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1. Introduction to Patient Safety & Medication Errors

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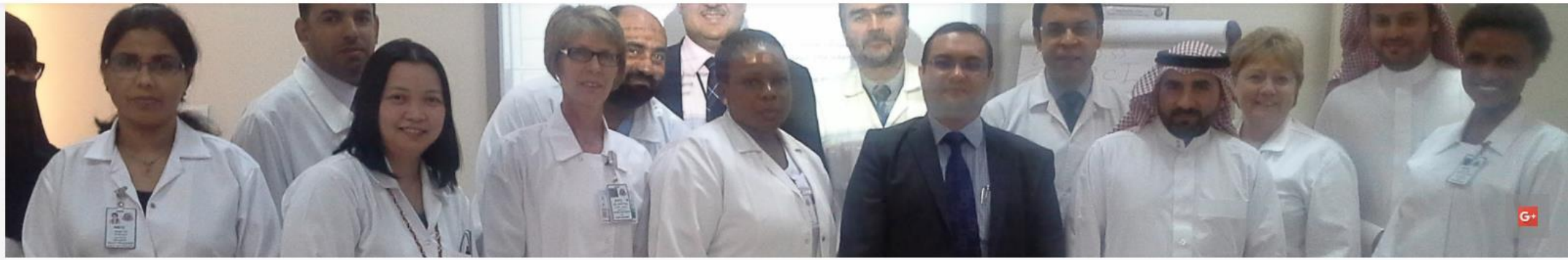

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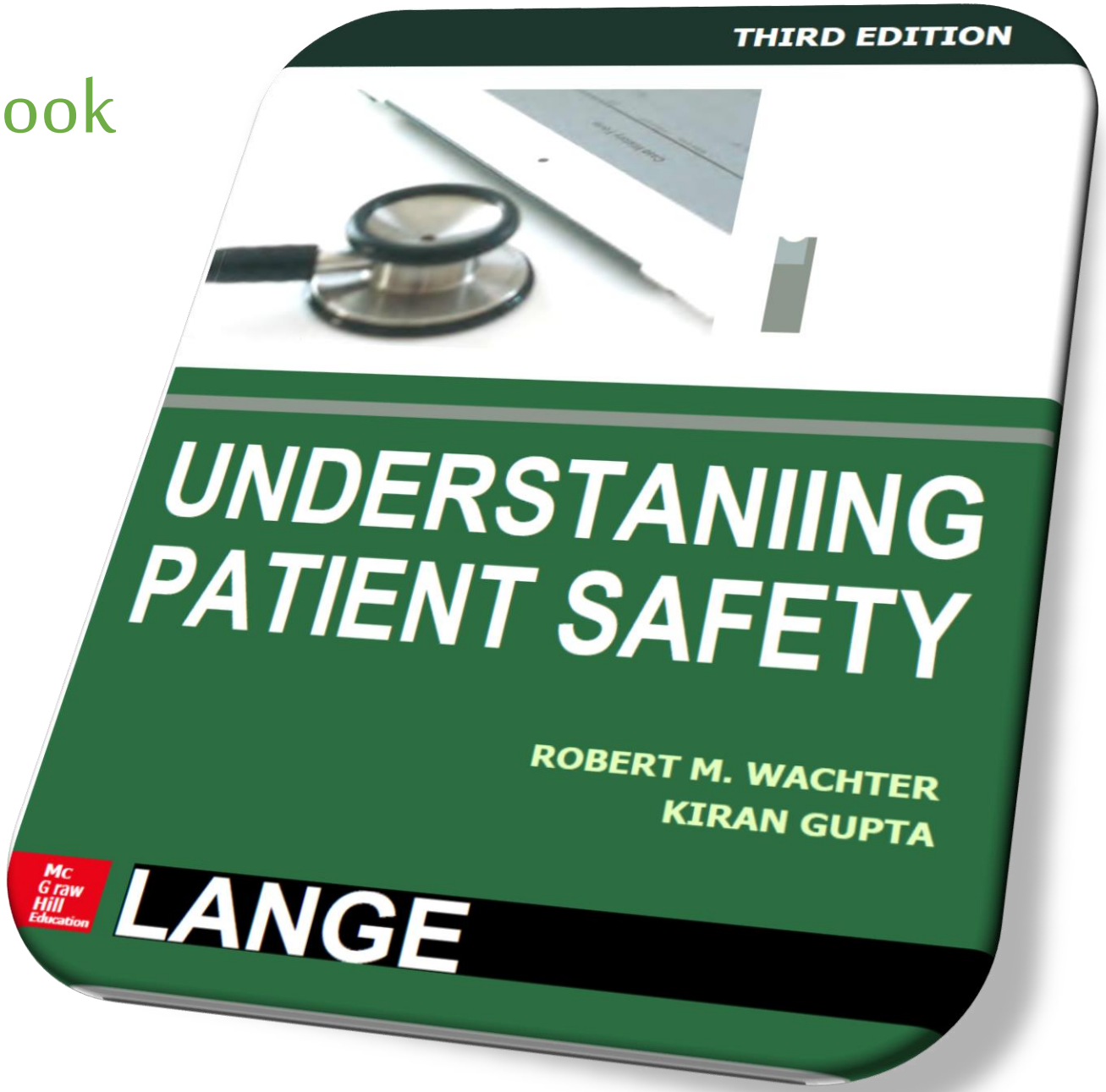

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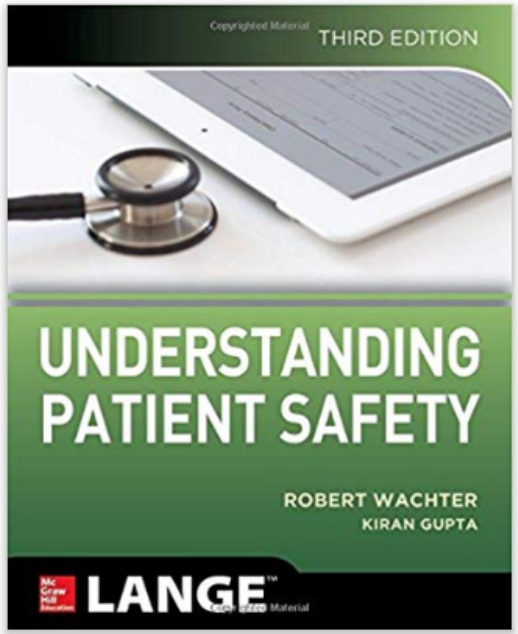

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Patient Safety Primers

Guides for key topics in patient safety through context, epidemiology, and relevant AHRQ PSNet content. The Patient Safety 101 Primer provides an overview of the patient safety field and covers key definitions and concepts.

NARROW RESULTS Clear All

Approach to Improving Safety

- Communication Improvement 7
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PATIENT SAFETY PRIMERS

Adverse Events, Near Misses, and Errors

The terms adverse events, near misses, and medical errors are used in patient safety to refer to events where patients were harmed (or easily could have been).

PATIENT SAFETY PRIMERS

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CPPS Course Study Scheme

The Book: Understanding Patient Safety, Wachter and Gupta, Third edition

Session No.	Relevant Chapters	Session No.	Relevant Chapters
1	1-2	9	13-14
2	3-4	10	15
3	5	11	16
4	6-7	12	17-18
5	8	13	19
6	9-10	14	20-21-22
7	11-12	15	Review – Practice Questions
8	13	16	Exam Questions

3 Friends .. 3 Websites

Secure | https://www.ahrq.gov

National Scorecard on Hospital-Acquired Conditions

Declines in HACs save 8,000 lives and $2.9 billion in costs

Patient Safety and Quality Improvement

Making Care Safer in All Settings

Opioids

Supporting HHS' Opioid Initiative

Patient-Centered Outcomes Research

Translating evidence into practice to improve patient outcomes

WHAT WE DO

AHRQ invests in research and evidence to make health care safer and improve quality.

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AHRQ generates measures and data used to track and improve performance and evaluate progress of the U.S. Health system.

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Patient safety

Patient safety
Policies and strategies
Medication Without Harm
Education and training
Technical topics
Patient engagement
Networks and partnerships
Publications

Medication Without Harm

The *WHO's Global Patient Safety Challenge: Medication Without Harm* brochure has been released, outlining the vision and strategic direction of this global initiative aiming to reduce the level of severe, avoidable harm related to medications by 50% over the next five years, globally. It provides an overview of the key components of the Challenge including the local, national and global action to be taken.

– Download the brochure: *Medication Without Harm*

Magnitude

1 in 10

As many as 1 in 10 patients are harmed whilst receiving health care

Evidence of unsafe care

Incidence

43 million

Approximately 43 million patient safety incidences occur every year

The global burden of unsafe medical care

Medications

$42 billion

Medication errors cost an estimated 42 billion USD annually

Medication Without Harm: WHO's Third Global Patient Safety Challenge

Like the Book’s Title: It is all about:

Understanding

Let's Get Started ☺

- **Today:**

1- Preface

2- Chapter 1: The nature and frequency of medical errors and adverse events

3- Chapter 2: Basic principles of patient safety

4- Appendix V: AHRQ – Patient Safety Indicators (PSIs)

Not secure | www.who.int/features/factfiles/patient_safety/en/

10 facts on patient safety

Updated March 2018

Patient safety is a serious global public health concern. There is a 1 in a million chance of a person being harmed while travelling by plane. In comparison, there is a 1 in 300 chance of a patient being harmed during health care. Industries with a perceived higher risk such as the aviation and nuclear industries have a much better safety record than health care.

1 / 10

WHO/G. Reboux

Fact 1: Patient harm is the 14th leading cause of the global disease burden, comparable to diseases such as tuberculosis and malaria

It is estimated that there are 421 million hospitalizations in the world annually, and approximately 42.7 million adverse events occur in patients during these hospitalizations. Using conservative estimates, the latest data shows that patient harm is the 14th leading cause of morbidity and mortality across the world.

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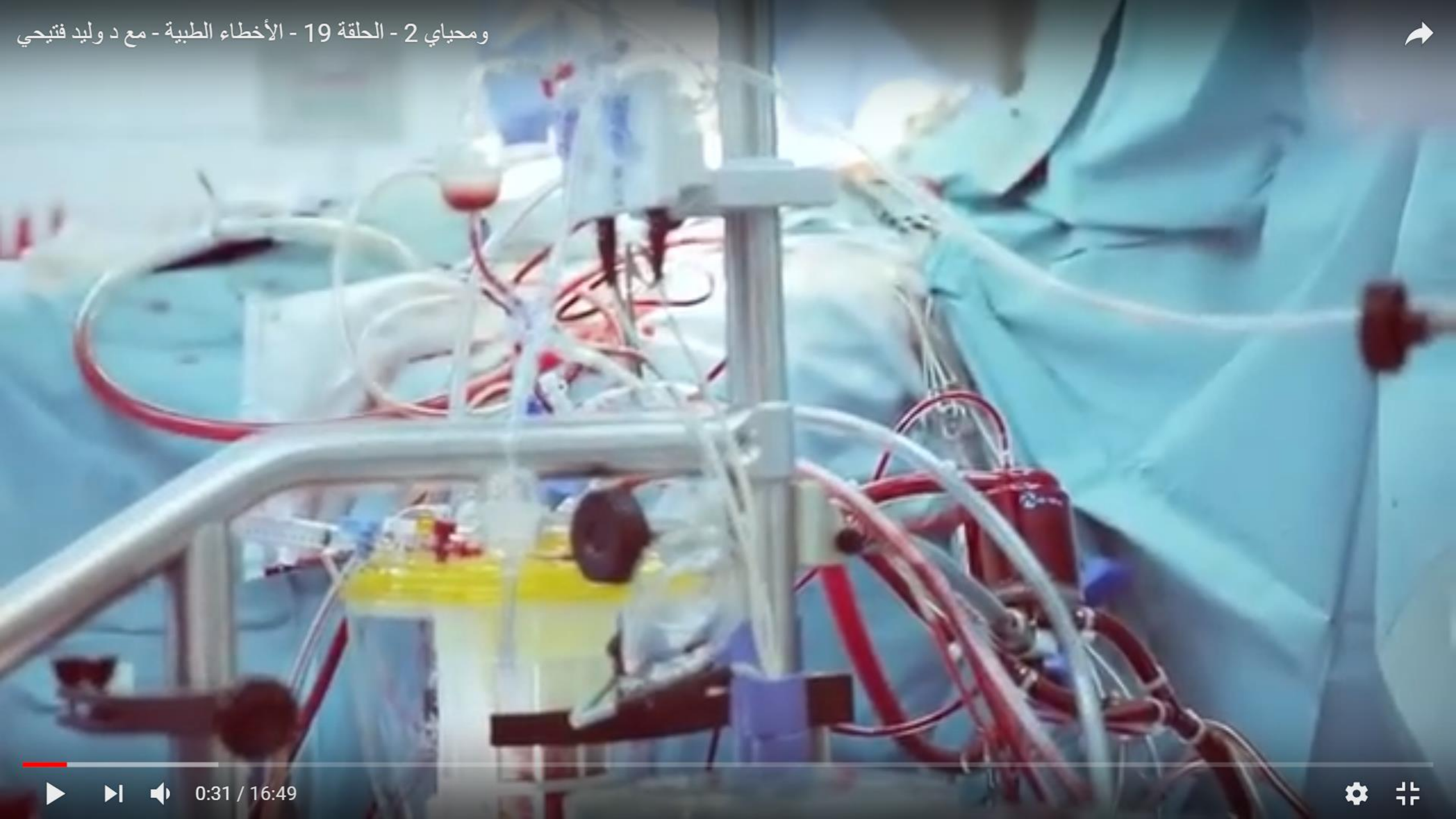
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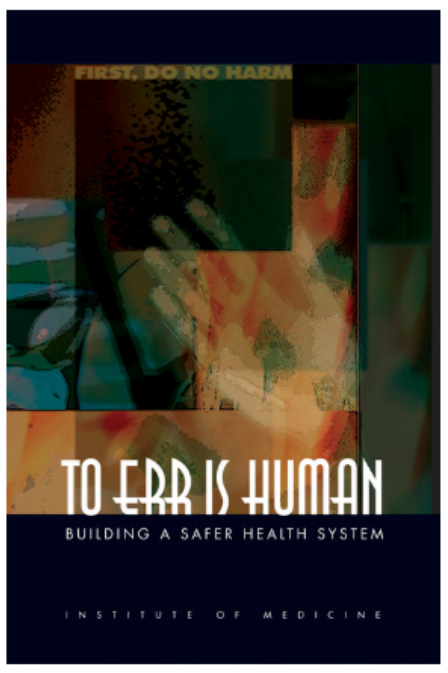

To Err Is Human

Building a Safer Health System (2000)

Consensus Study Report

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Bloody Shock

44000 – 98000 Preventable death per year in US hospitals, 1999.

1.Tangible.

2.Could fly?

3.How to fix?

Who in the medical team wakes up to kill somebody in the hospital?

Second Victim

- Dr. Albert Wu

We in Healthcare need to learn from:

- Aviation
- Manufacturing
- Education
- Engineering
- Sociology
- Psychology
- Management

- What else?

Table P-1 **EXAMPLES OF PATIENT SAFETY PRACTICES DRAWN AT LEAST IN PART FROM NONHEALTHCARE INDUSTRIES**

Strategy	Nonhealthcare Example	Study Demonstrating Value in Healthcare	Impetus for Wider Implementation in Healthcare
Improved ratios of providers to "customers" (Chapter 16)	Teacher-to-student ratios (such as in class-size initiatives)	Needleman et al. (2011)	Legislation in many states mandating minimum nurse-to-patient ratios, other pressure
Decrease provider fatigue (Chapter 16)	Consecutive work-hour limitations for pilots, truck drivers	Landrigan et al. (2004)	Accreditation Council for Graduate Medical Education (ACGME) regulations limiting resident duty hours
Improve teamwork and communication (Chapter 15)	Crew resource management (CRM) in aviation	Neily et al. (2010)	Some hospitals now requiring team training for individuals who work in risky areas such as labor and delivery or surgery
Use of simulators (Chapter 17)	Simulator use in aviation and the military	Bruppacher et al. (2010)	Medical simulation now required for credentialing for certain procedures; technology improving and costs falling
Executive Walk Rounds (Chapter 22)	"Management by Walking Around" in business	Thomas et al. (2005)	Executive Walk Rounds not required, but remain a popular practice
Bar coding (Chapter 13)	Use of bar coding in manufacturing, retail, and food sales	Poon et al. (2010)	U.S. Food and Drug Administration now requires bar codes on most prescription medications; bar coding or its equivalent may ultimately be required in many identification processes

- In 2018:
- 90 % of hospitals use EHR in USA.
- 70% of physician offices.

- In 2008, was 10% for each.

Patient Safety: Anticipate the unanticipated

Patient Safety Officers

ABC Definitions

Definition

- Error (Mistake): BROAD TERM

- An act of commission or omission leading to an undesirable outcome or significant potential for such an outcome.

- Many errors don’t result in adverse events.

- Commission: doing something wrong.
- Omission: failing to do the right thing.

Definitions

- Adverse event (Harm):

Unintended physical injury resulting from or contributed to by medical care (including the absence of indicated medical treatment) that requires additional monitoring, treatment, or hospitalization, or that results in death.

- *Preventable*
- *Non preventable: (e.g. due to the underlying medical condition)*
- *Ameliorable: non preventable yet could have been mitigated.*
- *Negligence: care falls below the professional standard of care.*

Definitions

- **Harm without any error (Error-Free Harm):**

- Accepted complications of surgery.
- Medication side effect.
- Etc.

Definitions

- **Near Miss:**

(Close Call / Good Catch/ Potential Adverse Event/ More serious error)

- A near miss is defined as "any event that could have had adverse consequences but did not and was indistinguishable from fully fledged adverse events in all but outcome.“

- https://psnet.ahrq.gov/primers/primer/34/adverse-events-near-misses-and-errors

Definitions

- **Near miss:**
- An unplanned event that did not result in injury, illness or damage – but had the potential to do so.
- *Source: Fact sheet from OSHA and the National Safety Council*

Definitions

- **Near Miss**
- WHO defines a near miss as “an error that has the potential to cause an adverse event (patient harm) but fails to do so because of chance or because it is intercepted”

- According to the Institute of Medicine, a near miss is “an act of commission or omission that could have harmed the patient but did not cause harm as a result of chance, prevention, or mitigation”

- I have reviewed more than 20 definitions; there is a general consensus that this concept should be used for indicating a type of incident that has the potential to result in harm but finally fails to cause harm”. (Abbas SHEIKHTAHERI, 2014)

- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4475608/
- Near Misses and Their Importance for Improving Patient Safety

(Abbas SHEIKHTAHERI, 2014)

- **A. Near misses**
- Type 1: An incident that does not reach to the patient because of formal and planned interventions and programs (previously developed by the organization)
- Type 2: An incident that does not reach to the patient because of chance or unplanned interventions
- **B. No harm incidents**
- Type 3: An incident that does reach to the patient but does not cause harm because of early detection, interventions and treatment
- Type 4: An incident that does reach to the patient but does not cause harm because of chance

Definitions

- **Near Miss of a Sentinel Event (Risk Thereof):**

- Coming….

Value of Near Misses

Definitions: Slip Vs. Mistake

- **Slip: automatic behavior انزلاق عن غير قصد**

Slips are inadvertent, unconscious lapses in the performance of some automatic tasks.

- **Mistake: conscious behavior (Paying attention during the act)غلطة / خطأ**

Mistakes result from incorrect choices.

Usually due to insufficient knowledge, lack of experience or training, inadequate information, applying the wrong set of rules or algorithms to decisions, etc.

Definitions

- Sentinel Event:

Definitions

- **Sentinel Event:**
- A sentinel event is a Patient Safety Event that reaches a patient and results in any of the following:
- Death
- Permanent harm
- Severe temporary harm and intervention required to sustain life

- https://www.jointcommission.org/sentinel_event_policy_and_procedures/

Definitions

- **Sentinel Event:**
- A sentinel event is an unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of limb or function.
- The phrase “or the risk thereof” includes any process variation for which a recurrence would carry a significant chance of a serious adverse outcome.
- Such events are called “sentinel” because they signal the need for immediate investigation and response. n The terms “sentinel event” and “error” are not synonymous; not all sentinel events occur because of an error, and not all errors result in sentinel events

- https://www.jointcommission.org/assets/1/6/CAMH_2012_Update2_24_SE.pdf

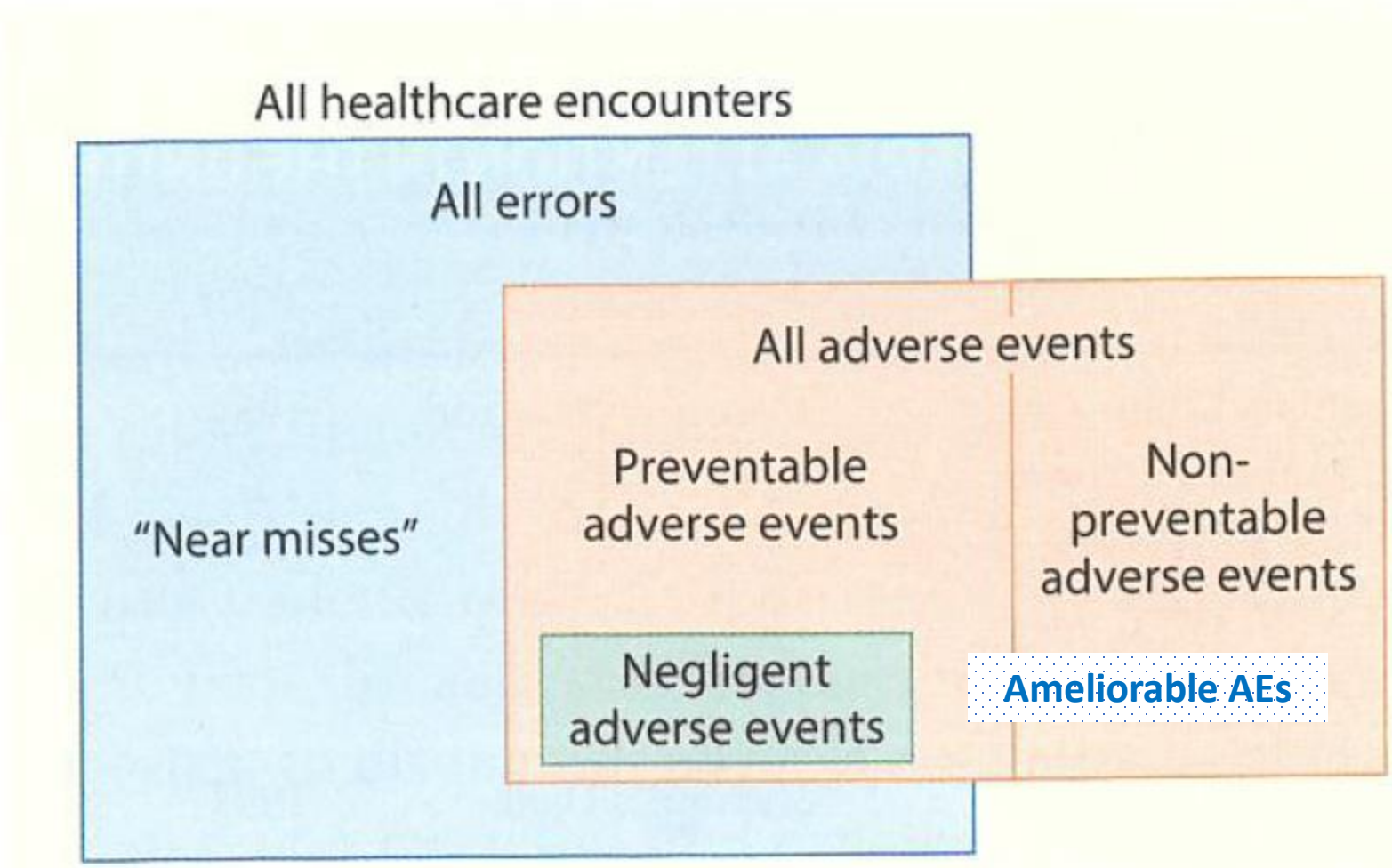
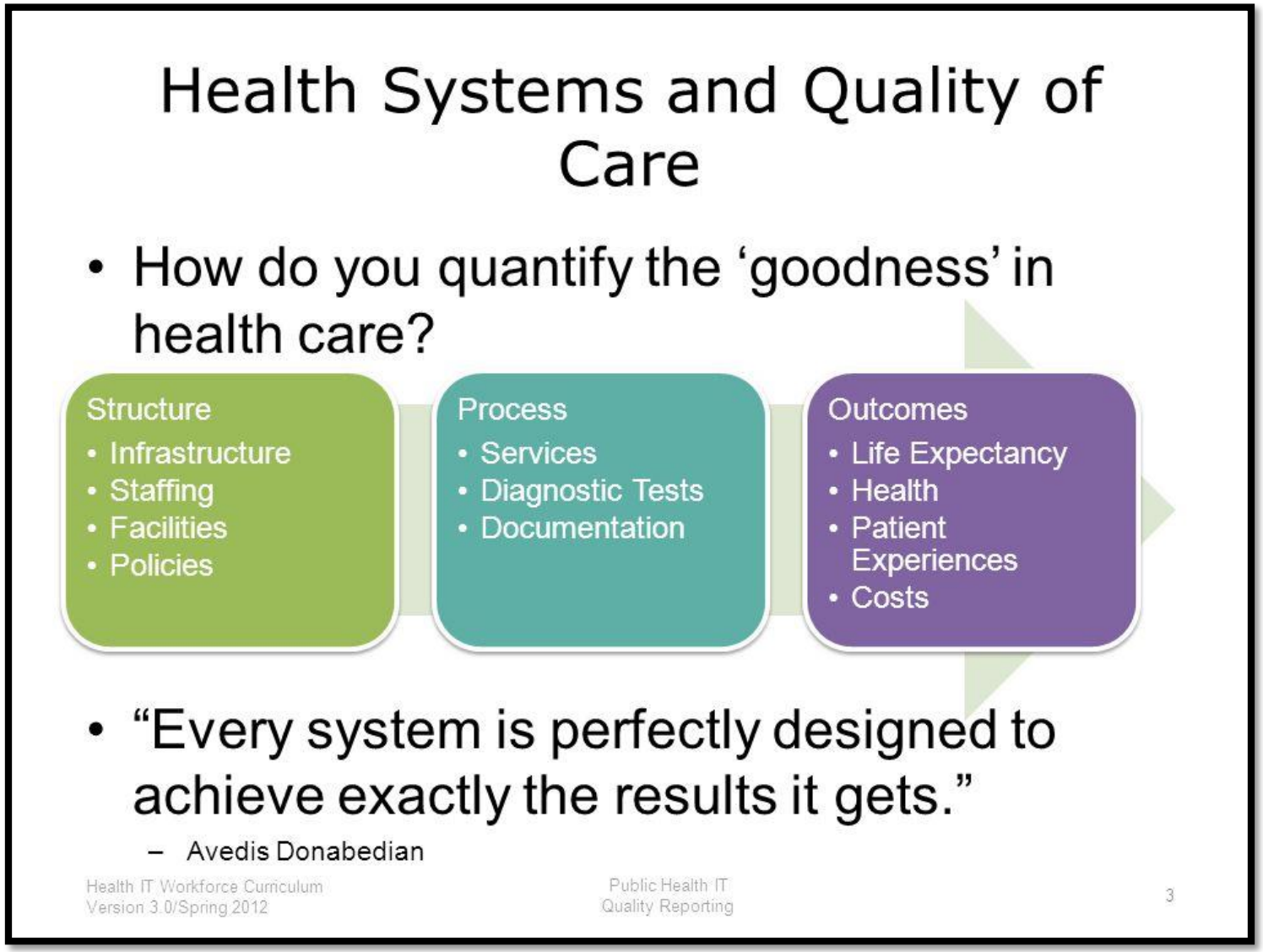


Figure 1-1 ▪ Venn diagram depicting patient safety terminology.

Definitions:

- Donabedian Triad:
- Classify the measures, adverse events, etc.



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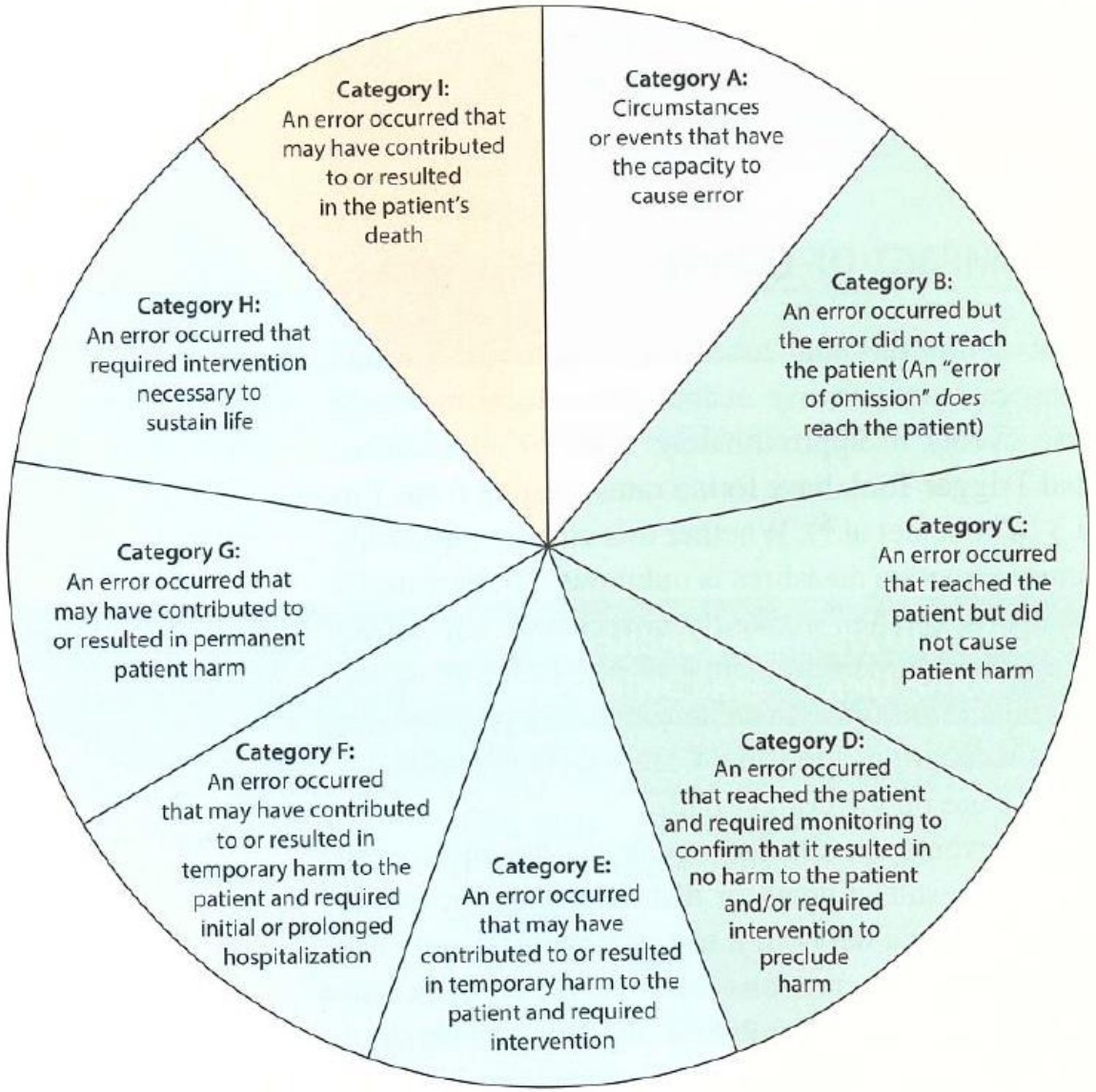


Near Miss

Adverse Event

Sentinel Event

Figure 1-2 ▪ The NCC MERP Index for categorizing [illegible] th permission from the National Coordinating Council for Medication Error Reporting and Prevention, © 2[illegible]/www.nccmerp.org/sites/default/files/indexColor2001-06-12.pdf.)

Table 1-1 SELECTED MEDICAL ERRORS THAT GARNERED EXTENSIVE MEDIA ATTENTION IN THE UNITED STATES*

Error	Institution	Year	Impact
An I 8-year-old woman, Libby Zion, daughter of a prominent reporter, dies of a medical mistake, partly due to lax resident supervision	Cornell's New York Hospital	1984	Public discussion regarding resident training, supervision, and work hours. Led to New York law regarding supervision and work hours, ultimately culminating in ACGME duty hour regulations (Chapter 16)
Betsy Lehman, a *Boston Globe* healthcare reporter, dies of a chemotherapy overdose	Harvard's Dana-Farber Cancer Institute	1994	New focus on medication errors, role of ambiguity in prescriptions, and possible role of computerized prescribing and decision support (Chapters 4 and 13)
Willie King, a 51-year-old diabetic, has the wrong leg amputated	University Community Hospital, Tampa, Florida	1995	New focus on wrong-site surgery, ultimately leading to Joint Commission's Universal Protocol, and later the surgical checklist, to prevent these errors (Chapter 5)
18-month-old Josie King dies of dehydration	Johns Hopkins Hospital	2001	Josie's parents form an alliance with Johns Hopkins' leadership (leading to the Josie King Foundation and catalyzing Hopkins' safety initiatives), demonstrating the power of institutional and patient collaboration

Jesica Santillan, a 17-year-old girl from Mexico, dies after receiving a heart—lung transplant of the wrong blood type	Duke University Medical Center	2003	New focus on errors in transplantation, and on enforcing strict, high reliability protocols for communication of crucial data (Chapters 2 and 8)
The twin newborns of actor Dennis Quaid are nearly killed by a large heparin overdose	Cedars-Sinai Medical Center	2007	Renewed focus on medication errors and the potential value of bar coding to prevent prescribing errors (Chapters 4 and 13)
Rory Staunton, a 12-year-old boy, is readmitted and ultimately dies of septic shock after initially being sent home from the emergency department	New York University Langone Medical Center	2012	Emphasis on early detection and treatment of sepsis
Joan Rivers, a famous comedian, suffers cardiac arrest while undergoing laryngoscopy and endoscopy under sedation at an ambulatory center; she dies a week later	Yorkville Endoscopy LLC	2014	Raises concerns regarding the safety of performing certain procedures in the ambulatory setting as well as the need to appropriately consent patients for procedures

How to measure errors and safety

- Incident Repoting (OVR, OVA, SRS, etc.)
- AHRQ: Patient Safety Indicators (PSIs)
- IHI Global Trigger Tool
- Chart Review: Concurrent – Retrospective (labor and resource intensive)
- Automated Surveillance: screening high risk patients
- Administrative / claims data
- Hospital Standardized Mortality Ratios (HSMR): Professor Brian Jarman, Imperial College London, UK: heavily criticized due to lack of appropriate both risk adjustment and consistency in measuring.
- ***Recent Trend: Ask Patients themselves to identify instances of harm and errors.***

Table 1-2 **SELECTED TRIGGERS FROM THE INSTITUTE FOR HEALTHCARE IMPROVEMENT'S (IHI) GLOBAL TRIGGER TOOL**

Care module triggers

Any code or arrest
Abrupt drop of >25% in haematocrit
Patient fall
Readmission within 30 days
Transfer to higher level of care

Surgical module triggers

Return to surgery
Intubation/reintubation in postanesthesia care unit
Into- or postoperative death
Postoperative troponin level >1.5 ng/mL

Medication module triggers

PTT >100 s
INR >6
Rising BUN or creatinine >2 times baseline
Vitamin K administration
Narcan (Naloxone) use
Abrupt medication stop

Intensive care module triggers

Pneumonia onset
Readmission to intensive care
Intubation/reintubation

Perinatal module

Third- or fourth-degree lacerations

ED module

Readmission to **ED** within 48 h
Time in **ED >6 h**

Table 1-4 ADVANTAGES AND DISADVANTAGES OF VARIOUS STRATEGIES FOR MEASURING SAFETY AND HARM

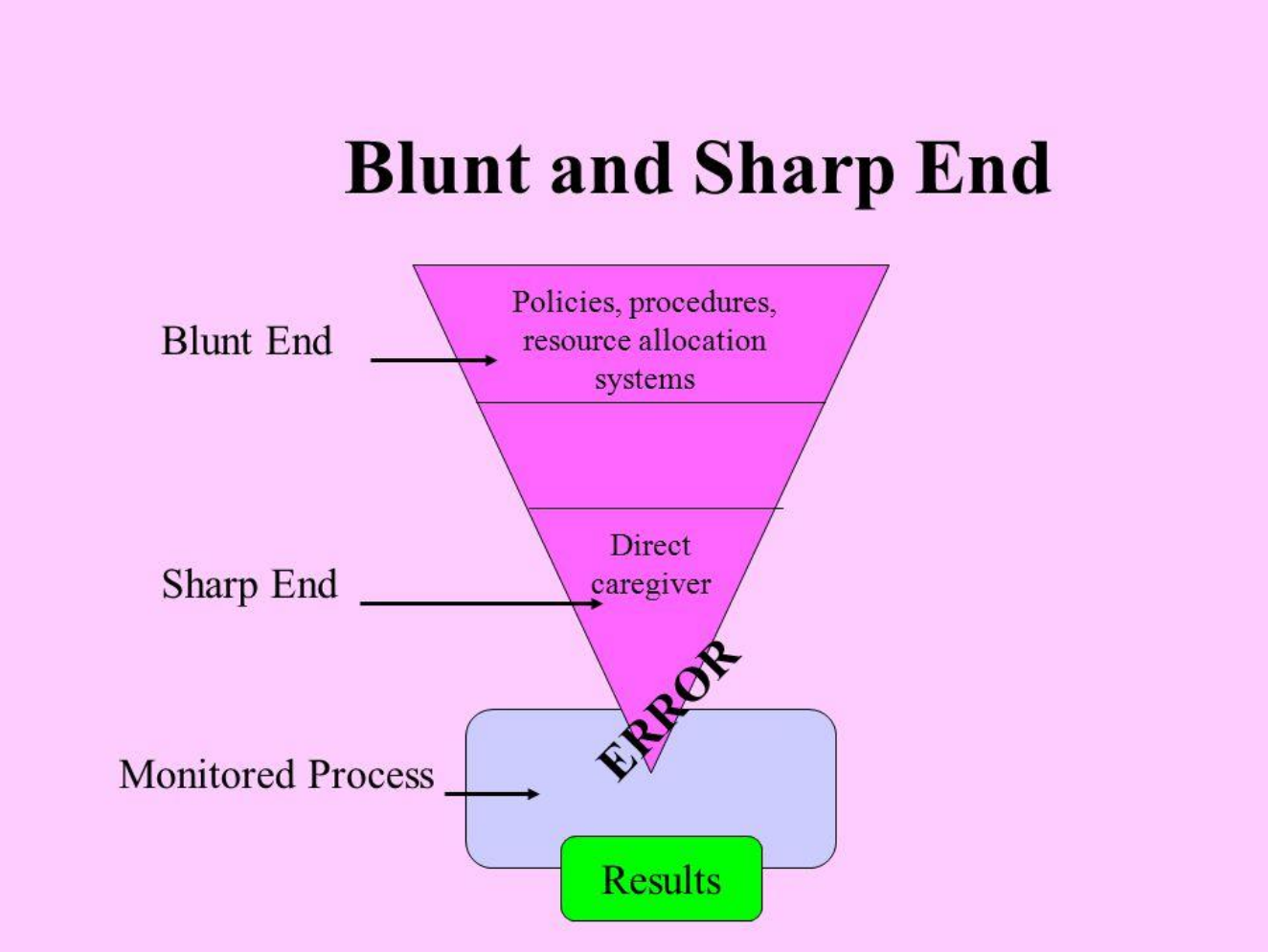
Measurement Strategies	Advantages	Disadvantages
Retrospective Chart Review (by itself or after use of a trigger tool)	Considered the "gold standard," contains rich detailed clinical information	Costly, labor-intensive, data quality variable due to incomplete clinical information, retrospective review only. Efficiency improved by focusing chart reviews on cases identified by a reliable trigger tool
Voluntary Incident Reporting Systems	Useful for internal quality improvement and case-finding, highlights adverse events that providers perceive as important	Capture small fraction of adverse events, retrospective review only based on provider self-reports, no standardization or uniformity of adverse events reported
Automated Surveillance	Can be used retrospectively or prospectively, helpful in screening patients who may be at high risk for adverse events using standardized protocols	Need electronic data to run automated surveillance, high proportion of "triggered" cases are false positives
Administrative/Claims Data (e.g., AHRQ Patient Safety Indicators)	Low-cost, readily available data, useful for tracking events over time across large populations, can identify "potential" adverse events	Lack detailed clinical data, concerns over variability and inaccuracy of *LCD-9-CM* codes across and within systems, may detect high proportion of false positives

Challenges of measuring errors and safety

- public health researchers have established that only 10 to 20 percent of errors are ever reported and, of those, 90 to 95 percent cause no harm to patients. Hospitals need a more effective way to identify events that do cause harm to patients, in order to select and test changes to reduce harm

- http://www.ihi.org/resources/Pages/Tools/IHIGlobalTriggerToolforMeasuringAEs.aspx

Sharp End – Blunt End in Errors



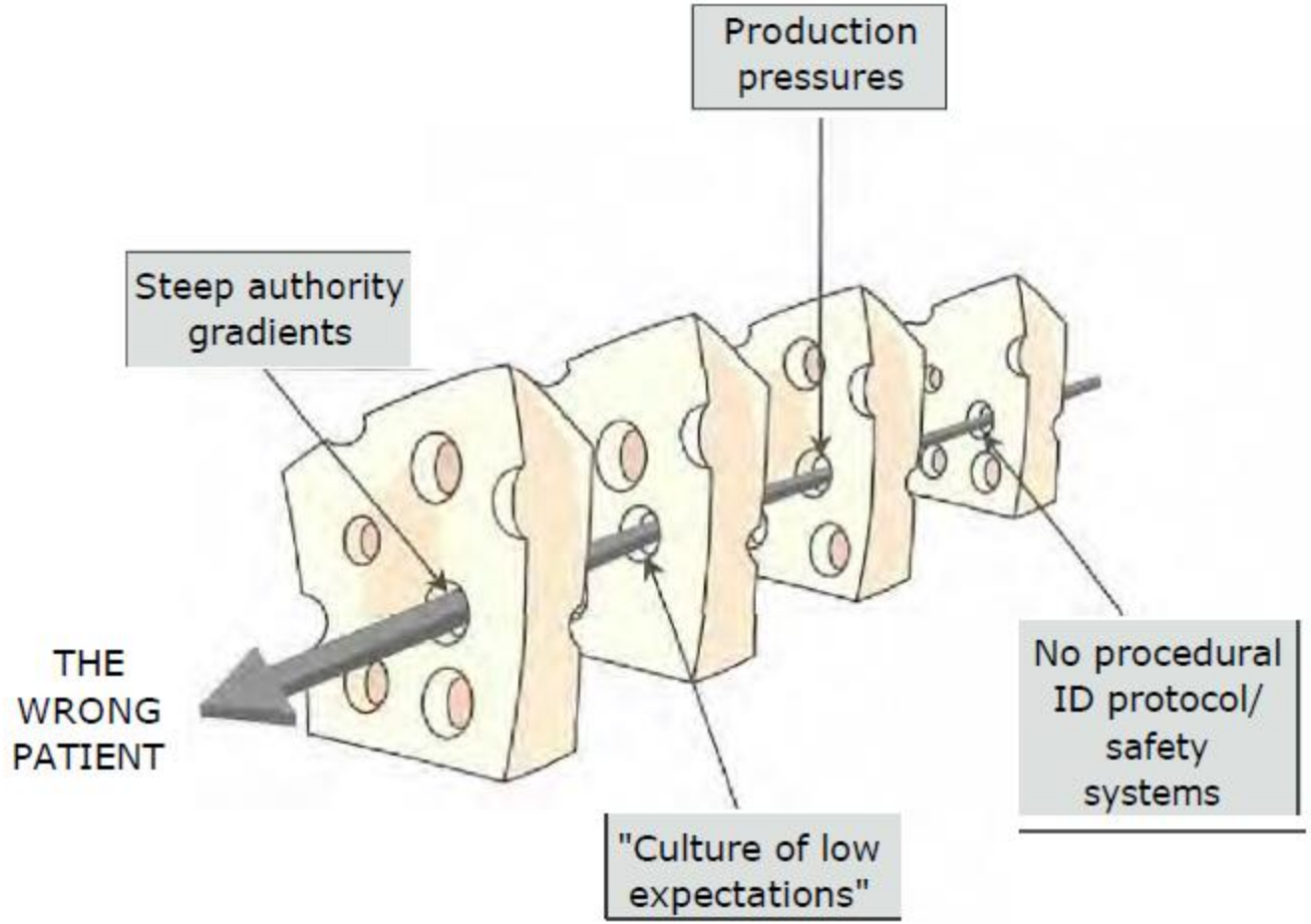


Figure 2-1 [2] James Reason's Swiss cheese model of organizational accidents. The analysis is of "The Wrong Patient"case in Chapter 15. (Reproduced with permission from Reason JT. *Human Error.* New York, NY: Cambridge University Press; 1990. Copyright © 1990 Cambridge University Press.)

Complexity of Healthcare system

- Simple system
- Compound system
- Complex system (complex adaptive system - CAS)

High Reliability Organization (HRO)

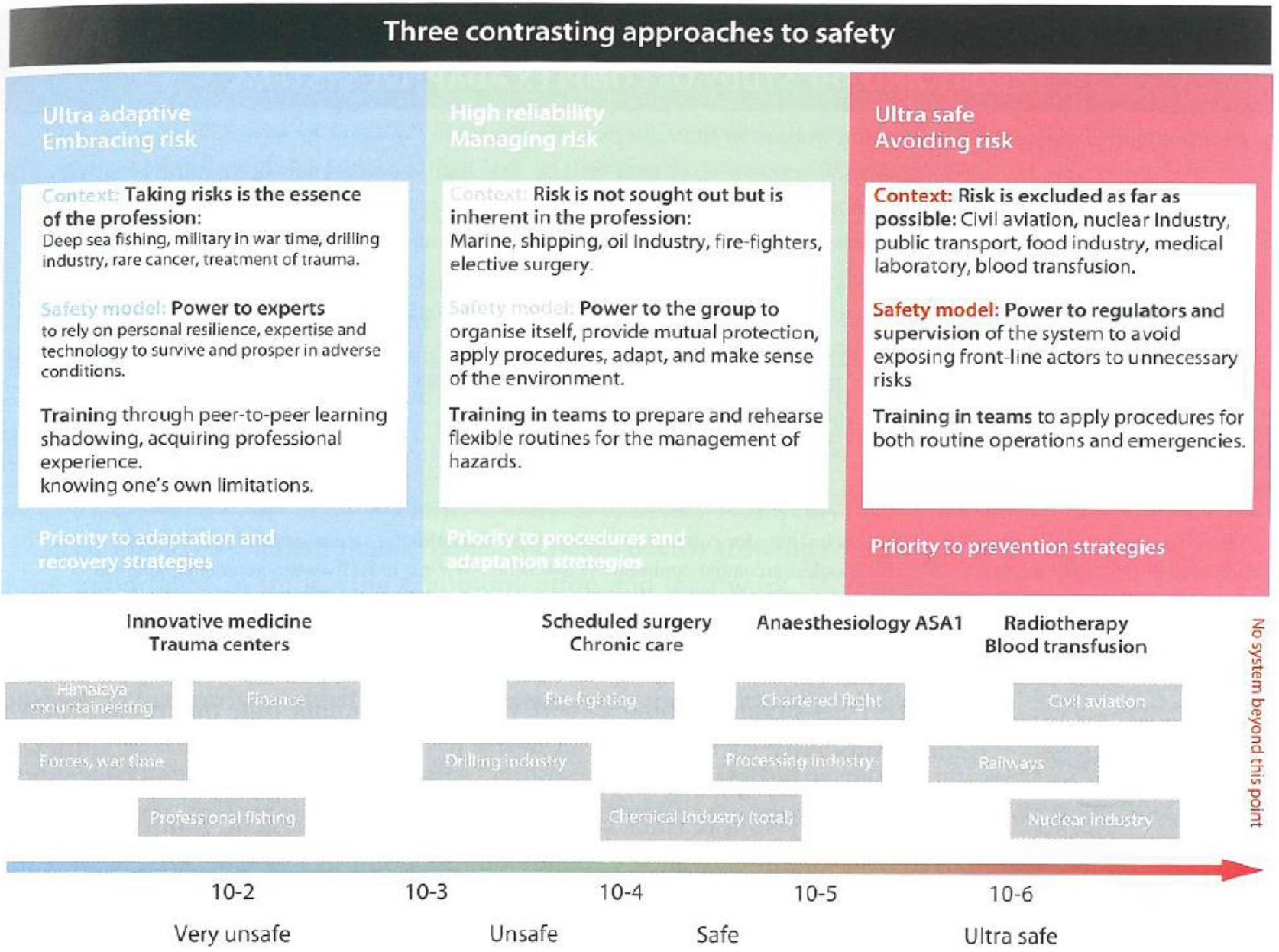


Figure 2-2 ▪ Vincent and Amalberti's model of contrasting approaches to safety. (Reproduced with permission from Vincent C, Amalberti R. *Safer Healthcare: Strategies for the Real World*. New York, NY: SpringerOpen; 2016. Copyright © 2016 SpringerOpen.)

5 Principles of HRO

- 1- preoccupation with failure
- 2- Reluctance to simplify
- 3- sensitivity to operations
- 4- commitment to resiliency
- 5- deference to expertise

General Principles of Patient Safety Improvement Strategies

- Error-proofing / goof-proof / Poka Yoke
- Standardization and simplification
- Learn from errors: M&M, incident reporting
- Forcing functions
- Communication and teamwork : Crew Resource management/ Systems Thinking
- Redundancies and Cross checks: checklists, readbacks, surgical site marking, patient identification before procedures.

The Online Learning Platform

World Health Organization

Patient Safety Quiz

Test your knowledge.

How much do you know about the new evolving discipline of patient safety? Take this brief quiz!

Start the quiz

Finally..

- Feel Overwhelmed?
- Don’t
- A lot of reiteration and repetitions are coming..


THANK
YOU