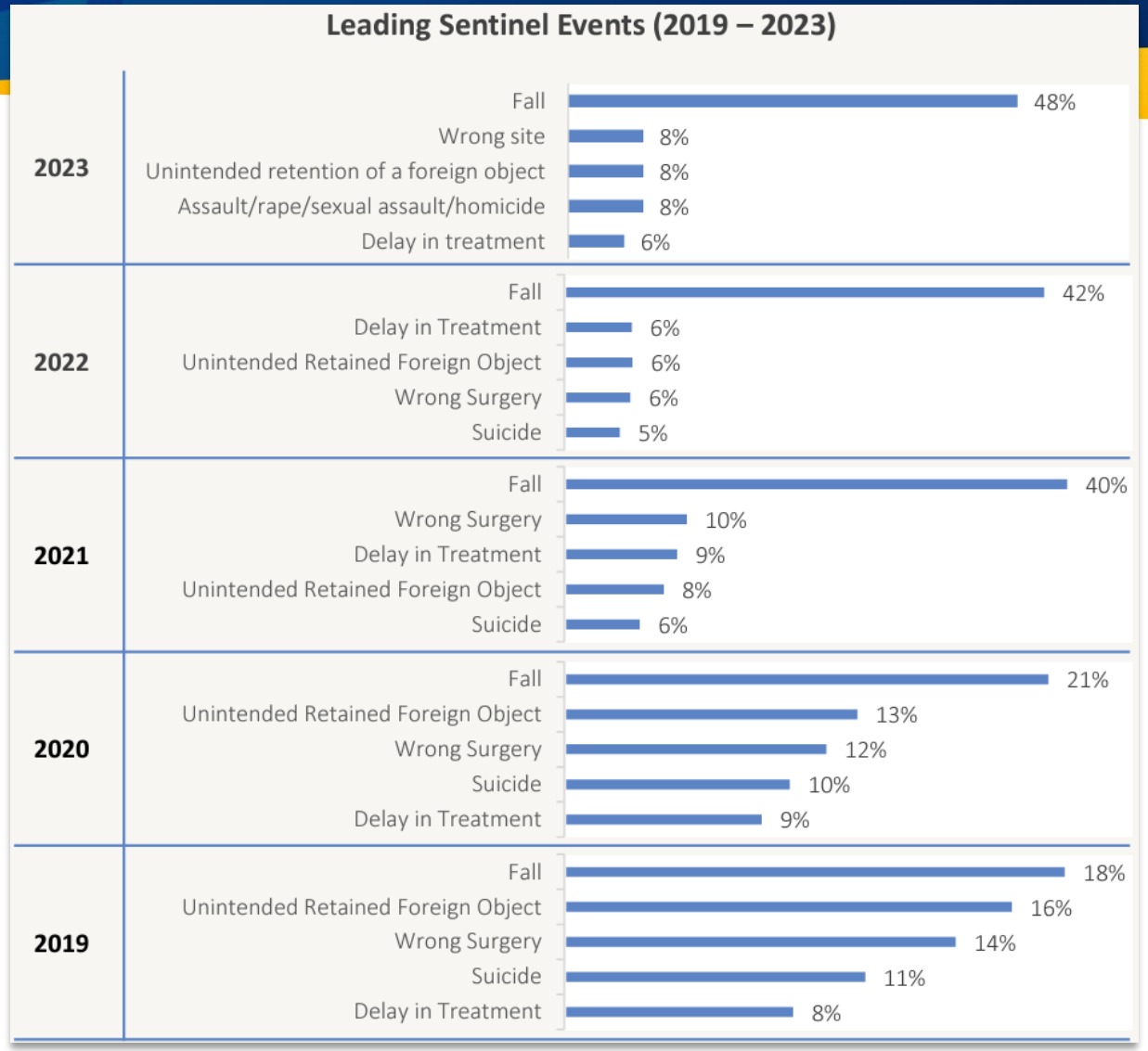
Where Failures in the Diagnostic Process Occur

- Failure of Engagement
- Failure in Information Gathering
- Failure in Information Integration
- Failure in Information Interpretation
- Failure to Establish an Explanation for the Health Problem
- Failure to Communicate the Explanation



National Academies of Sciences, Engineering, and Medicine. 2015. *Improving diagnosis in health care.* Washington, DC: The National Academies Press.

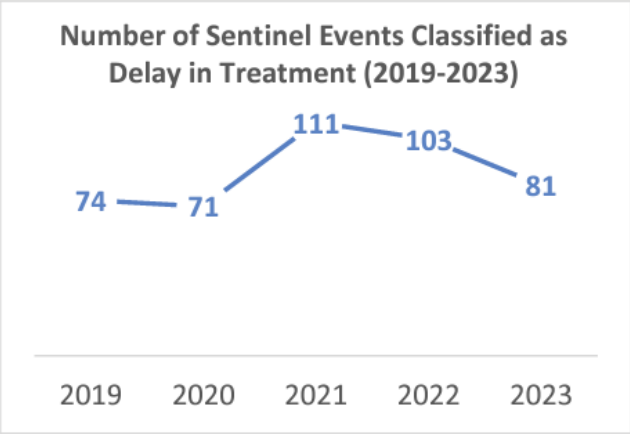
Joint Commission Most Commonly Reviewed Sentinel Event Types



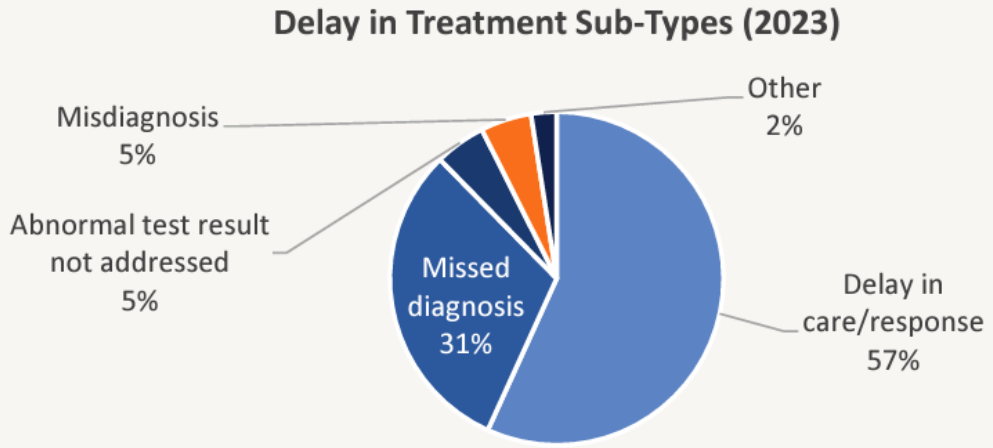
Available online at:
https://www.jointcommission.org/resources/patient-safety-topics/sentinel-event/sentinel-event-data-event-type-by-year/

Delay in Treatment

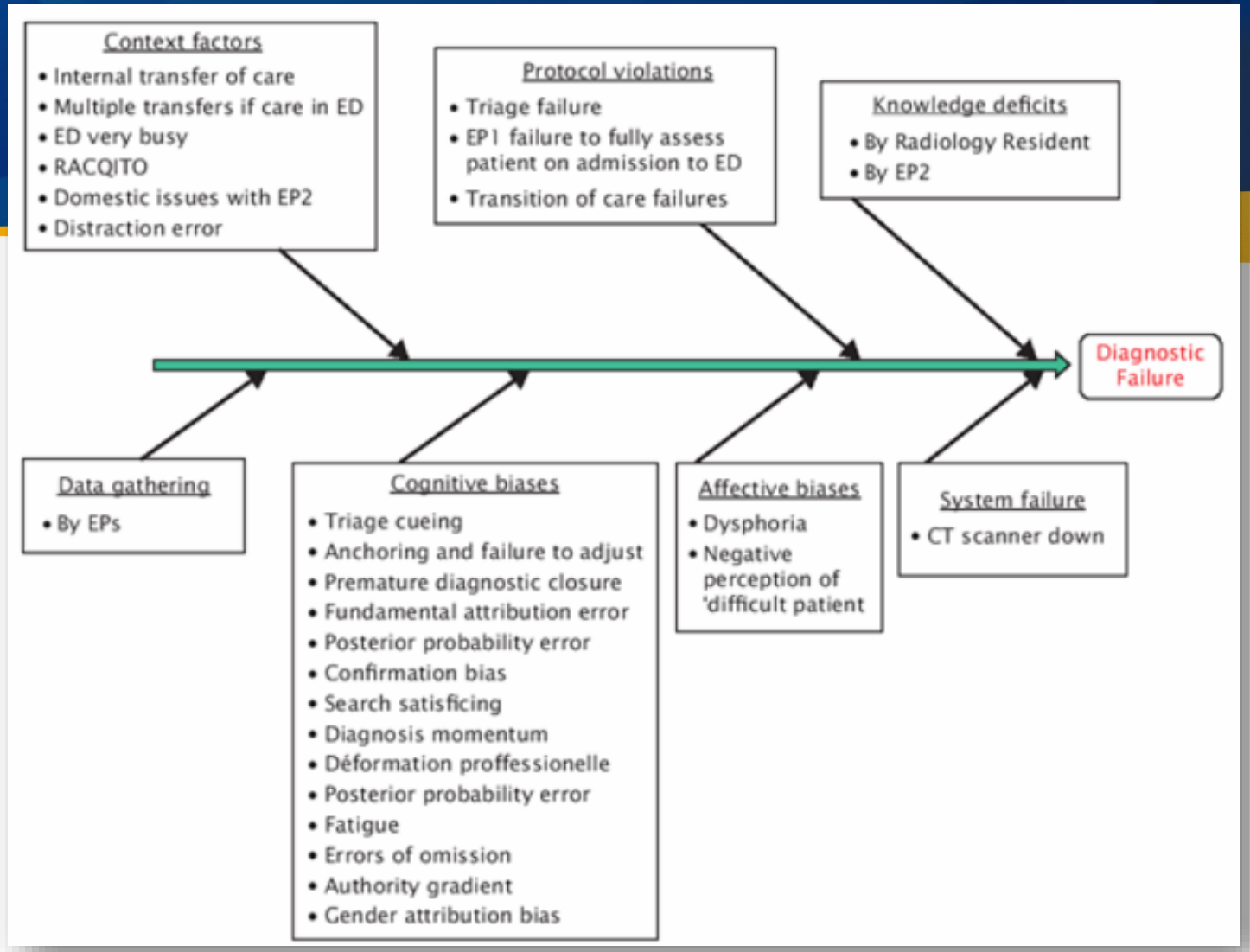
Sentinel events classified as delay in treatment continued to decrease in 2023 as compare to 2022 and 2021. Outcomes associated with delays in treatment largely resulted in death (69%) followed by severe harm (26%) and permanent harm (5%).



Of delay in treatment sentinel events in 2023, 57% were associated with delays in care/response to a decompensating condition and 31% were due to a missed diagnosis.

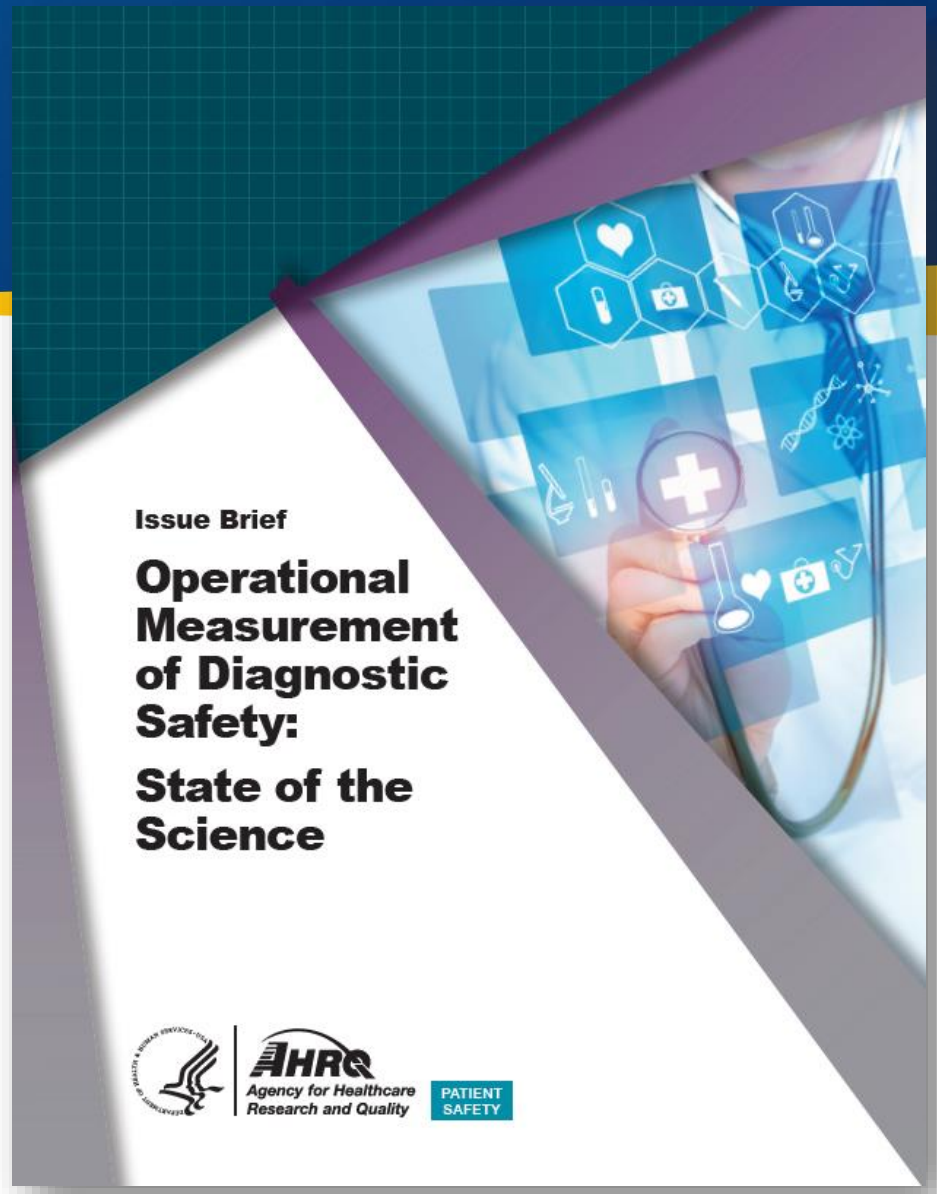


Available online at:
https://www.jointcommission.org/resources/patient-safety-topics/sentinel-event/sentinel-event-data-event-type-by-year/

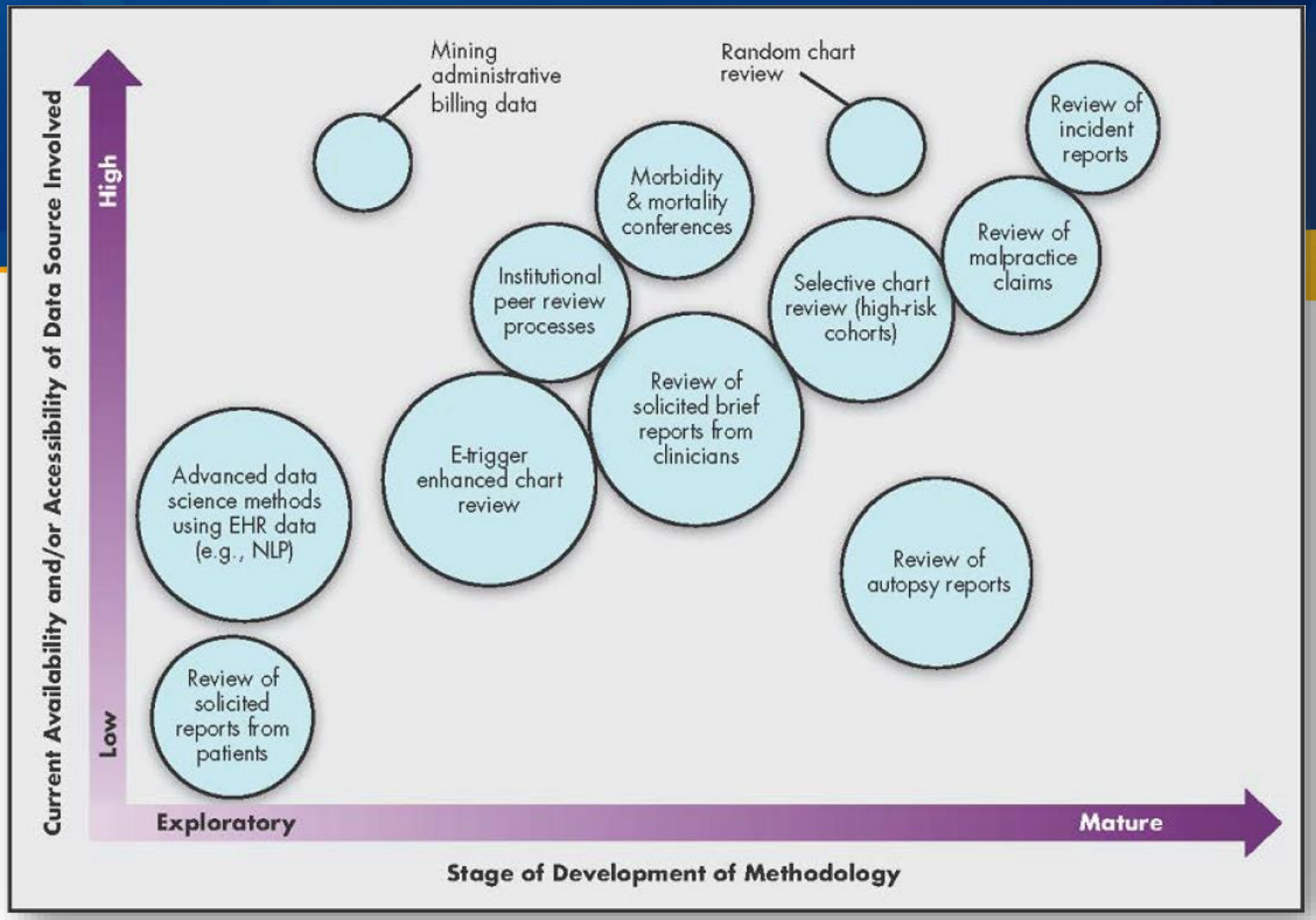


Croskerry P. *The Cognitive Autopsy*. Oxford: Oxford University Press; 2020, p. 87.

The goal of analysis is to understand and learn why what people did made sense to them at the time with the intent to improve the system (people, processes, policies, culture, infrastructure) in order to decrease the likelihood of errors.



Singh H, Bradford A, Goeschel C. Operational Measurement of Diagnostic Safety: State of the Science. Rockville, MD: Agency for Healthcare Research and Quality; April 2020. AHRQ Publication No. 20-0040-1-EF. https://www.ahrq.gov/patient-safety/reports/issue-briefs/state-of-science.html

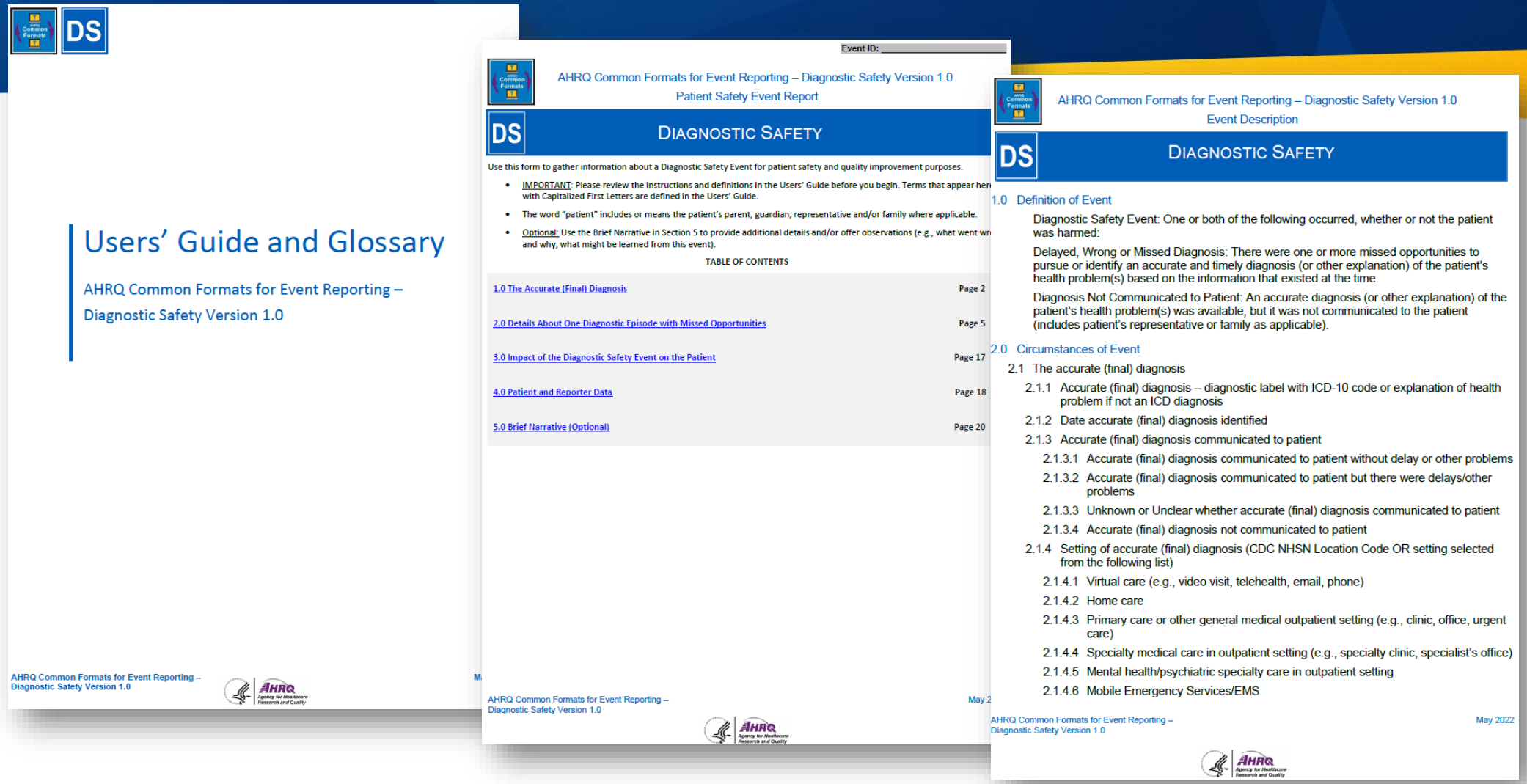


Singh H, Bradford A, Goeschel C. Operational Measurement of Diagnostic Safety: State of the Science. Rockville, MD: Agency for Healthcare Research and Quality; April 2020. AHRQ Publication No. 20-0040-1-EF. https://www.ahrq.gov/patient-safety/reports/issue-briefs/state-of-science.html

Table 3. Implementation Readiness of Diagnostic Safety Measurement Strategies and Estimated Yield Relative to Effort

Measurement Strategy	Stage of Development	Current Potential Availability and/or Accessibility of Data Source	Estimated Yield Relative to Effort
Review of solicited reports from patients	Exploratory	Low	Medium
Advanced data science methods using EHR data (e.g., NLP)	Exploratory	Low	Very large
Mining administrative billing data	Exploratory	High	Very small
E-trigger enhanced chart review	Moderate	Moderate	Very large
Institutional peer review processes	Moderate	High	Medium
Morbidity and mortality conferences	Moderate	High	Medium
Review of solicited brief reports from clinicians	Moderate	Moderate	Very large
Selective chart review of high-risk cohorts	Mature	High	Large
Random chart review	Mature	High	Very small
Review of autopsy reports	Mature	Low	Large
Review of malpractice claims	Mature	High	Medium
Review of incident reports	Mature	High	Small

Common Formats for Event Reporting - Diagnostic Safety Version 1.0



DS

Users' Guide and Glossary

AHRQ Common Formats for Event Reporting – Diagnostic Safety Version 1.0

AHRQ Common Formats for Event Reporting – Diagnostic Safety Version 1.0

Event ID: _____

AHRQ Common Formats for Event Reporting – Diagnostic Safety Version 1.0
Patient Safety Event Report

DS DIAGNOSTIC SAFETY

Use this form to gather information about a Diagnostic Safety Event for patient safety and quality improvement purposes.

- IMPORTANT: Please review the instructions and definitions in the Users' Guide before you begin. Terms that appear her with Capitalized First Letters are defined in the Users' Guide.
- The word "patient" includes or means the patient's parent, guardian, representative and/or family where applicable.
- Optional: Use the Brief Narrative in Section 5 to provide additional details and/or offer observations (e.g., what went wr and why, what might be learned from this event).

TABLE OF CONTENTS

AHRQ Common Formats for Event Reporting – Diagnostic Safety Version 1.0 May 2

AHRQ Common Formats for Event Reporting – Diagnostic Safety Version 1.0
Event Description

DS DIAGNOSTIC SAFETY

1.0 Definition of Event

Diagnostic Safety Event: One or both of the following occurred, whether or not the patient was harmed:

Delayed, Wrong or Missed Diagnosis: There were one or more missed opportunities to pursue or identify an accurate and timely diagnosis (or other explanation) of the patient's health problem(s) based on the information that existed at the time.

Diagnosis Not Communicated to Patient: An accurate diagnosis (or other explanation) of the patient's health problem(s) was available, but it was not communicated to the patient (includes patient's representative or family as applicable).

2.0 Circumstances of Event

2.1 The accurate (final) diagnosis

2.1.1 Accurate (final) diagnosis – diagnostic label with ICD-10 code or explanation of health problem if not an ICD diagnosis

2.1.2 Date accurate (final) diagnosis identified

2.1.3 Accurate (final) diagnosis communicated to patient

2.1.3.1 Accurate (final) diagnosis communicated to patient without delay or other problems

2.1.3.2 Accurate (final) diagnosis communicated to patient but there were delays/other problems

2.1.3.3 Unknown or Unclear whether accurate (final) diagnosis communicated to patient

2.1.3.4 Accurate (final) diagnosis not communicated to patient

2.1.4 Setting of accurate (final) diagnosis (CDC NHSN Location Code OR setting selected from the following list)

2.1.4.1 Virtual care (e.g., video visit, telehealth, email, phone)

2.1.4.2 Home care

2.1.4.3 Primary care or other general medical outpatient setting (e.g., clinic, office, urgent care)

2.1.4.4 Specialty medical care in outpatient setting (e.g., specialty clinic, specialist's office)

2.1.4.5 Mental health/psychiatric specialty care in outpatient setting

2.1.4.6 Mobile Emergency Services/EMS

AHRQ Common Formats for Event Reporting – Diagnostic Safety Version 1.0 May 2022

Available online at: https://www.psoppc.org/psoppc_web/publicpages/commonFormatsDSV1.0

Diagnostic Safety Event - Defined

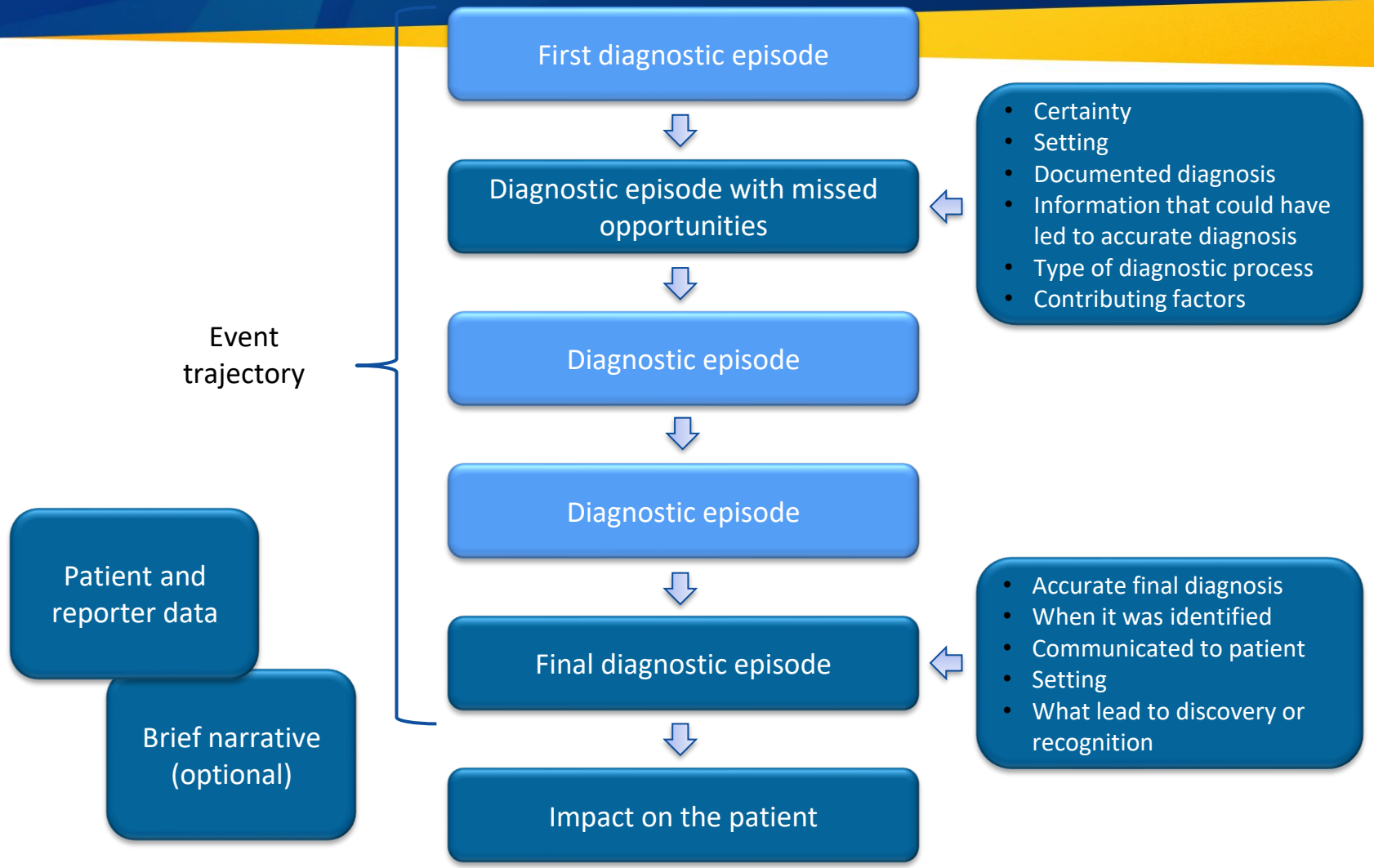
Diagnostic Safety Event: One or both of the following occurred, whether or not the patient was harmed:

DELAYED, WRONG OR MISSED DIAGNOSIS: There were one or more missed opportunities to pursue or identify an accurate and timely diagnosis (or other explanation) of the patient's health problem(s) based on the information that existed at the time.

DIAGNOSIS NOT COMMUNICATED TO PATIENT: An accurate diagnosis (or other explanation) of the patient's health problem(s) was available, but it was not communicated to the patient (includes patient's representative or family as applicable)

CFER-DS Conceptual Model

ATW HEALTH SOLUTIONS™



Learning Health System

- Have leaders who are committed to a culture of continuous learning and improvement.
- Systematically gather and apply evidence in real-time to guide care.
- Employ IT methods to share new evidence with clinicians to improve decision-making.
- Promote the inclusion of patients as vital members of the learning team.
- Capture and analyze data and care experiences to improve care.
- Continually assess outcomes refine processes and training to create a feedback cycle for learning and improvement.

About Learning Health Systems. Content last reviewed May 2019. Agency for Healthcare Research and Quality, Rockville, MD. Available online: https://www.ahrq.gov/learning-health-systems/about.html.

Create a feedback cycle for learning and improving diagnosis

ATW HEALTH SOLUTIONS™

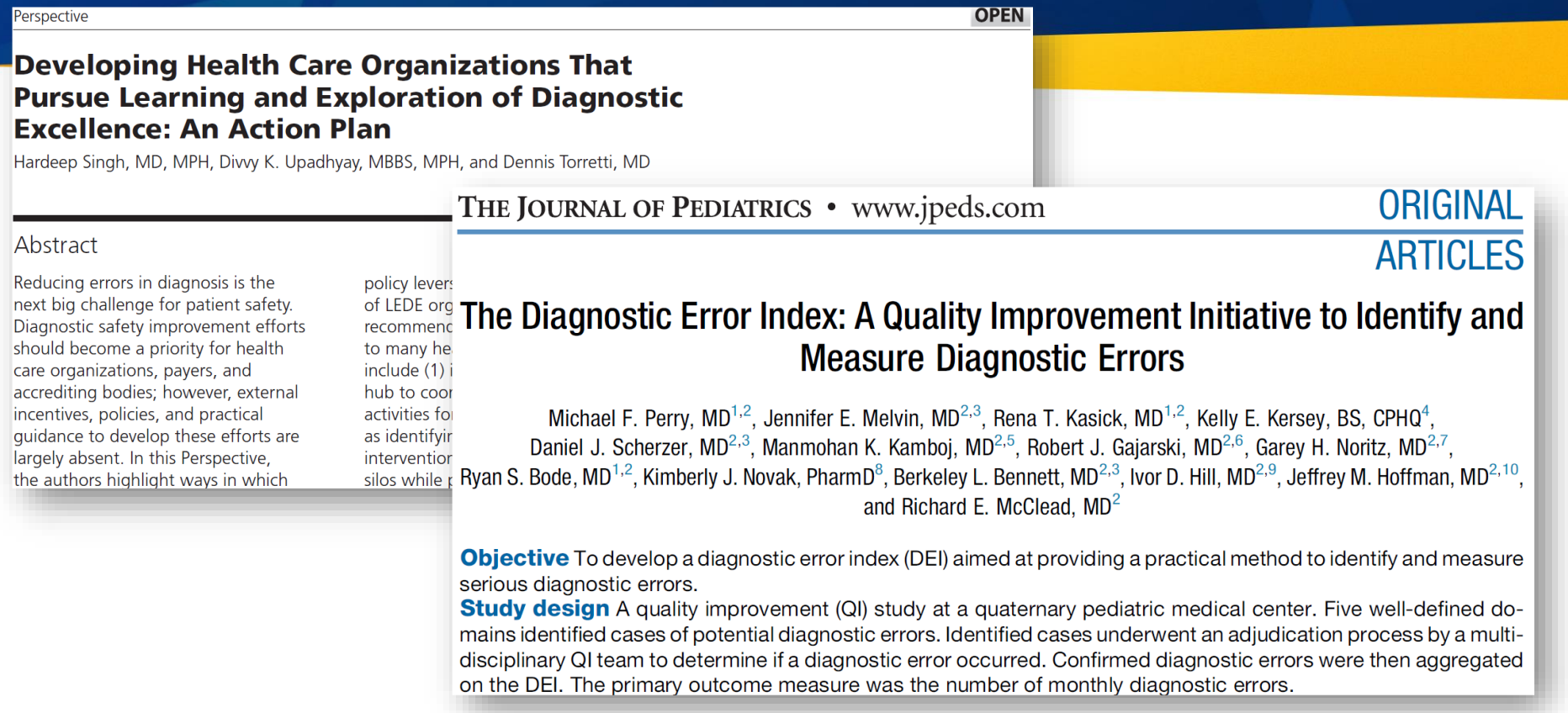
Providing feedback

- Replace the word error with “diagnostic learning” or “learning opportunity”
- Non-judgmental, non-punitive focus on improvement and coaching
- Identify champion at the department or unit level

Learn from others about new strategies and what works

Giardina TD, Shahid U, Mushtaq U, Upadhyay DK, Marinez A, Singh H. Creating a Learning Health System for Improving Diagnostic Safety: Pragmatic Insights from US Health Care Organizations. *J Gen Intern Med*. 2022;37(15):3965-3972. doi:10.1007/s11606-022-07554-w

Organizational approaches



Perspective

OPEN

Developing Health Care Organizations That Pursue Learning and Exploration of Diagnostic Excellence: An Action Plan

Hardeep Singh, MD, MPH, Divvy K. Upadhyay, MBBS, MPH, and Dennis Torretti, MD

Abstract

Reducing errors in diagnosis is the next big challenge for patient safety. Diagnostic safety improvement efforts should become a priority for health care organizations, payers, and accrediting bodies; however, external incentives, policies, and practical guidance to develop these efforts are largely absent. In this Perspective, the authors highlight ways in which

THE JOURNAL OF PEDIATRICS • www.jpeds.com

ORIGINAL ARTICLES

The Diagnostic Error Index: A Quality Improvement Initiative to Identify and Measure Diagnostic Errors

Michael F. Perry, MD[1,2], Jennifer E. Melvin, MD[2,3], Rena T. Kasick, MD[1,2], Kelly E. Kersey, BS, CPHQ[4], Daniel J. Scherzer, MD[2,3], Manmohan K. Kamboj, MD[2,5], Robert J. Gajarski, MD[2,6], Garey H. Noritz, MD[2,7], Ryan S. Bode, MD[1,2], Kimberly J. Novak, PharmD[8], Berkeley L. Bennett, MD[2,3], Ivor D. Hill, MD[2,9], Jeffrey M. Hoffman, MD[2,10], and Richard E. McClead, MD[2]

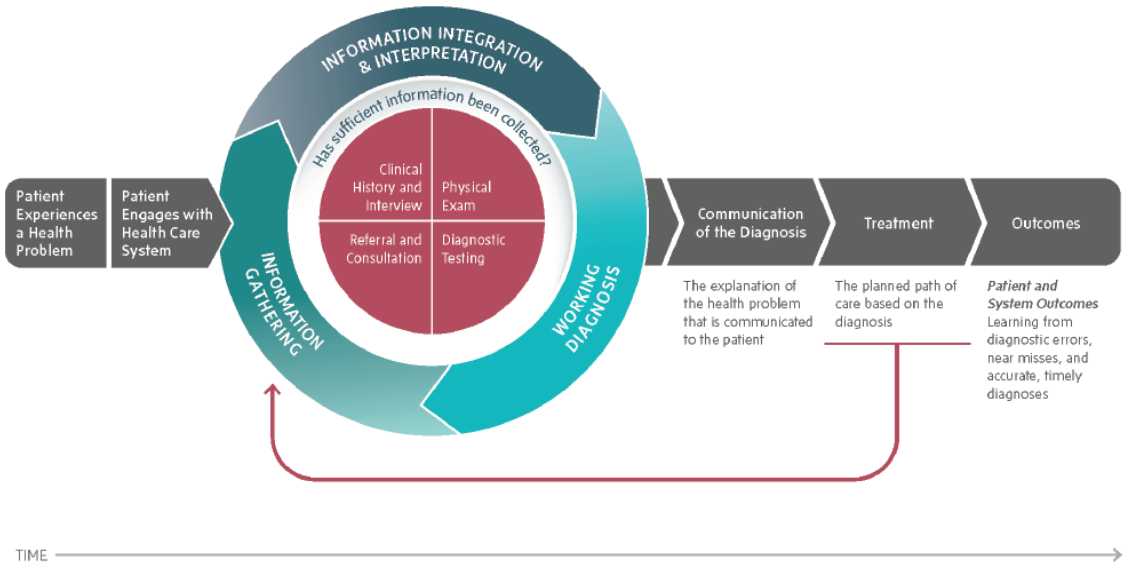
Objective To develop a diagnostic error index (DEI) aimed at providing a practical method to identify and measure serious diagnostic errors.

Study design A quality improvement (QI) study at a quaternary pediatric medical center. Five well-defined domains identified cases of potential diagnostic errors. Identified cases underwent an adjudication process by a multidisciplinary QI team to determine if a diagnostic error occurred. Confirmed diagnostic errors were then aggregated on the DEI. The primary outcome measure was the number of monthly diagnostic errors.

Singh H, Upadhyay DK, Torretti D. Developing Health Care Organizations That Pursue Learning and Exploration of Diagnostic Excellence: An Action Plan. *Acad Med*. 2020 Aug;95(8):1172-1178.

Perry MF, et al. The Diagnostic Error Index: A Quality Improvement Initiative to Identify and Measure Diagnostic Errors. *J Pediatr*. 2020 Dec 7:S0022-3476(20)31477-3.

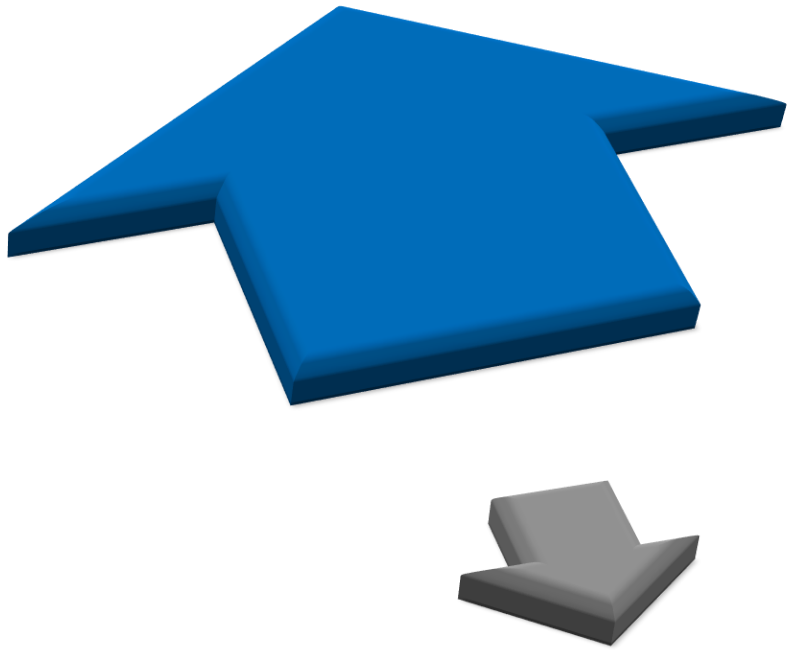
Interventions to Improve the Diagnostic Process



- Patient Communication
- Diagnostic Clinical Pathway
- Clinical Decision Support, Dashboards
- Communicating Diagnostic Uncertainty
- Facilitating Case Finding
- Clinician Feedback

Evolution of Safety

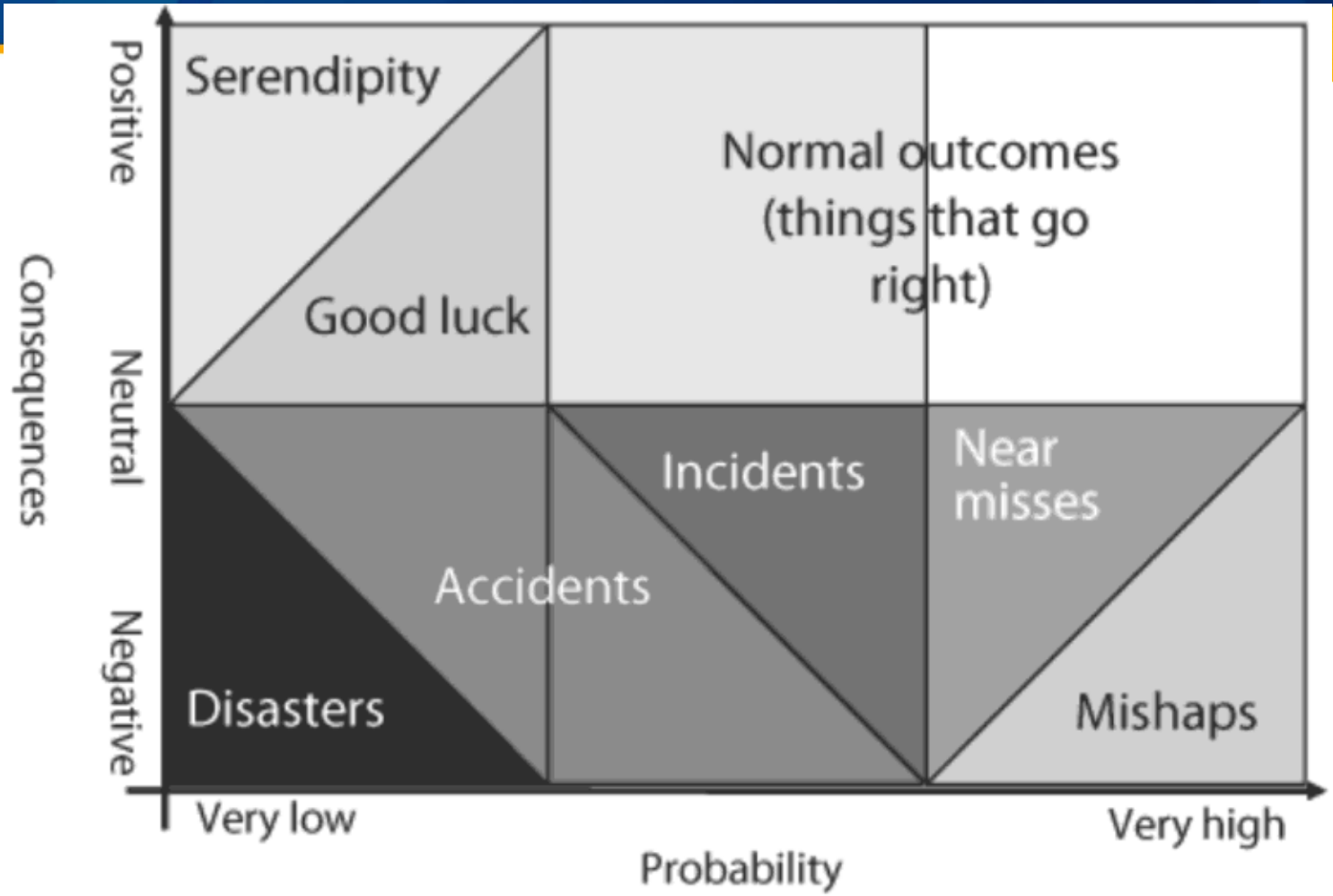
ATW HEALTH SOLUTIONS™



Things that go right

Things that go wrong

Resilience Engineering



Hollnagel E. Resilience Engineering in Practice: A Guidebook. New ed. Burlington, VT: Ashgate; 2011. p. xxxi.

"You cannot change the human condition. But you can change the conditions in which humans work."

James Reason, Professor of Psychology at the University of Manchester

Questions?

References

Holden RJ, Carayon P, Gurses AP, Hoonakker P, Hundt AS, Ozok AA, Rivera-Rodriguez AJ. SEIPS 2.0: a human factors framework for studying and improving the work of healthcare professionals and patients. *Ergonomics*. 2013;56(11):1669-86.

Frankel A, Haraden C, Federico F, Lenoci-Edwards J. A Framework for Safe, Reliable, and Effective Care. White Paper. Cambridge, MA: Institute for Healthcare Improvement and Safe & Reliable Healthcare; 2017.

Chassin MR, Loeb JM. The ongoing quality improvement journey: next stop, high reliability. *Health Aff (Millwood)*. 2011 Apr;30(4):559-68.

Chassin MR, Loeb JM. High-reliability health care: getting there from here. *Milbank Q*. 2013 Sep;91(3):459-90.

National Steering Committee for Patient Safety. Safer Together: A National Action Plan to Advance Patient Safety. Boston, Massachusetts: Institute for Healthcare Improvement; 2020. Available at www.ihi.org/SafetyActionPlan.

Battles JB, Kaplan HS, Van der Schaaf TW, Shea CE. The attributes of medical event-reporting systems: experience with a prototype medical event-reporting system for transfusion medicine. *Arch Pathol Lab Med*. 1998 Mar;122(3):231-8.

Thomas EJ, Petersen LA. Measuring errors and adverse events in health care. *J Gen Intern Med*. 2003 Jan;18(1):61-7.

NPSF. RCA2: Improving Root Cause Analyses and Actions to Prevent Harm. 2016. http://www.ihi.org/resources/Pages/Tools/RCA2-Improving-Root-Cause-Analyses-and-Actions-to-Prevent-Harm.aspx

B&W Technical Services Pantex. Causal Factors Analysis: An Approach for Organizational Learning. Amarillo, TX: B&W Pantex; 2008. p. 71.

National Academies of Sciences, Engineering, and Medicine. *Improving diagnosis in health care*. Washington, DC: The National Academies Press; 2015.

The Joint Commission. Sentinel Event Data Summary. 2024. https://www.jointcommission.org/resources/patient-safety-topics/sentinel-event/sentinel-event-data-event-type-by-year/

Croskerry P. *The Cognitive Autopsy*. Oxford: Oxford University Press; 2020, p. 87.

Singh H, Bradford A, Goeschel C. Operational Measurement of Diagnostic Safety: State of the Science. Rockville, MD: Agency for Healthcare Research and Quality; April 2020. AHRQ Publication No. 20-0040-1-EF. https://www.ahrq.gov/patient-safety/reports/issue-briefs/state-of-science.html

Common Formats for Event Reporting - Diagnostic Safety Version 1.0. Agency for Healthcare Research and Quality, Rockville, MD. https://www.psoppc.org/psoppc_web/publicpages/commonFormatsDSV1.0

About Learning Health Systems. Content last reviewed May 2019. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/learning-health-systems/about.html

Giardina TD, Shahid U, Mushtaq U, Upadhyay DK, Marinez A, Singh H. Creating a Learning Health System for Improving Diagnostic Safety: Pragmatic Insights from US Health Care Organizations. *J Gen Intern Med*. 2022;37(15):3965-3972. doi:10.1007/s11606-022-07554-w

Singh H, Upadhyay DK, Torretti D. Developing Health Care Organizations That Pursue Learning and Exploration of Diagnostic Excellence: An Action Plan. *Acad Med*. 2020 Aug;95(8):1172-1178.

Perry MF, et al. The Diagnostic Error Index: A Quality Improvement Initiative to Identify and Measure Diagnostic Errors. *J Pediatr*. 2020 Dec 7:S0022-3476(20)31477-3.

Hollnagel E. Resilience Engineering in Practice: A Guidebook. New ed. Burlington, VT: Ashgate; 2011. p. xxxi