University of Toronto

UHN Princess Margaret Cancer Centre

WHY PATIENT SAFETY AND QUALITY IMPROVEMENT A MUST IN HEALTHCARE?

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Declaration and Conflict of Interest

I have no conflict of interest.

I am not going to discuss about Regulatory and Accreditation aspect.

I am currently doing a Masters course in Health Quality and Safety (MHQS) at Harvard Medical School, Boston.

I am an Active Clinical FACT Inspector.

fact
Foundation for the Accreditation of Cellular Therapy

HARVARD MEDICAL SCHOOL

Objectives…

Part-I

- Why safety is important and how to establish a safe environment in healthcare?
- How to investigate an ‘Unsafe’ event?

Part -II

- What do we mean by Quality improvement, Quality Methodologies and Quality improvement Tools?
- What are fundamental steps in Quality Improvement?

Libby Zion 1984

- An 18-year-old Medical student arrived at a Teaching Hospital Emergency department with fever.
- She died within 5 hours.
- Her family raised concerns that she died because of unsafe care and a lack of supervision of the medical staff
- A grand jury investigation was opened.

January: Phenelzine for stress

February: ASA-Oxycodone – For Tooth
Erythromycin & Chlorpheniramine – For Otitis

Also on Imipramine, Diazepam and Tetracycline

March : Febrile x 3 days

Arrives to ER at 11.30 pm
Seen by the JR who was not aware about all the previous drugs.

O/E –Hyperemic tympanic membrane, murmur, petechiae on thigh, leukocytosis, treated for sepsis,

Admitted to Medical Service: Noted to be agitated and shivering.

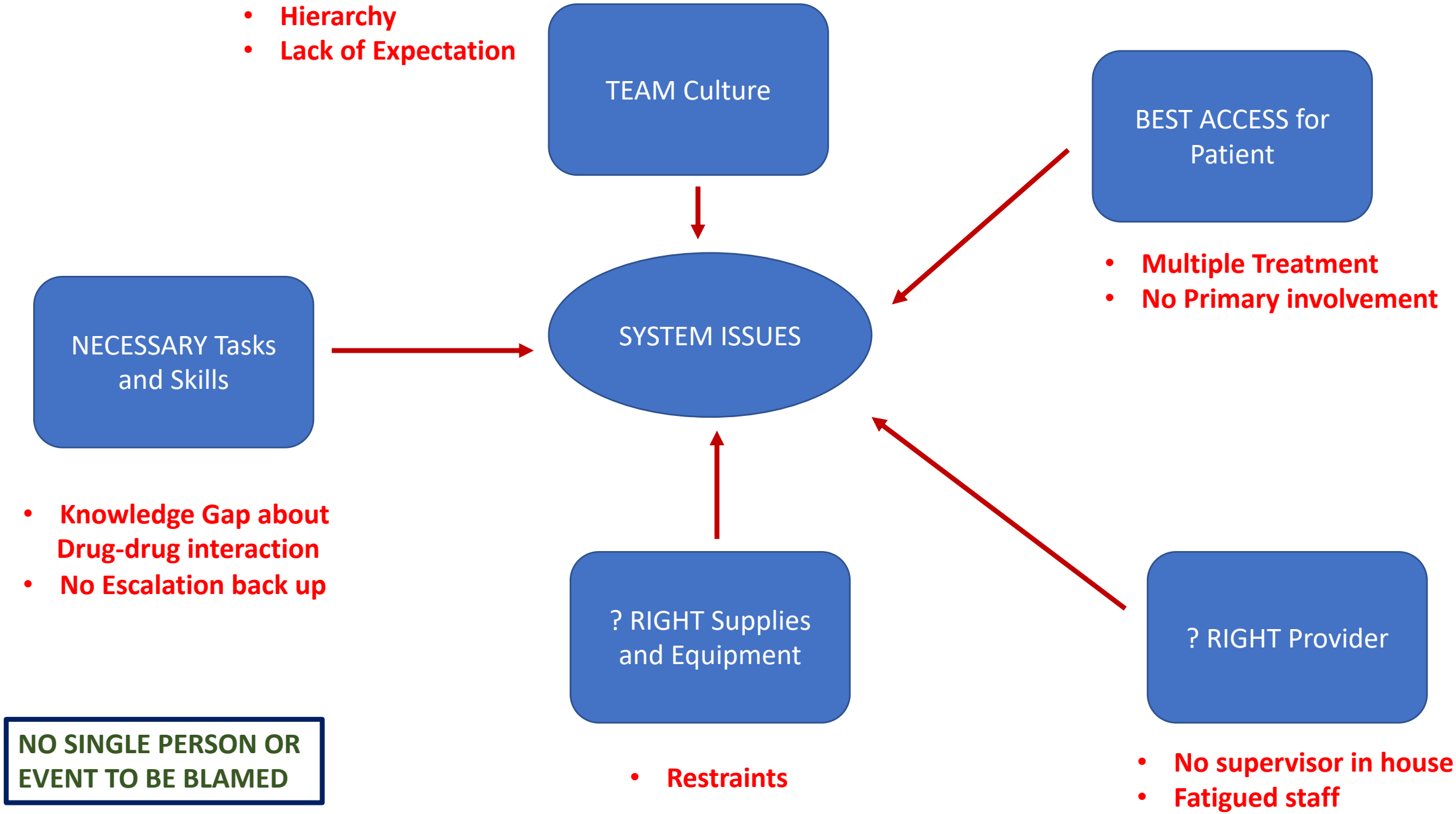
3.30 am – Given Meperidine - More confused
4.30 am – More restless. Not seen by MD.
Restraints and Haloperidol

4.30 -6.00 am – Quiet but still febrile

6.30 am –Suffers a cardiac arrest and dies.

Medical Examiner's Report:

1. Hyperpyrexia
2. Cardiovascular collapse


• Hierarchy
• Lack of Expectation
TEAM Culture
BEST ACCESS for Patient
• Multiple Treatment
• No Primary involvement
NECESSARY Tasks and Skills
SYSTEM ISSUES
• Knowledge Gap about Drug-drug interaction
• No Escalation back up
? RIGHT Supplies and Equipment
? RIGHT Provider
• Restraints
• No supervisor in house
• Fatigued staff
NO SINGLE PERSON OR EVENT TO BE BLAMED

SPECIAL ARTICLES

INCIDENCE OF ADVERSE EVENTS AND NEGLIGENCE IN HOSPITALIZED PATIENTS

Results of the Harvard Medical Practice Study I

Troyen A. Brennan, M.P.H., M.D., J.D., Lucian L. Leape, M.D., Nan M. Laird, Ph.D., Liesi Hebert, Sc.D., A. Russell Localio, J.D., M.S., M.P.H., Ann G. Lawthers, Sc.D., Joseph P. Newhouse, Ph.D., Paul C. Weiler, LL.M., and Howard H. Hiatt, M.D.

Abstract *Background.* As part of an interdisciplinary study of medical injury and malpractice litigation, we estimated the incidence of adverse events, defined as injuries caused by medical management, and of the subgroup of such injuries that resulted from negligent or substandard care.

Methods. We reviewed 30,121 randomly selected rec- permanently disabling injuries and 13.6 percent led to death. The percentage of adverse events attributable to negligence increased in the categories of more severe injuries (Wald test $\chi^2 = 21.04$, $P<0.0001$). Using weighted totals, we estimated that among the 2,671,863 patients discharged from New York hospitals in 1984 there were 98,609 adverse events and 27,179 adverse events

1991

- **30,121 randomly selected patient's records.**
- **Total of 98,609 adverse events in the US**

1994:

Drug Complications -19%
Wound infection -14%
Operation related – 48%

Medical cases more likely to be negligent. Diagnostic mishaps, non surgical therapeutics, events in the ED and errors in management.

THE NATURE OF ADVERSE EVENTS IN HOSPITALIZED PATIENTS

Results of the Harvard Medical Practice Study II

Lucian L. Leape, M.D., Troyen A. Brennan, M.D., J.D., M.P.H., Nan Laird, Ph.D., Ann G. Lawthers, Sc.D., A. Russell Localio, J.D., M.P.H., Benjamin A. Barnes, M.D., Liesi Hebert, Sc.D., Joseph P. Newhouse, Ph.D., Paul C. Weiler, LL.M., and Howard Hiatt, M.D.

Abstract *Background.* In a sample of 30,195 randomly selected hospital records, we identified 1133 patients (3.7 percent) with disabling injuries caused by medical treatment. We report here an analysis of these adverse events and their relation to error, negligence, and disability.

Methods. Two physician-reviewers independently identified the adverse events and evaluated them with respect to negligence, errors in management, and extent of disability. One of the authors classified each event according to type of injury. We tested the significance of differences in rates of negligence and disability among catego- gery were less likely to be caused by negligence (17 percent) than nonsurgical ones (37 percent). The proportion of adverse events due to negligence was highest for diagnostic mishaps (75 percent), noninvasive therapeutic mishaps ("errors of omission") (77 percent), and events occurring in the emergency room (70 percent). Errors in management were identified for 58 percent of the adverse events, among which nearly half were attributed to negligence.

Conclusions. Although the prevention of many adverse events must await improvements in medical knowl-

Betsey Lehman -1994

- Reporter received overdose of Chemotherapy

  4000 mg/m2 over 4 days

- Doctors left; Family sued

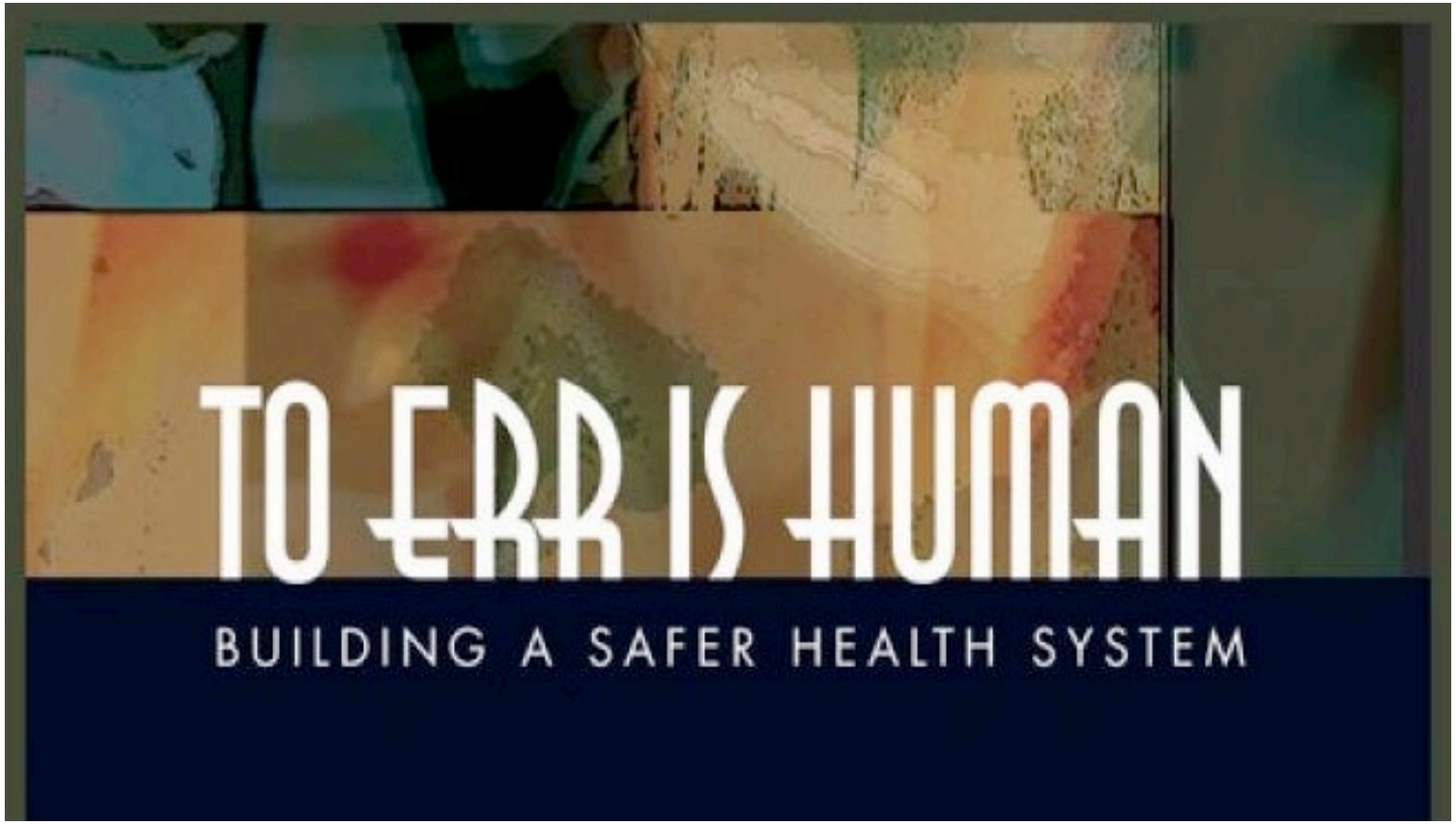
- Dana Farber Cancer Institute

  IT Support
  Safety over convenience
  Oversight of safety
  Supervision
  Increased Transparency: Patient and Family council

DANA-FARBER ADMITS DRUG OVERDOSE CAUSED DEATH OF GLOBE COLUMNIST, DAMAGE TO SECOND WOMAN

When 39-year-old Betsy A. Lehman died suddenly last Dec. 3 at Boston's Dana-Farber Cancer Institute, near the end of a grueling three-month treatment for breast cancer, it seemed a tragic reminder of the risks and limits of high-stakes cancer care. In fact, it was something very different. The death of Lehman, a Boston Globe health columnist, was due to a horrendous mistake: a massive overdose of a powerful anticancer drug that ravaged her heart, causing it to fail suddenly….

5 The Boston Globe 3/23/1995



1999

- **44,000 – 98,000 Americans die each year as a result of medical error.**
- **Costs of $ 17-29 billion for inpatient care**
- **Hidden Cost (Loss of Trust; loss of provider satisfaction; loss to the society)**

A BOEING 747 CRASH EVERY ALTERNATE DAY / WEEK !!

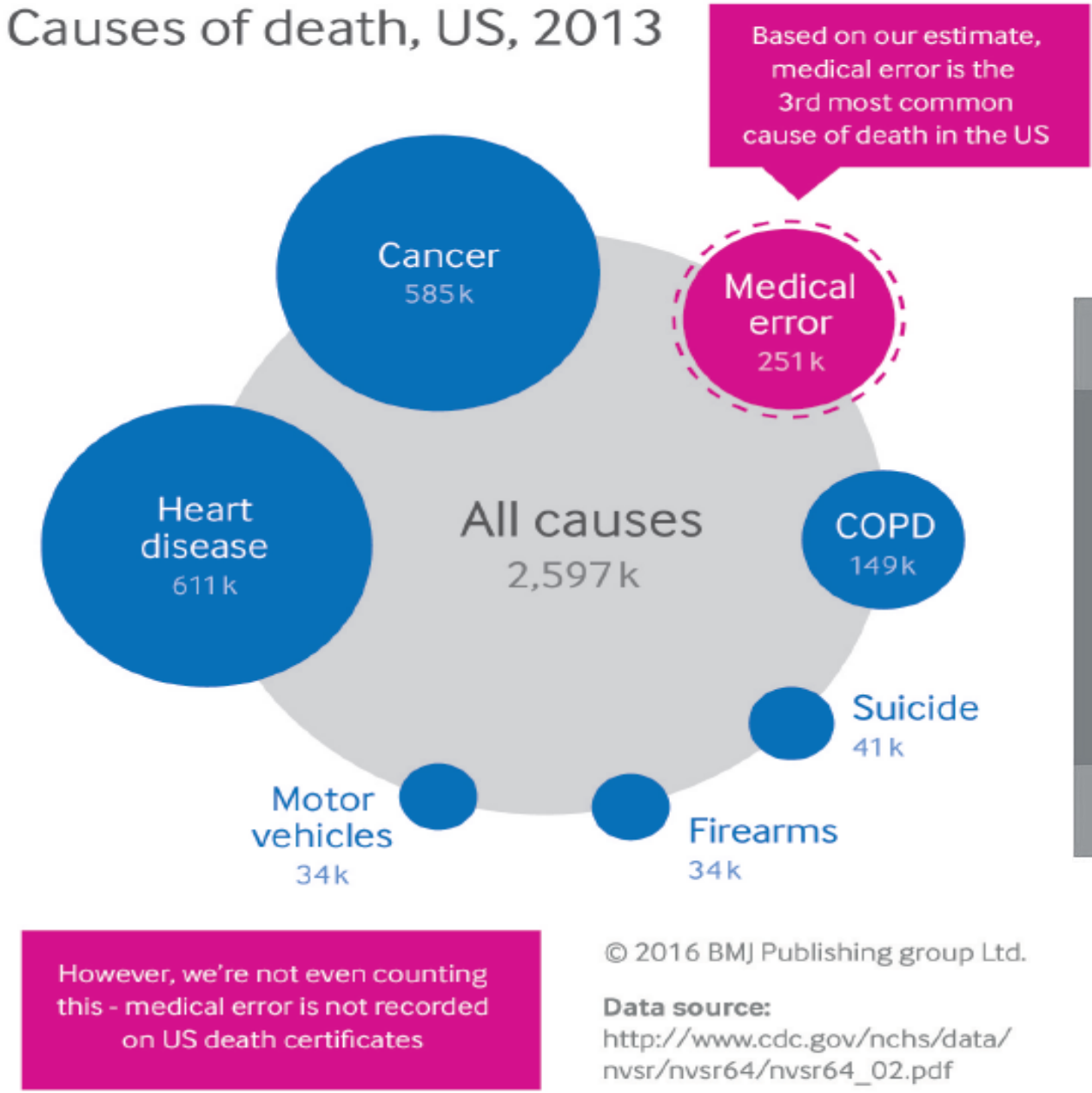
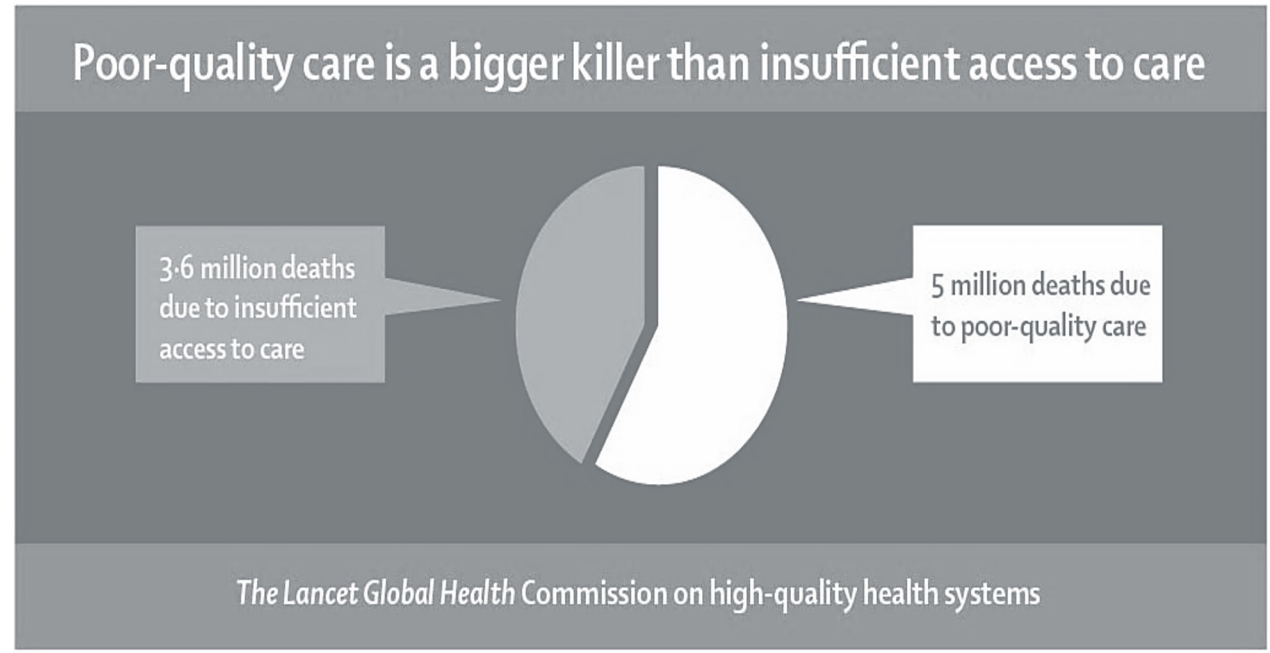


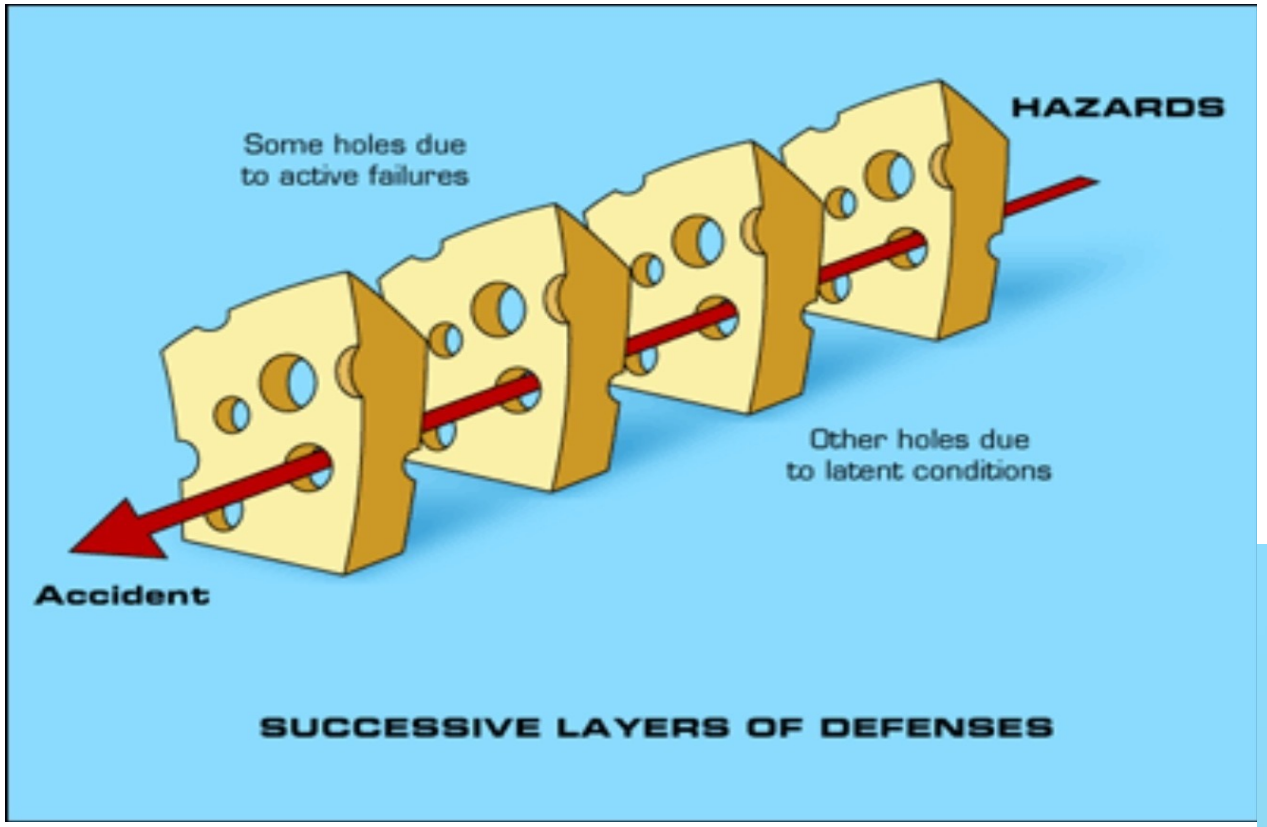
Fig 1 Most common causes of death in the United States, 2013[2]

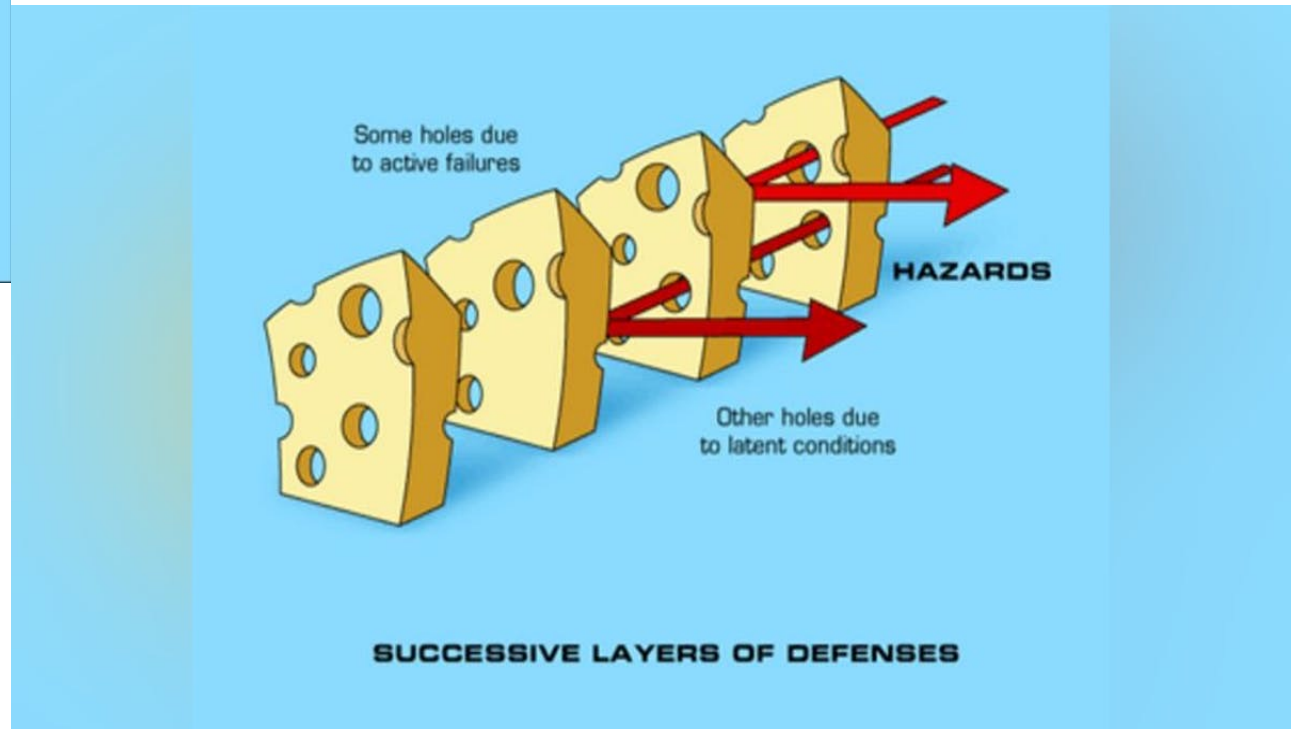


Kruk ME et al, *The Lancet*, Sept 2018

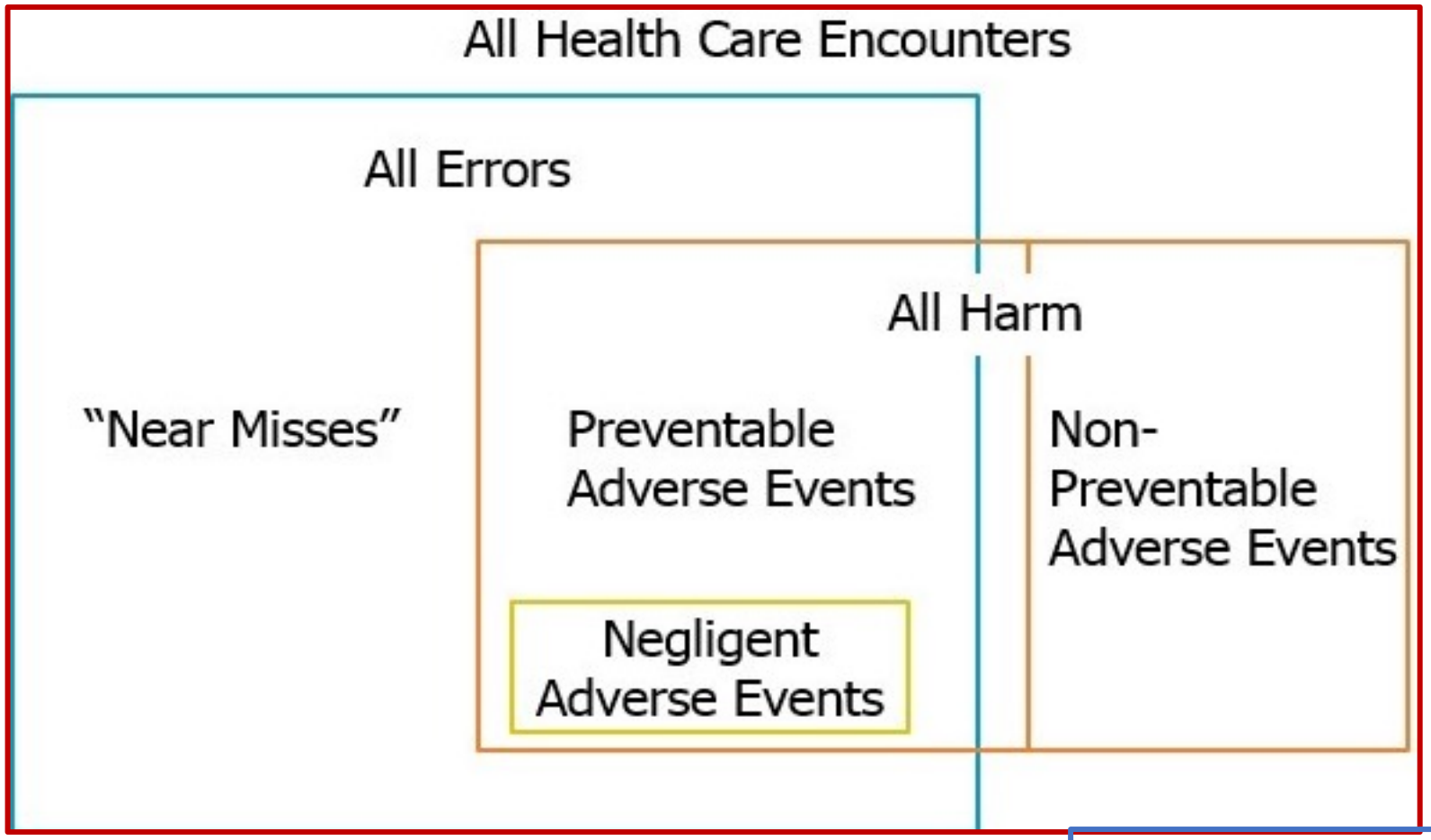
5 MILLIONS DIE GLOBALLY DUE TO POOR-QUALITY CARE.

SWISS CHEESE MODEL – JAMES REASON





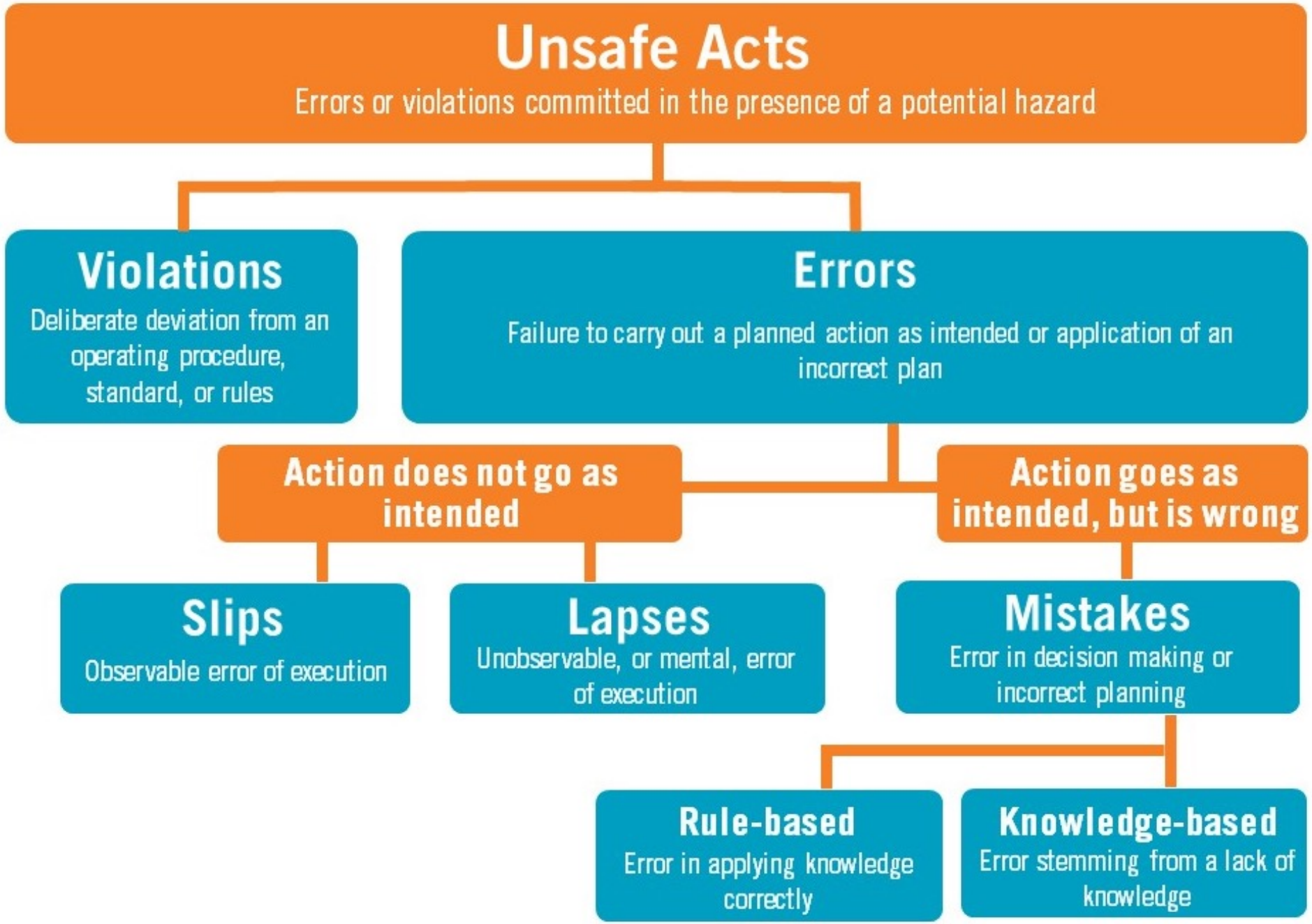
ADVERSE EVENTS: **Anytime a patient suffers a negative outcome from an interaction with the healthcare system**



- HARM
- NO HARM
- NEAR MISSES

Preventable Adverse Events:

Medication Errors
Procedural Errors
Diagnostic Errors


Unsafe Acts
Errors or violations committed in the presence of a potential hazard
Violations
Deliberate deviation from an operating procedure, standard, or rules
Errors
Failure to carry out a planned action as intended or application of an incorrect plan
Action does not go as intended
Action goes as intended, but is wrong
Slips
Observable error of execution
Lapses
Unobservable, or mental, error of execution
Mistakes
Error in decision making or incorrect planning
Rule-based
Error in applying knowledge correctly
Knowledge-based
Error stemming from a lack of knowledge

Taking a new perspective

Patients & families experiencing harmful events ≥5 yrs ago report…

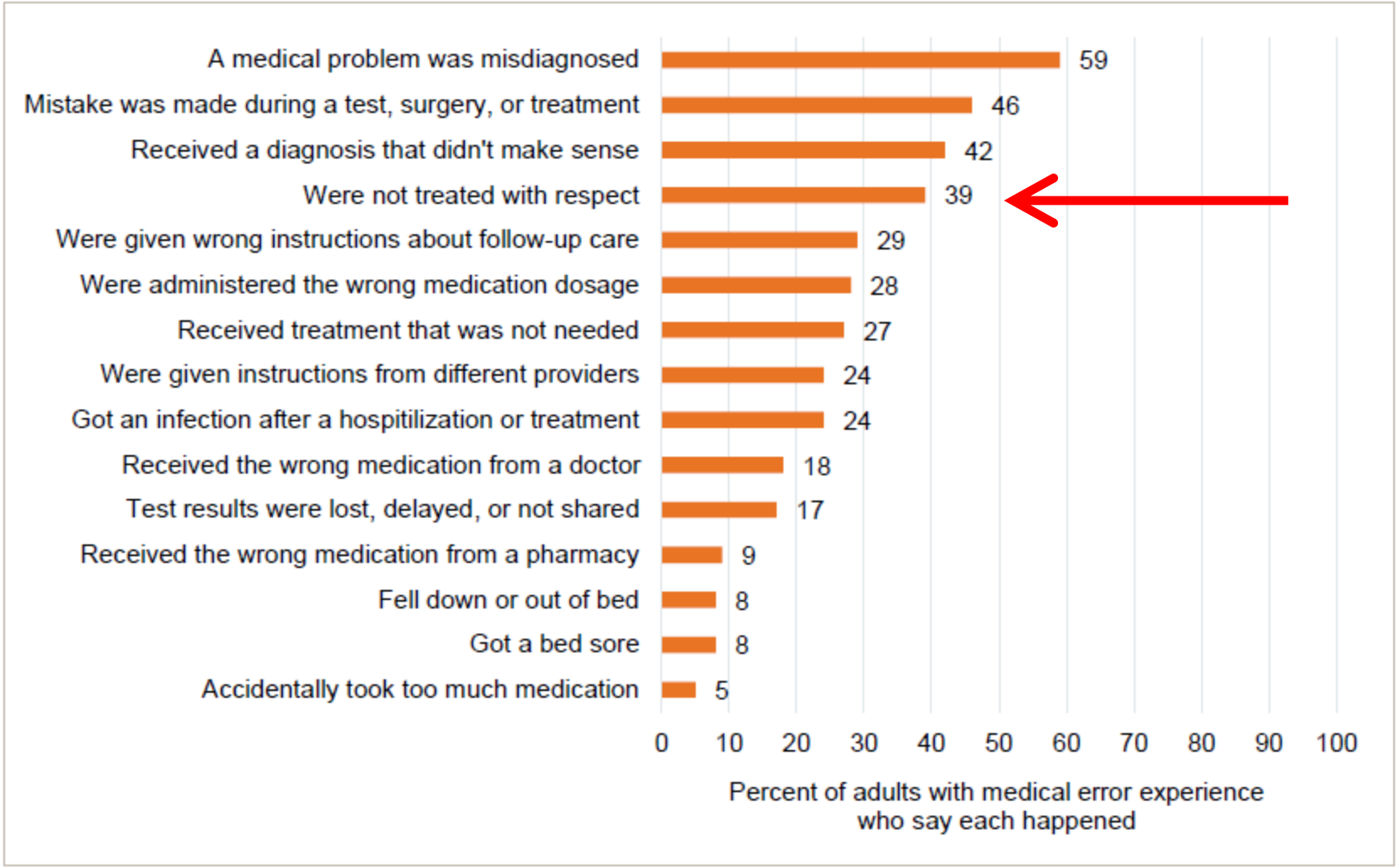
66% lasting physical impacts

"non-physical"

- **59% altered life/view of self**
- **53% vivid memories**
- **50% loss of trust in healthcare**
- **50% anger**
- **34% grief**
- **34% "psychological scars" (depression, suicidality, paranoia, PTSD)**
- **31% financial impacts**
- **31% altered healthcare seeking behaviors**
- **28% self-blame**

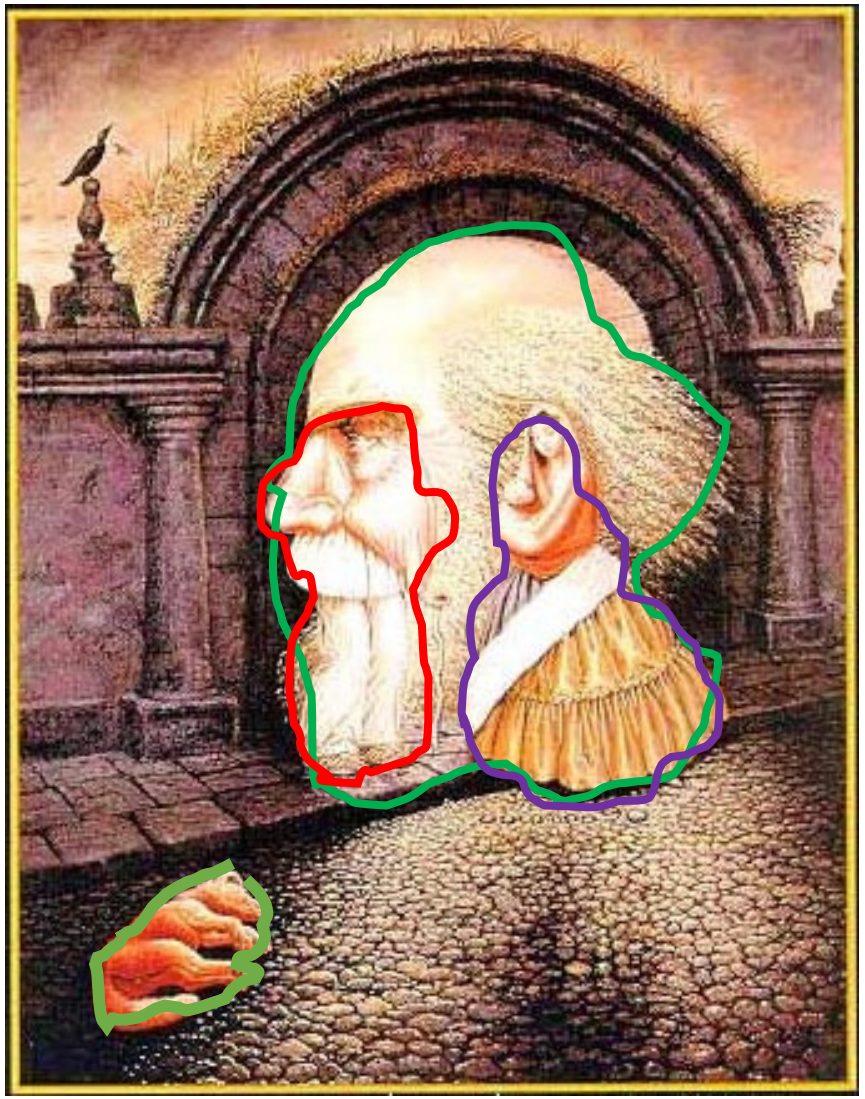
Taking a new perspective

Americans asked about the nature of their experience with error say…



NORC at the University of Chicago and IHI/NPSF Lucian Leape Institute. (2017). Americans' Experiences with Medical Errors and Views on Patient Safety. CHICAGO, IL. – web/phone-based survey of >2500 Americans

WHAT DO YOU SEE ?



TWO COMPETING SYSTEMS OF THOUGHT

System 1

- Automatic
- Intuitive
- Involuntary
- Effortless
- Ex. Driving "How did I get here?"
- Less energy

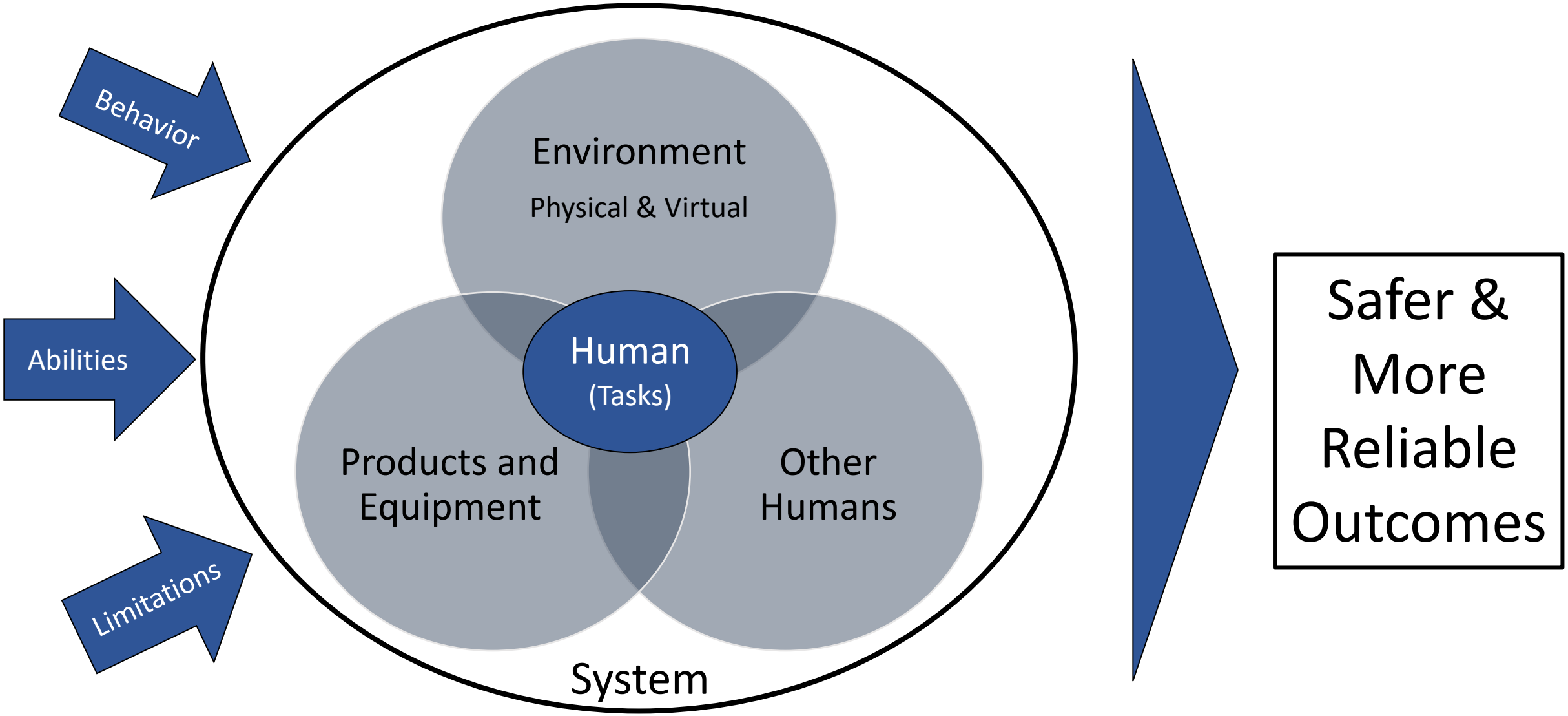
Constant Conflict

System 2

- Deliberating
- Problem solving
- Reasoning
- Concentrating
- Ex. Solving a complex math problem
- More energy

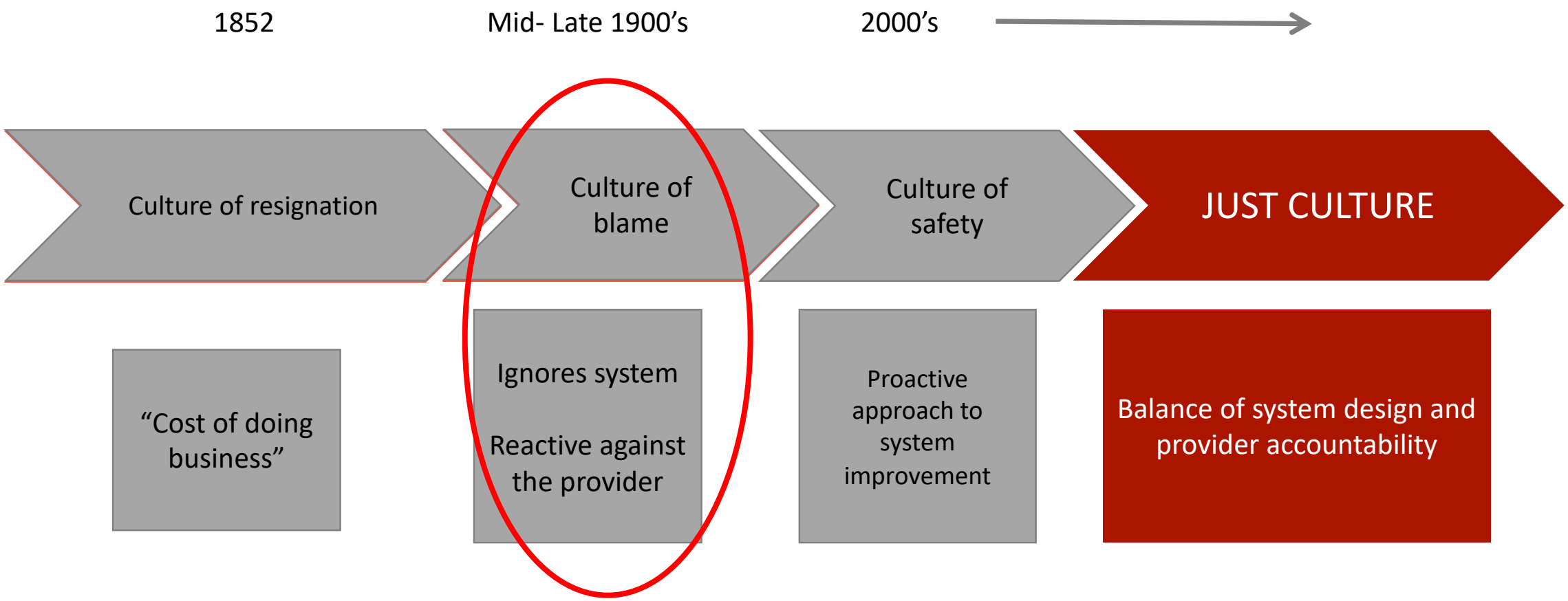
1.Kahneman, D. (2011). Thinking, fast and slow.

Human Factors: Interactions

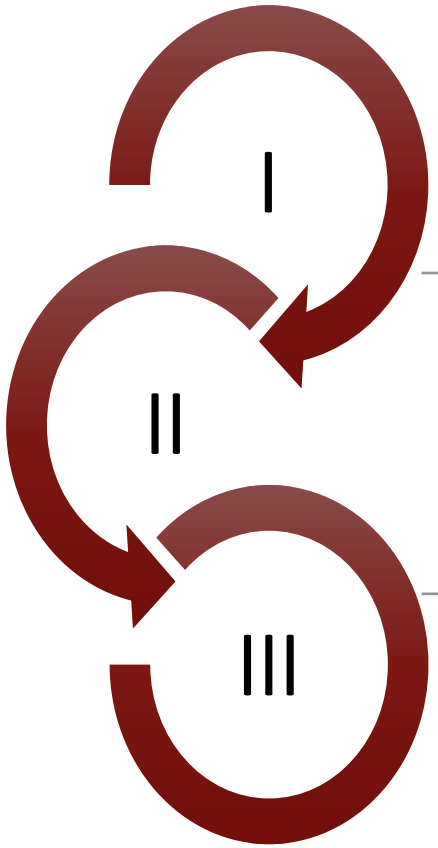


Stress, Fatigue, Distraction, Noise, Boredom, Interruption, Fixation, Reliance on Memory, issues related to communication

AN EVOLUTION OF CULTURE



JUST CULTURE

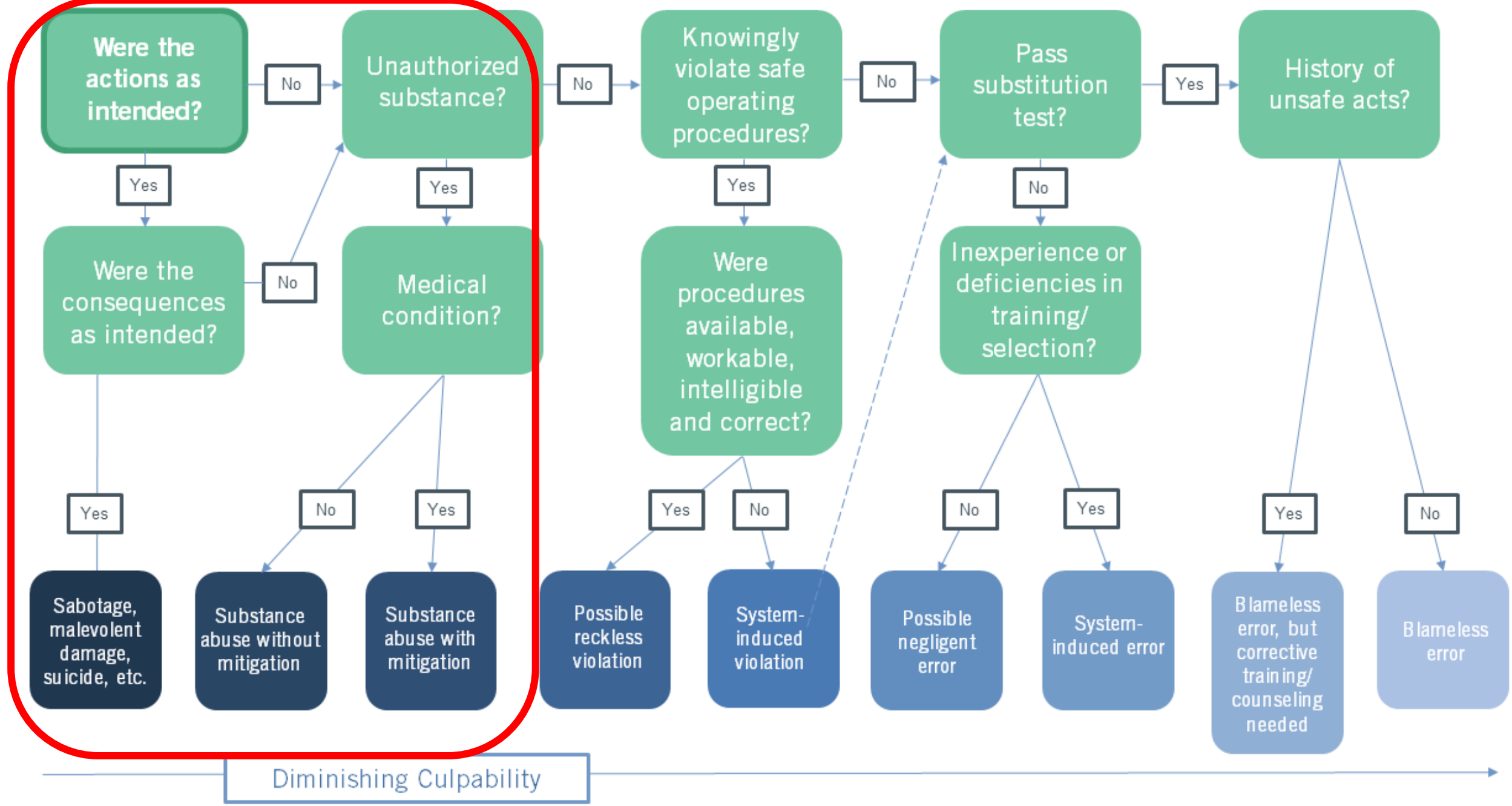


A culture that supports and rewards people for sharing essential safety-related information

Providers trust that they will not be blamed for system issues

Systems are constructed to support providers, but providers are accountable for their behavior

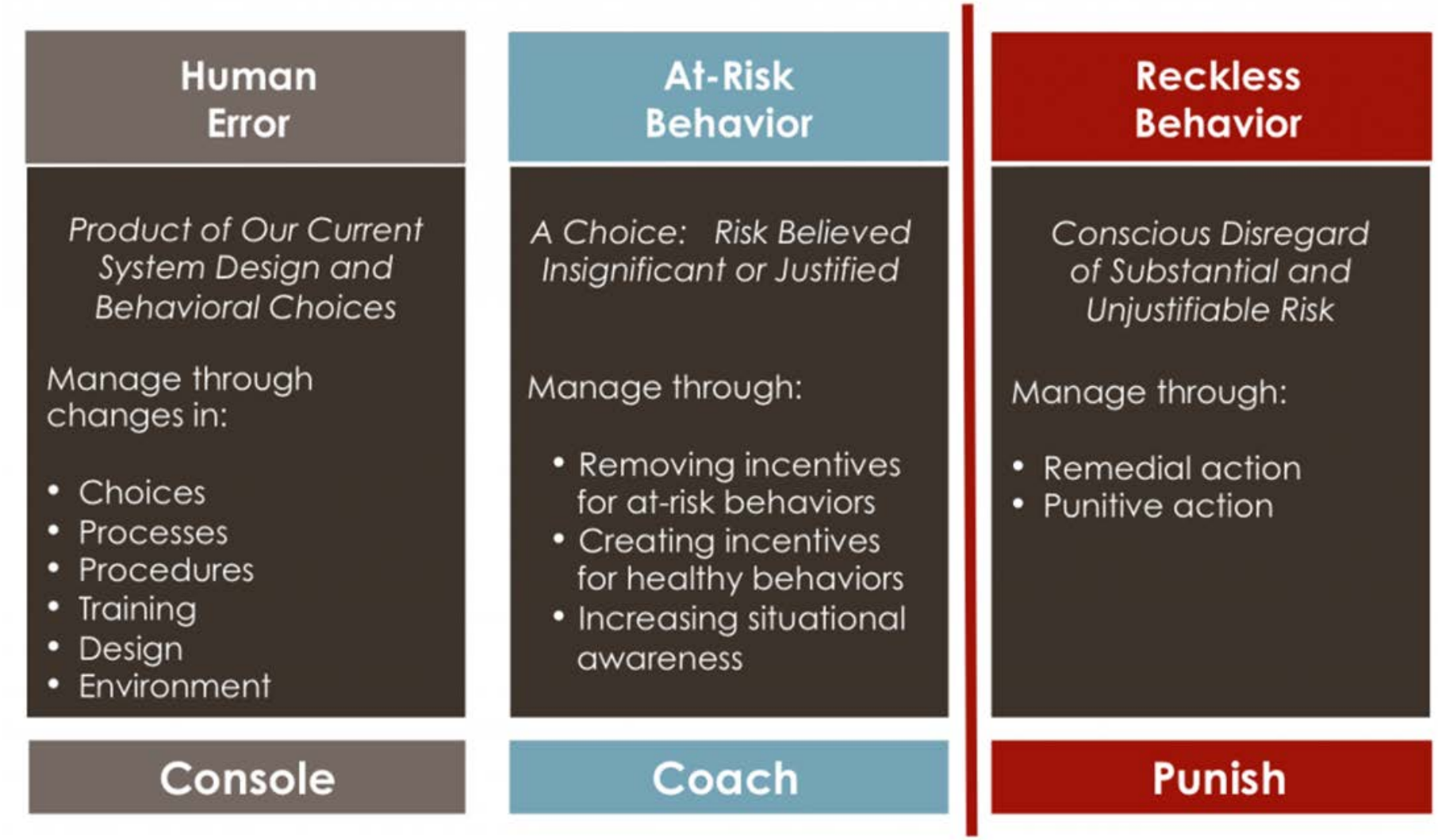
David Marx, 2001



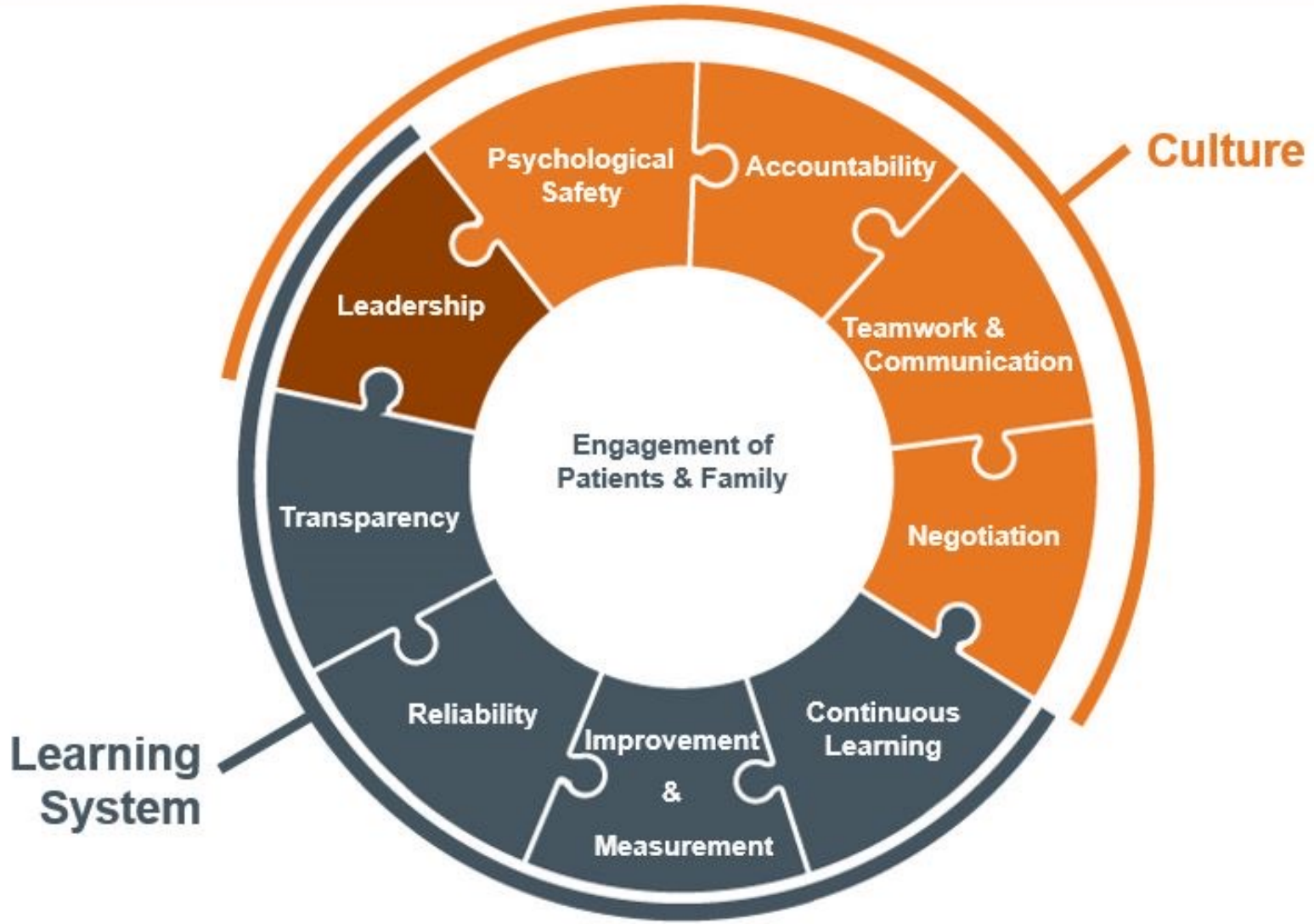
Decision Tree for Determining Culpability of Unsafe Acts

Reason, J., Managing the Risks of Organizational Accidents

Just Culture Responses



Framework for Safe, Reliable, and Effective Care



CULTURE + SYSTEM = SAFETY

Source: 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. (Available on ihi.org)

EVENT ANALYSIS

1. Decision to Review

2. Select People and Gather Data

3. Determine Incident Chronology

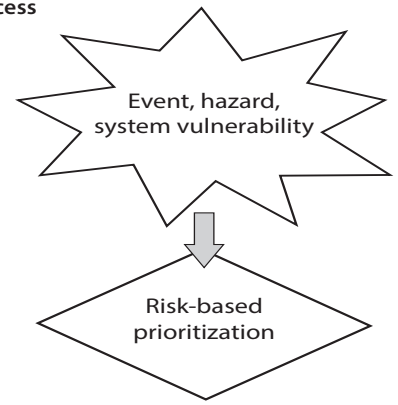
4. Identify Care Delivery Problems

5. Identify Contributory Factors

6. Making Recommendations & Developing an Action Plan

VA National Center for Patient Safety:
https://www.patientsafety.va.gov/

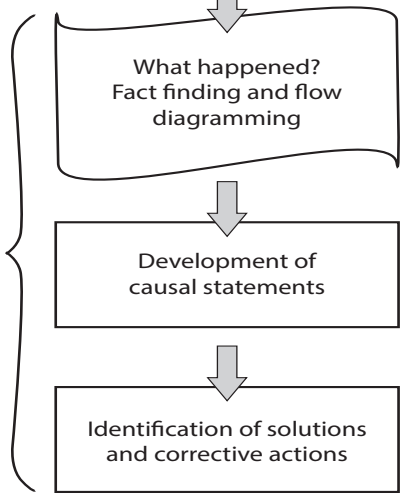
Figure 2. Individual RCA² Process



Immediate actions are taken to care for the patient, make the situation safe for others, and sequester equipment, products, or materials.

Patient safety, risk or quality management is typically responsible for the prioritization; for consistency one person is assigned responsibility for applying the risk matrix. See Appendix 1.

72 hours



Typically a single RCA² team is responsible for the entire review process, however, if different staff is used for these RCA² review phases it is recommended that a core group of staff from the RCA² team participate on all phases for consistency and continuity.

Multiple meetings of 1.5 required to: prepare a Appendix 3); visit th devices; and prepa Managers/supervi processes or area feedback for the

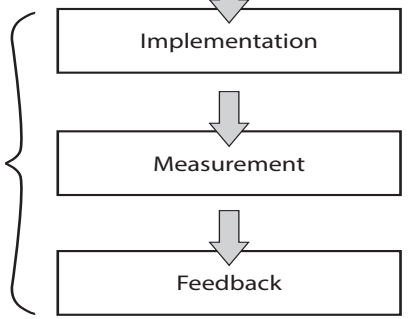
See Appendix 2 fo Questions.

See Appendix 6 for the

Patients/families and managers/super responsible for the process or area should be provided feedback and consulted for additional ideas; however they should not have final decision authority over the team's work. See Figure 3 for the Action Hierarchy.

30–45 days

30–45 days



The RCA² team is not usually responsible for these activities.

A responsible individual with the authority to act, not a team or committee, should be responsible for ensuring action implementation.

Each action should have a process or outcome measure identifying what will be measured, the expected compliance level, and the date it will be measured. An individual should be identified who will be responsible for measuring and reporting on action effectiveness.

Feedback should be provided to the CEO/board, service/department, staff involved, patient and/or patient's family, the organization, and the patient safety organization (if relevant).

RISK BASED AND NOT HARM BASED

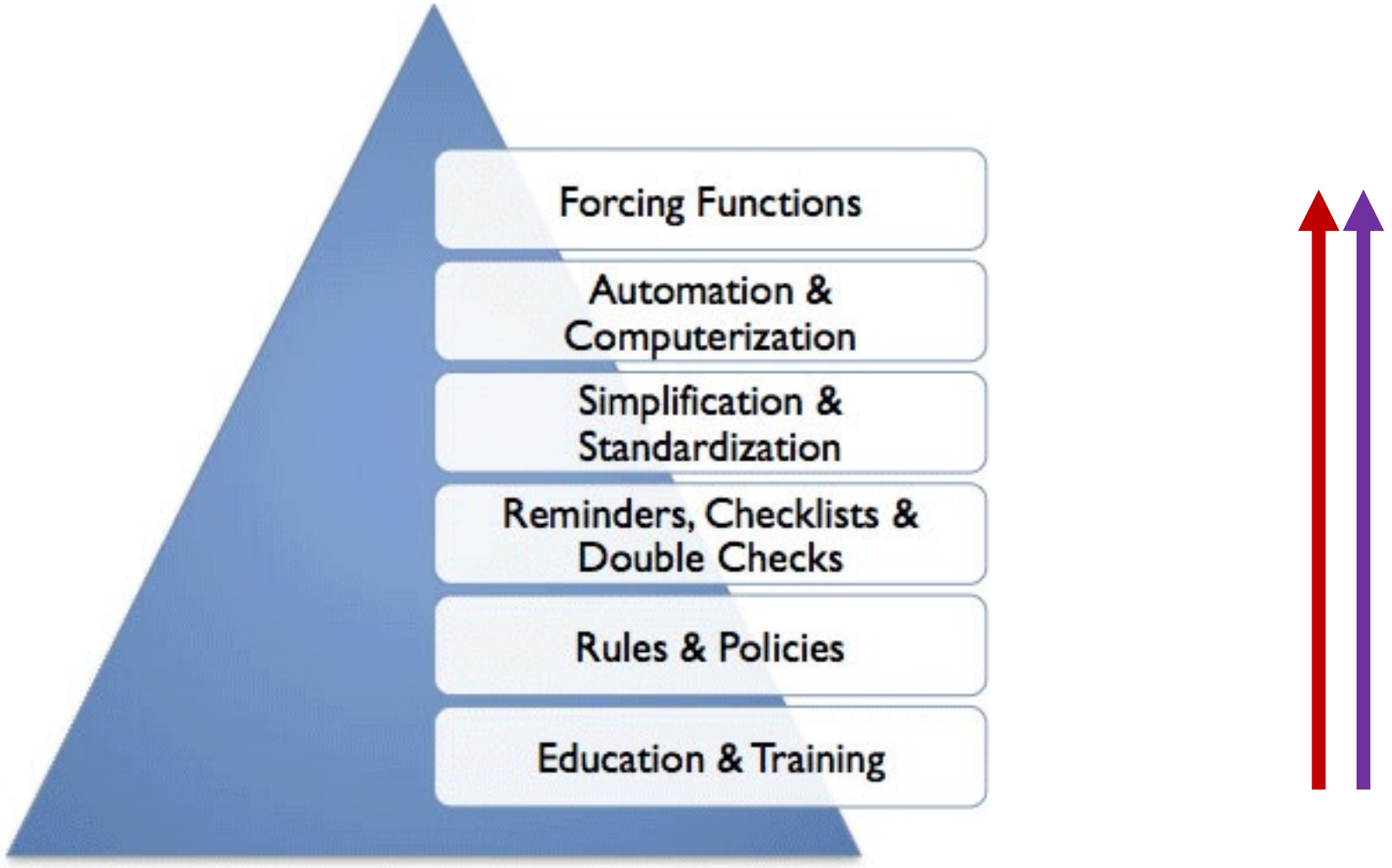
Catastrophic	Major
Patients with Actual or Potential: Death or major permanent loss of function (sensory, motor, physiologic, or intellectual) **not related to the natural course of the patient's illness or underlying condition** (i.e., acts of commission or omission). This includes outcomes that are a direct result of injuries sustained in a fall; or associated with an unauthorized departure from an around-the-clock treatment setting; or the result of an assault or other crime. Any of the adverse events defined by the Joint Commission as reviewable "Sentinel Events" should also be considered in this category. …eath; **or** hospitalization of three or more visitors …ospitalization of three or more staff*	**Patients with Actual or Potential:** Permanent **lessening** of bodily functioning (sensory, motor, physiologic, or intellectual) **not related to the natural course of the patient's illness or underlying conditions** (i.e., acts of commission or omission) **or** any of the following: a. Disfigurement b. Surgical intervention required c. Increased length of stay for three or more patients d. Increased level of care for three or more patients **Visitors:** Hospitalization of one or two visitors **Staff:** Hospitalization of one or two staff **or** three or more staff experiencing lost time or restricted duty injuries or illnesses **Equipment or facility:** Damage equal to or more than $100,000**, ♦
…**tial:** Increased length of stay **or** …r two patients …ment for one or two visitors (less …me or restricted duty injuries or …nage more than $10,000, but less than	**Minor** **Patients with Actual or Potential:** No injury, nor increased length of stay nor increased level of care **Visitors:** Evaluated and no treatment required **or** refused treatment **Staff:** First aid treatment only with no lost time, nor restricted duty injuries nor illnesses **Equipment or facility**: Damage less than $10,000 or loss of any utility without adverse patient outcome (e.g., power, natural gas, electricity, water, communications, transport, heat and/or air conditioning)**, ♦

3. How the Safety Assessment Codes (SAC) Matrix Looks

Probability and Severity	Catastrophic	Major	Moderate	Minor
Frequent	3	3	2	1
Occasional	3	2	1	1
Uncommon	3	2	1	1
Remote	3	2	1	1

NPSF National Patient Safety Foundation
268 Summer Street | Boston, MA 02210 | 617.391.9900 | www.npsf.org

HIERARCHY OF INTERVENTION EFFECTIVENESS

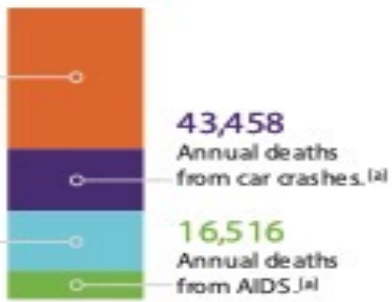


FREE FROM HARM:

ACCELERATING PATIENT SAFETY IMPROVEMENT FIFTEEN YEARS AFTER *TO ERR IS HUMAN*

Report of an expert panel convened by the National Patient Safety Foundation argues for looking at morbidity as well as mortality caused by medical errors and going beyond hospitals to improve safety across the continuum of care.

TO ERR IS HUMAN FRAMED PATIENT SAFETY AS A SERIOUS PUBLIC HEALTH ISSUE (1999 ESTIMATES)



BY SOME MEASURES, HEALTH CARE HAS GOTTEN SAFER SINCE TO ERR IS HUMAN

1.3 Million

Estimated reduction in hospital-acquired conditions (2011-2013) as a result of the federal Partnership for Patients initiative.[b]

TO UNDERSTAND THE FULL IMPACT OF PATIENT SAFETY PROBLEMS, WE MUST LOOK AT BOTH MORTALITY AND MORBIDITY

1 in 10

patients develops a health care acquired condition (such as infection, pressure ulcer, fall, adverse drug event) during hospitalization.[b]

BUT WE MUST LOOK BEYOND HOSPITALS TO THE FULL CARE CONTINUUM

Roughly 1 billion ambulatory visits occur in the US each year.[c]

About 35 million hospital admissions occur annually.[c]

ADVANCEMENT IN PATIENT SAFETY REQUIRES AN OVERARCHING SHIFT FROM REACTIVE, PIECEMEAL INTERVENTIONS TO A TOTAL SYSTEMS APPROACH TO SAFETY[d]

1. Ensure that leaders establish and sustain a safety culture.
2. Create centralized and coordinated oversight of patient safety.
3. Create a common set of safety metrics that reflect meaningful outcomes.
4. Increase funding for research in patient safety and implementation science.
5. Address safety across the entire care continuum.
6. Support the health care workforce.
7. Partner with patients and families for the safest care.
8. Ensure that technology is safe and optimized to improve patient safety.

Sources: (a) Institute of Medicine. To Err Is Human: Building a Safer Health System. Washington, DC: The National Academies Press, 2000. (b) 2013 Annual Hospital-Acquired Condition Rate and Estimates of Cost Savings and Deaths Averted From 2010 to 2013. Rockville, MD: Agency for Healthcare Research and Quality; October 2015. AHRQ Publication No. 16-0006-EF. http://www.ahrq.gov/professionals/quality-patient-safety/pfp/index.html. (c) National Center for Health Statistics. Faststats A-Z. Ambulatory Care and Hospital Utilization. Available at: http://www.cdc.gov/nchs/fastats/ (d) National Patient Safety Foundation. Free from Harm: Accelerating Patient Safety Improvement Fifteen Years after To Err is Human. Boston, MA: National Patient Safety Foundation; 2015. Available at: http://www.npsf.org/free-from-harm.

S	**Situation:** I am (name), (X) nurse on ward (X) I am calling about (patient X). I am calling because ... I am concerned that ... (eg blood pressure is low/high, pulse is XX, temperature is XX, Early Warning Score is XX)
B	**Background:** Patient (X) was admitted on (XX date) with ... (eg MI/chest infection) They have had (X operation/procedure/investigation) Patient (X)'s condition has changed in the last (XX mins) Their last set of observations were (XX) Patient (X)'s normal condition is ... (eg alert/drowsy/confused, pain free)
A	**Assessment:** I think the problem is (XXX) And I have ... (eg given O_2/analgesia, stopped the infusion) OR I am not sure what the problem is but patient (X) is deteriorating OR I don't know what is wrong but I am worried
R	**Recommendation**: I need you to ... Come to see the patient in the next (XX mins) AND Is there anything I need to do in the meantime? (eg stop the fluid/repeat the observations)

TEACH-BACK

C-U-S (Concerned –Uncomfortable –Safety)

I-PASS

BETTER HANDOFFS. SAFER CARE.

I	Illness Severity	• Stable, "watcher," unstable
P	Patient Summary	• Summary statement • Events leading up to admission • Hospital course • Ongoing assessment • Plan
A	Action List	• To do list • Time line and ownership
S	Situation Awareness and Contingency Planning	• Know what's going on • Plan for what might happen
S	Synthesis by Receiver	• Receiver summarizes what was heard • Asks questions • Restates key action/to do items

CONCLUSION -PART-I

TO REMEMBER…..

- ***Human error is inevitable***
- ***Make it easy for people to do the right thing***
- ***Make it hard for people to do the wrong thing***
- ***Stop trying to fix people***
- ***Start trying to fix systems***
- ***Work on changing the culture***

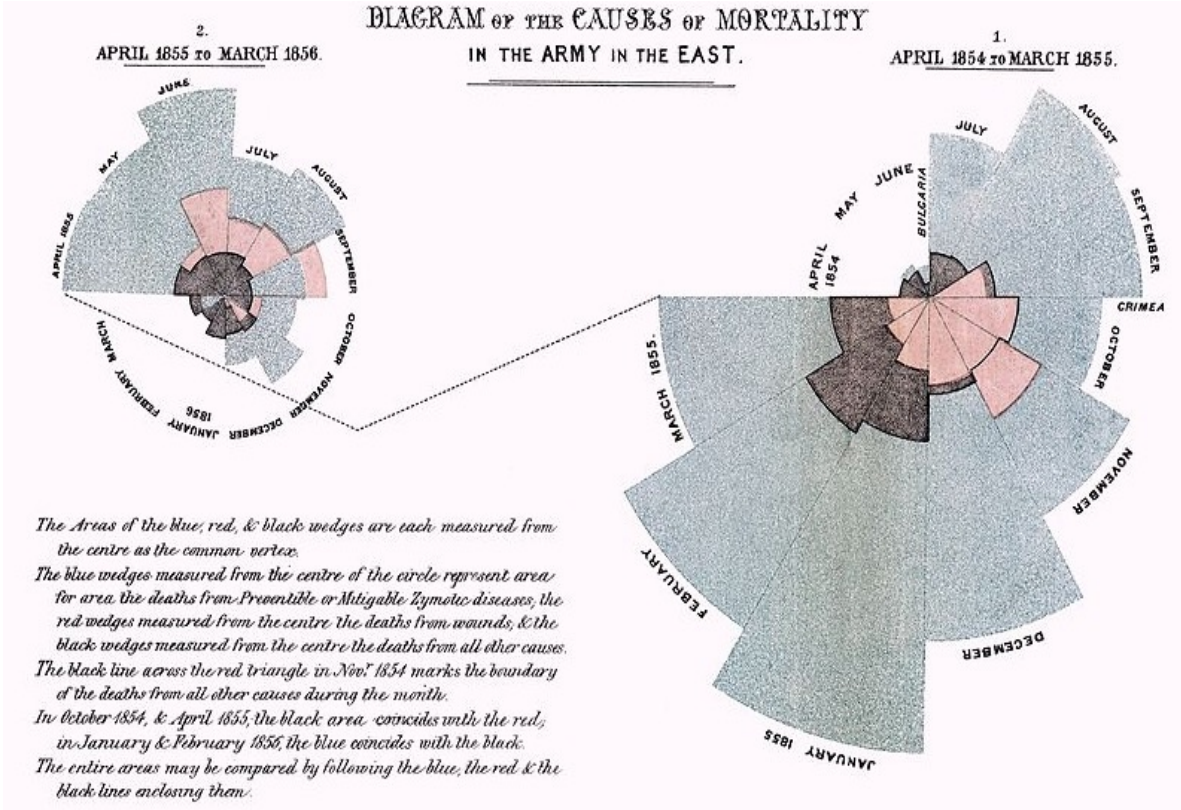
PART-II

Where the story of QI begins…

Florence Nightingale (1820-1910)

"It may seem a strange principle to enunciate as the very first requirement in a hospital that it should do the sick no harm" (Nightingale)

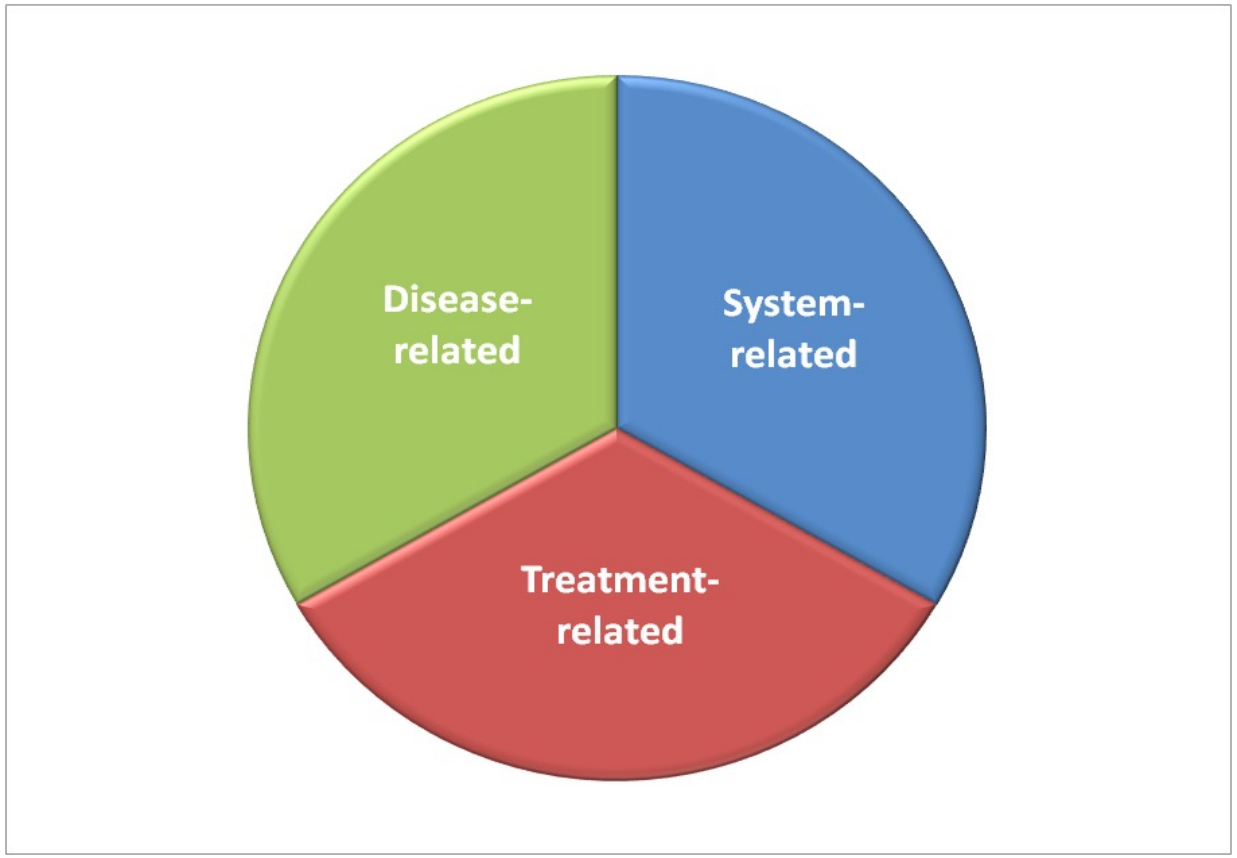
" Her statistics were more than a study; they were indeed her religion …. To understand God's thoughts, she held we must study statistics, for these are the measure of his purpose" (Karl Pearson,1924)



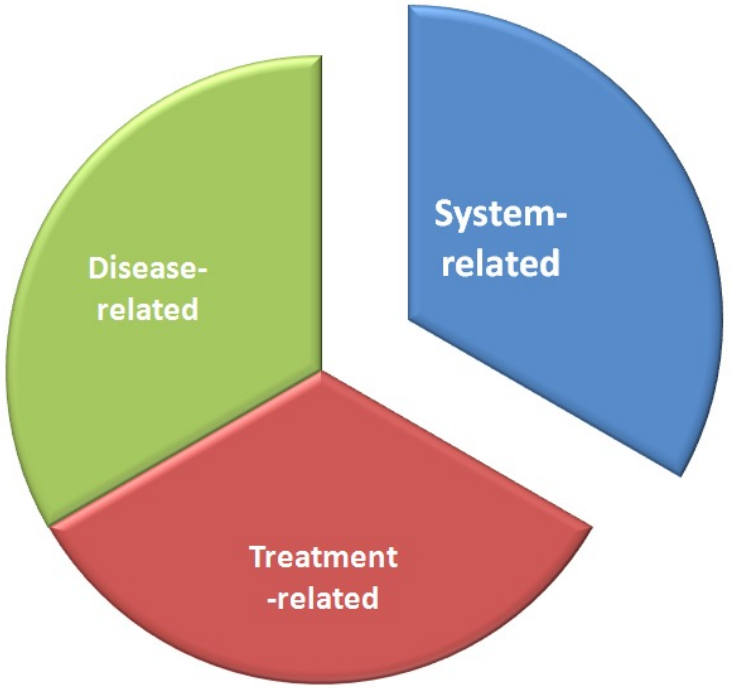
Crimean War – battlefield findings

"The Lady with the Lamp"

QI –PATIENT PERSPECTIVE…..



3 Forms of Suffering



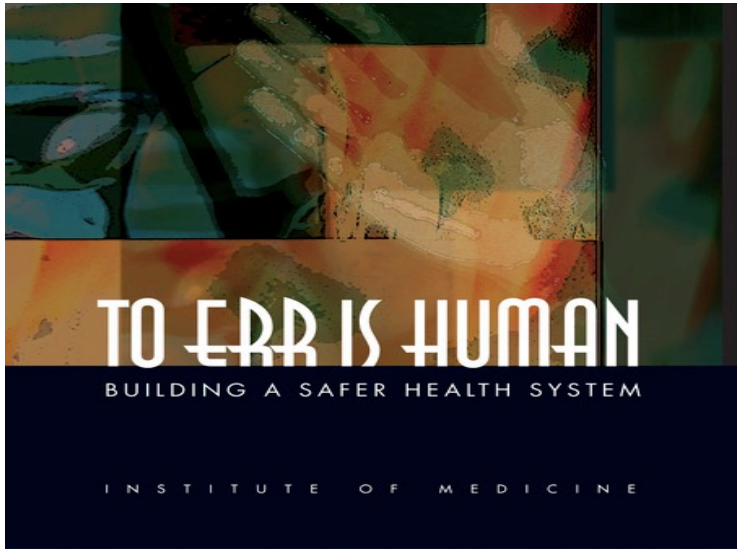
= Avoidable Suffering

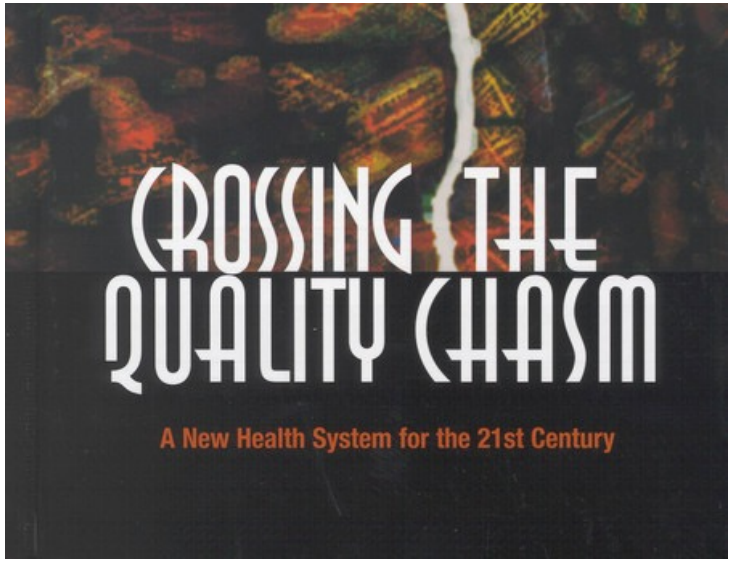
Healthcare is defined as a service….

Don't Harm Me.

Heal Me.

Be Nice to Me.





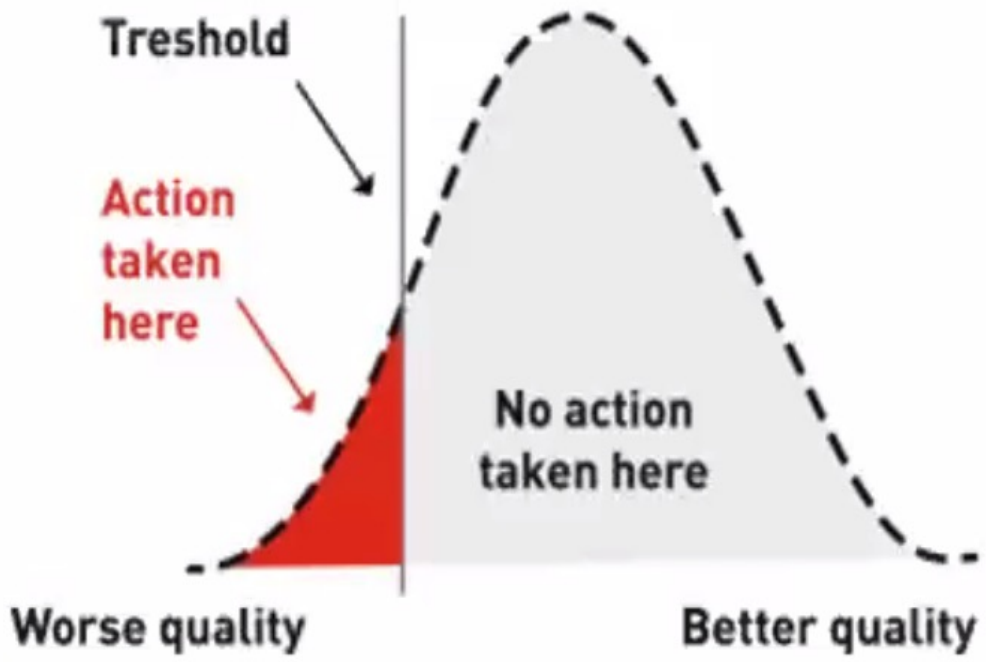
What is quality?

STEEEP:

- Safe
- Timely
- Effective
- Efficient
- Equitable
- Patient-centred

Research on quality: completely different

Quality assurance: passing the bar



Quality improvement: shifting the curve

Source: Rehn and Krüger, 2014

The Three Faces of Performance Measurement

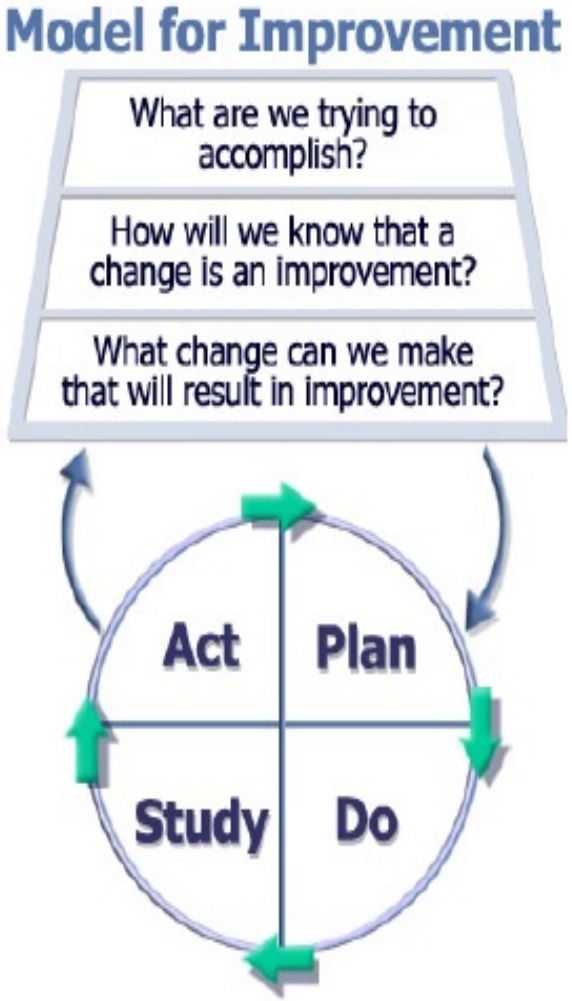
Aspect	Improvement	Accountability (Judgement)	Research
Aim	Improvement of care **(efficiency & effectiveness)**	Comparison, choice, reassurance, motivation for change	New knowledge **(efficacy)**
Methods: • Test Observability	Test observable	No test, evaluate current performance	Test blinded or controlled
• Bias	Accept consistent bias	Measure and adjust to reduce bias	Design to eliminate bias
• Data	**"Just enough" data,** small sequential samples	Obtain 100% of available, relevant data	**"Just in case" data**
• Flexibility of Hypothesis	Flexible hypotheses, changes as learning takes place	No hypothesis	Fixed hypothesis (null hypothesis)
• Testing Strategy	Sequential tests	No tests	One large test
• Determining if a change is an improvement	**Analytic Statistics (statistical process control)** Run & Control charts	No change focus (maybe compute a percent change or rank order the results)	**Enumerative Statistics** (t-test, F-test, chi square, p-values)
• Confidentiality of the data	Data used only by those involved with improvement	Data available for public consumption and review	Research subjects' identities protected

Adapted from: Lief Solberg, Gordon Mosser and Sharon McDonald, *Journal on Quality Improvement,* vol. 23, no. 3, (March 1997), 135-147.

DIAGNOSTIC PROCESS	QUALITY IMPROVEMENT
Presenting complaint	System/process issue
History & physical	Root-cause analysis
Diagnostic tests	Data gathering
Diagnosis	System diagnosis
Treatment	PDSA cycles
Follow-up	Sustainability

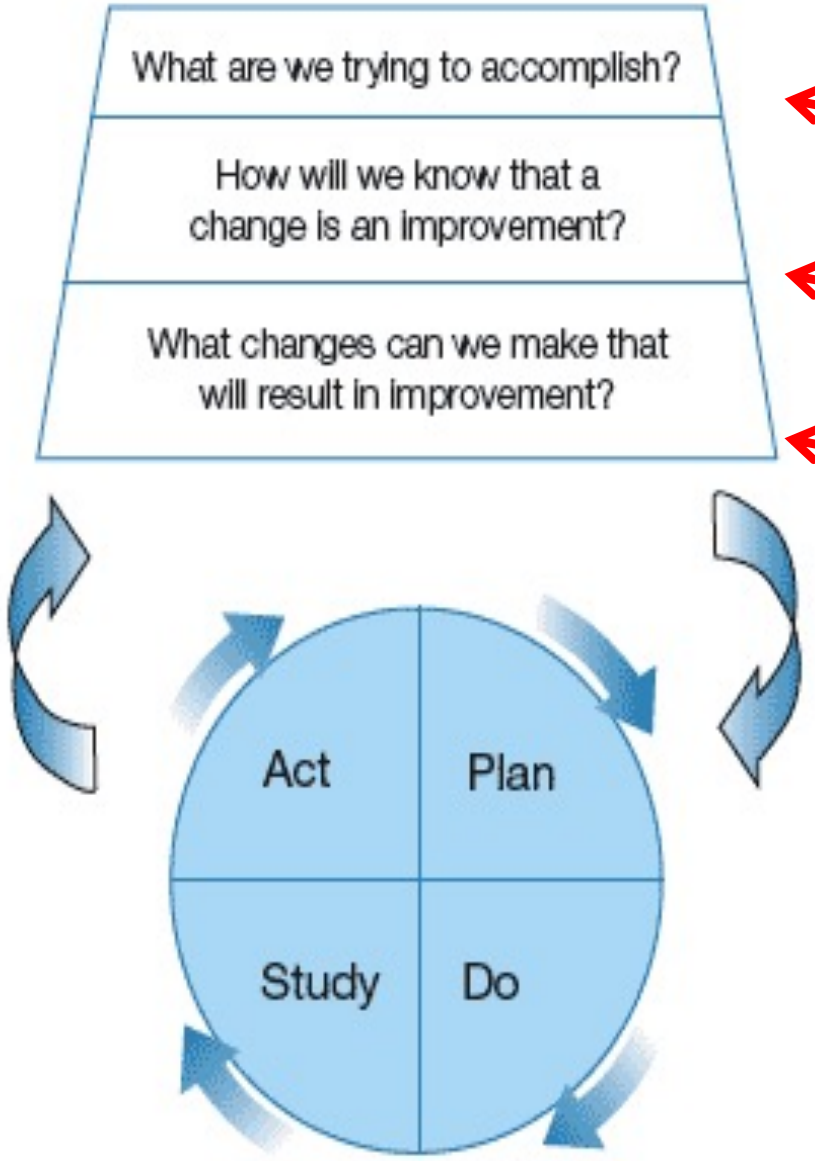
RESEARCH	QUALITY IMPROVEMENT
Focus on ‘what’	Focus on ‘how’
Clinical decisions	Processes of care
On topic of effectiveness	On 6 domains of quality
Fixed hypothesis	Evolving hypotheses with PDSA cycles
Ideal conditions, blinded, unbiased	Real-world conditions, open/transparent, accepting bias
Spread at population-level	Apply local solutions

WHAT ARE QI METHODOLOGIES ?



7 Steps

MODEL FOR IMPROVEMENT



Aim statement

Measures

Change ideas

PDSA cycles

SMART AIM STATEMENT

- **S**PECIFIC
- **M**EASURABLE
- **A**CTIONABLE
- **R**EALISTIC
- **T**IMELY

1.WHAT ?
2.BY HOW MUCH ?
3.WHEN ?

1. **I want to improve the number of patients seen virtually in Hematology clinic.**
2. **I want to improve the number of patients seen virtually in Hematology clinic from the current 30% to 50% by March 2023.**

"Some is not a number, soon is not a time."

– Don Berwick, December 2004, at launch of 100,000 Lives Campaign

MEASUREMENTS

- **OUTCOME MEASURE:**
  - Voice of the Customer
  - Impact on Patients / staff /Population
- **PROCESS MEASURE:**
  - Voice of the System
  - What is being done while receiving / providing care
- **BALANCING MEASURE:**
  - What else changed ?
  - Unintended consequences

OUTCOME MEASURE:

Improvement in virtual clinic numbers by 50%.

PROCESS MEASURE:

- No. of appointments booked
- No. of patients contacted prior to appointment

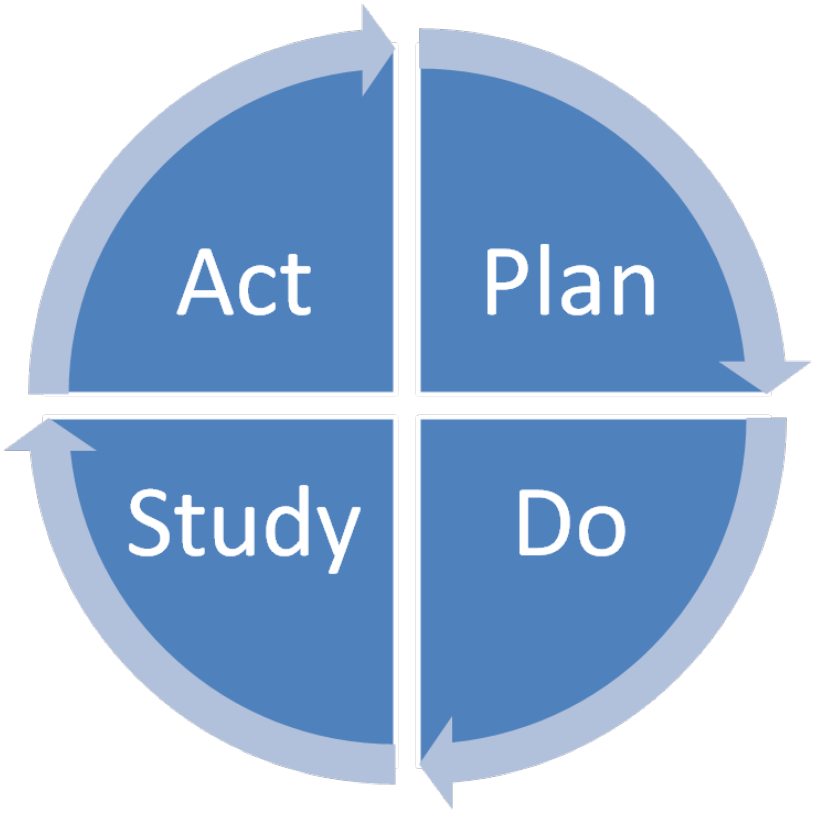
BALANCING MEASURE:

-Time spent for each virtual care evaluation

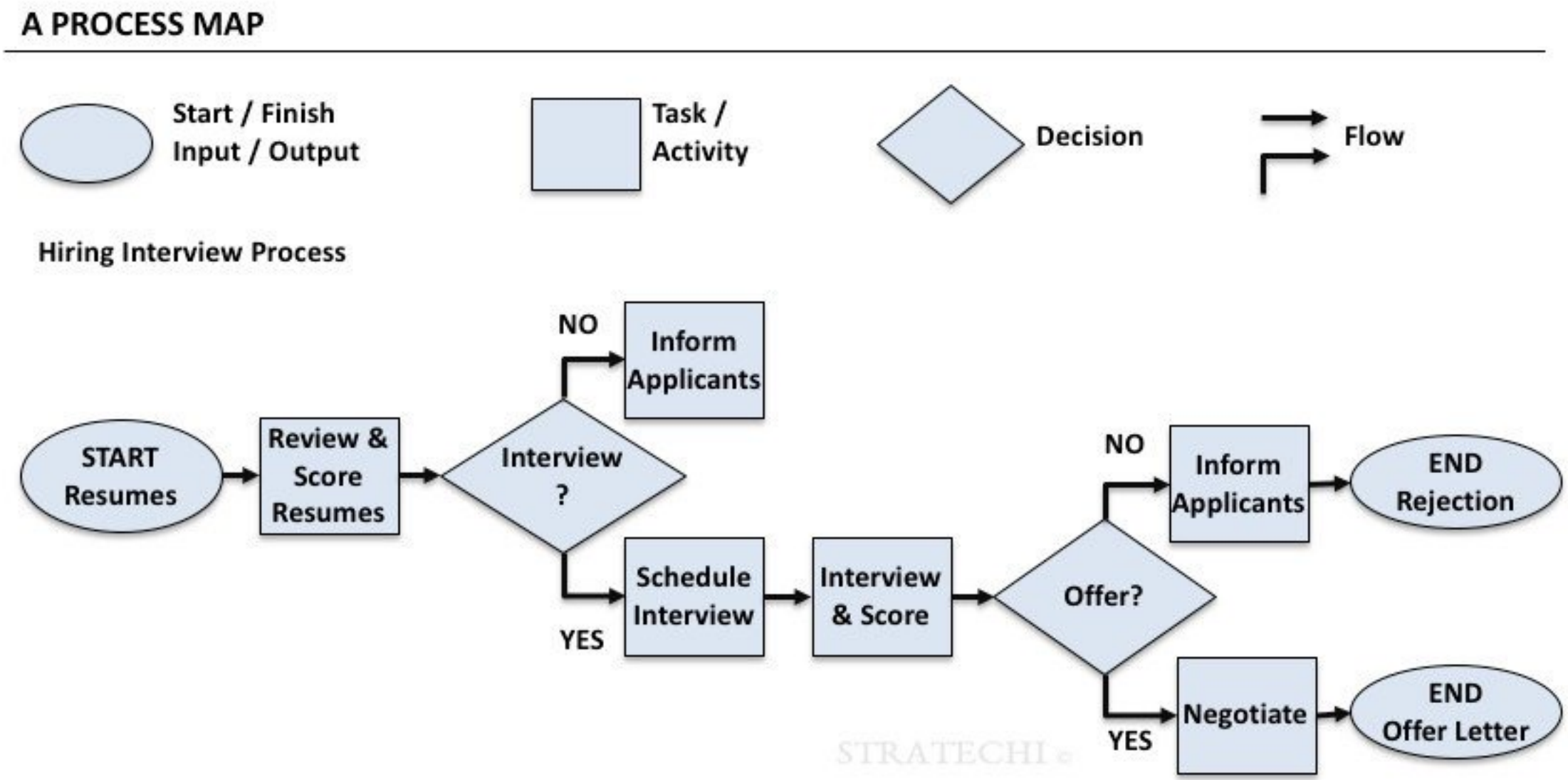
-Lab tests ordered prior and post appointment

PDSA CYCLE

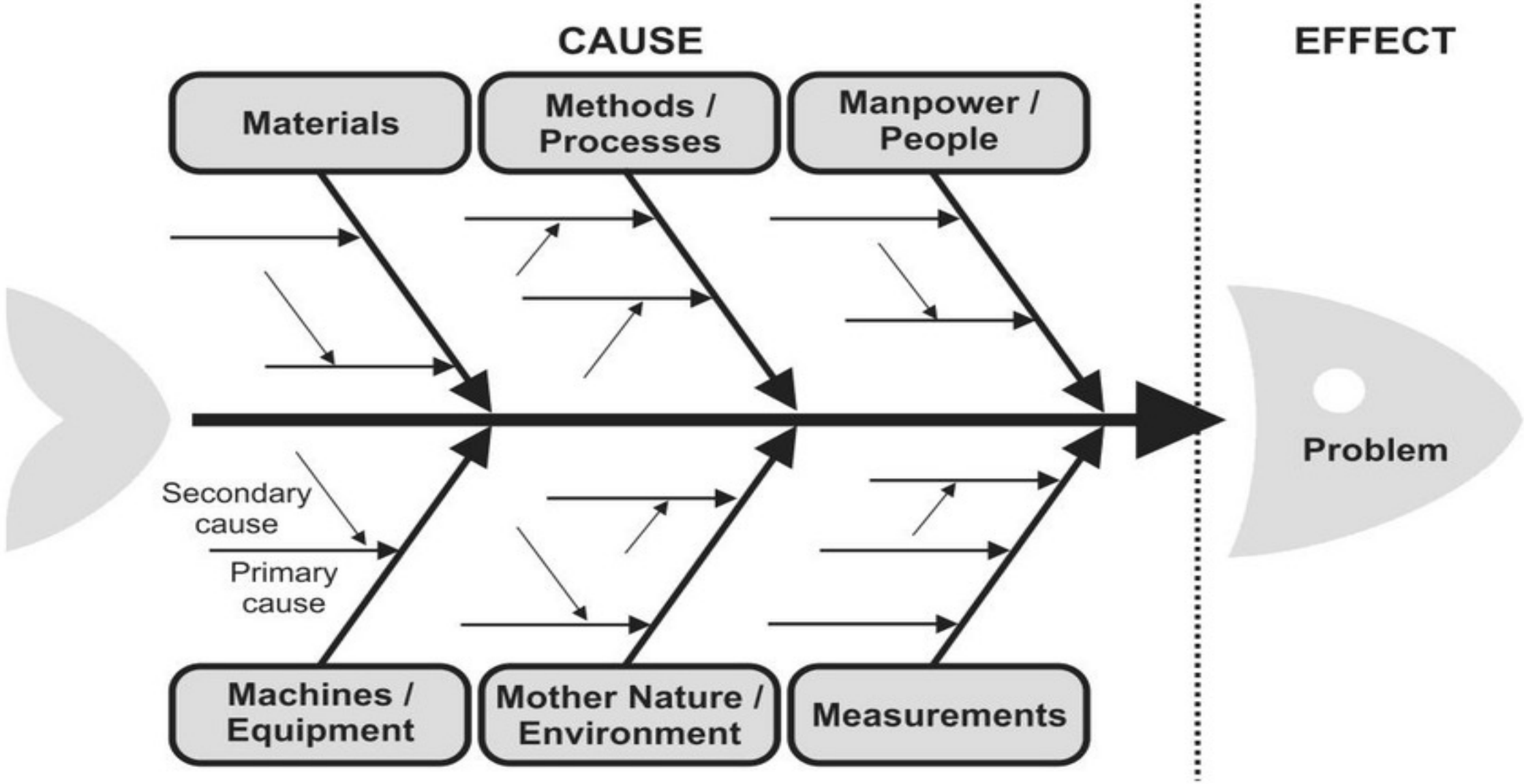
- P: Formulating a hypothesis
- D: Collecting data to test this hypothesis
- S: Analyze and interpret results
- A: Make inferences to iterate the hypothesis

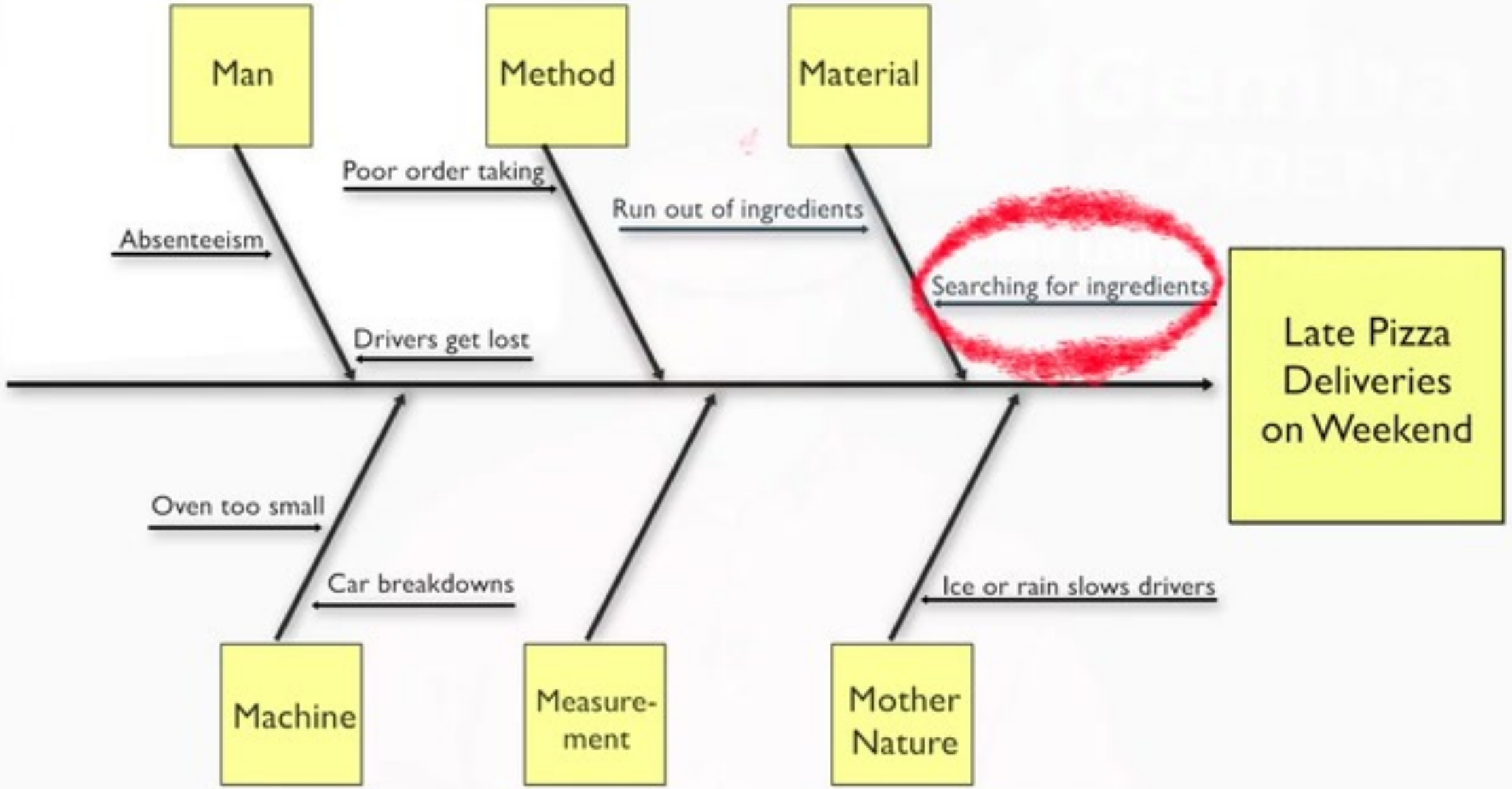


PROCESS MAP


A PROCESS MAP
Start / Finish
Input / Output
Task /
Activity
Decision
Flow
Hiring Interview Process
START
Resumes
Review &
Score
Resumes
Interview
?
NO
Inform
Applicants
YES
Schedule
Interview
Interview
& Score
Offer?
NO
Inform
Applicants
END
Rejection
YES
Negotiate
END
Offer Letter

FISHBONE (ISHIKAWA) DIAGRAM

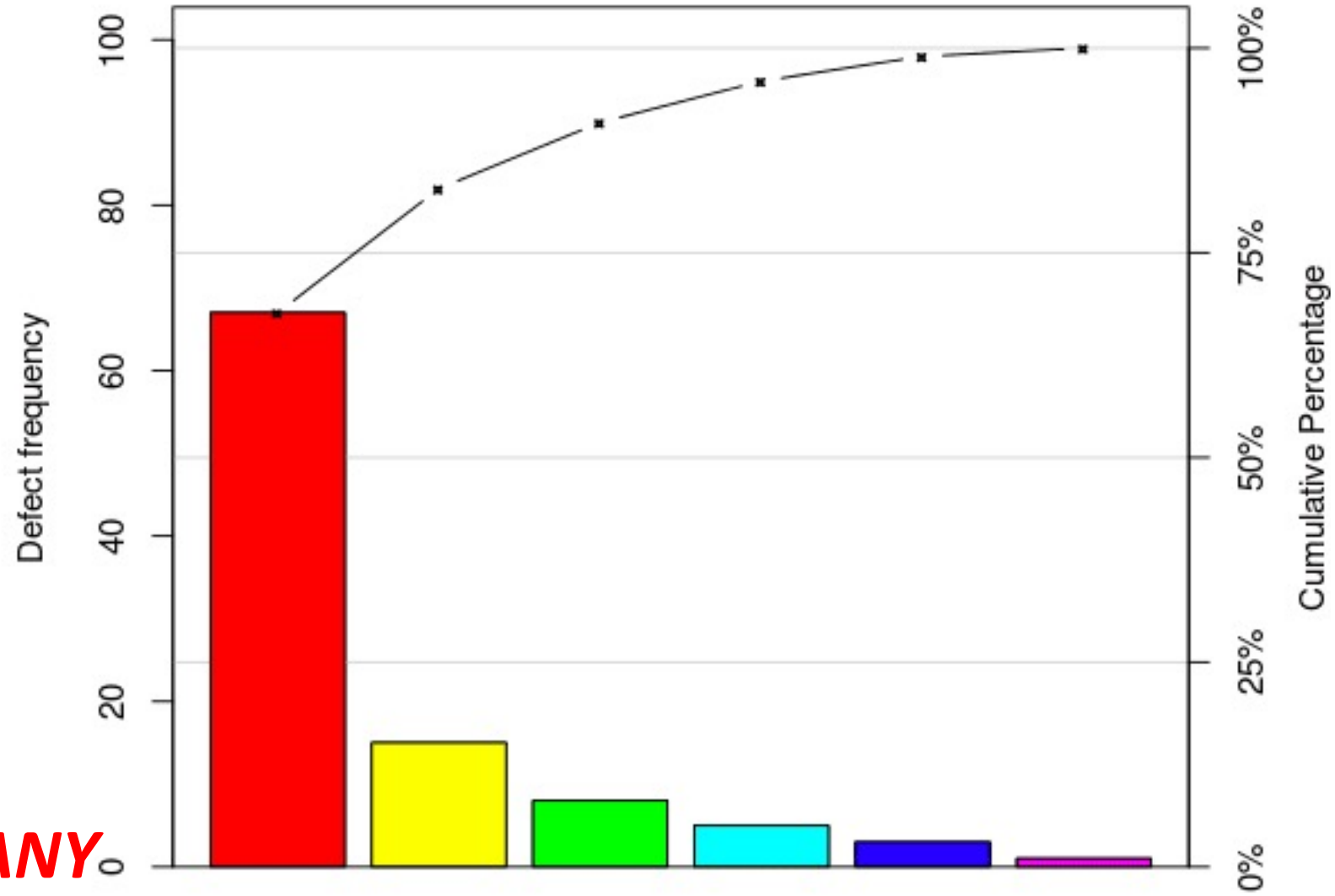



Man
Method
Material
Poor order taking
Run out of ingredients
Absenteeism
Searching for ingredients
Drivers get lost
Late Pizza Deliveries on Weekend
Oven too small
Car breakdowns
Ice or rain slows drivers
Machine
Measure-ment
Mother Nature

PARETO DIAGRAM

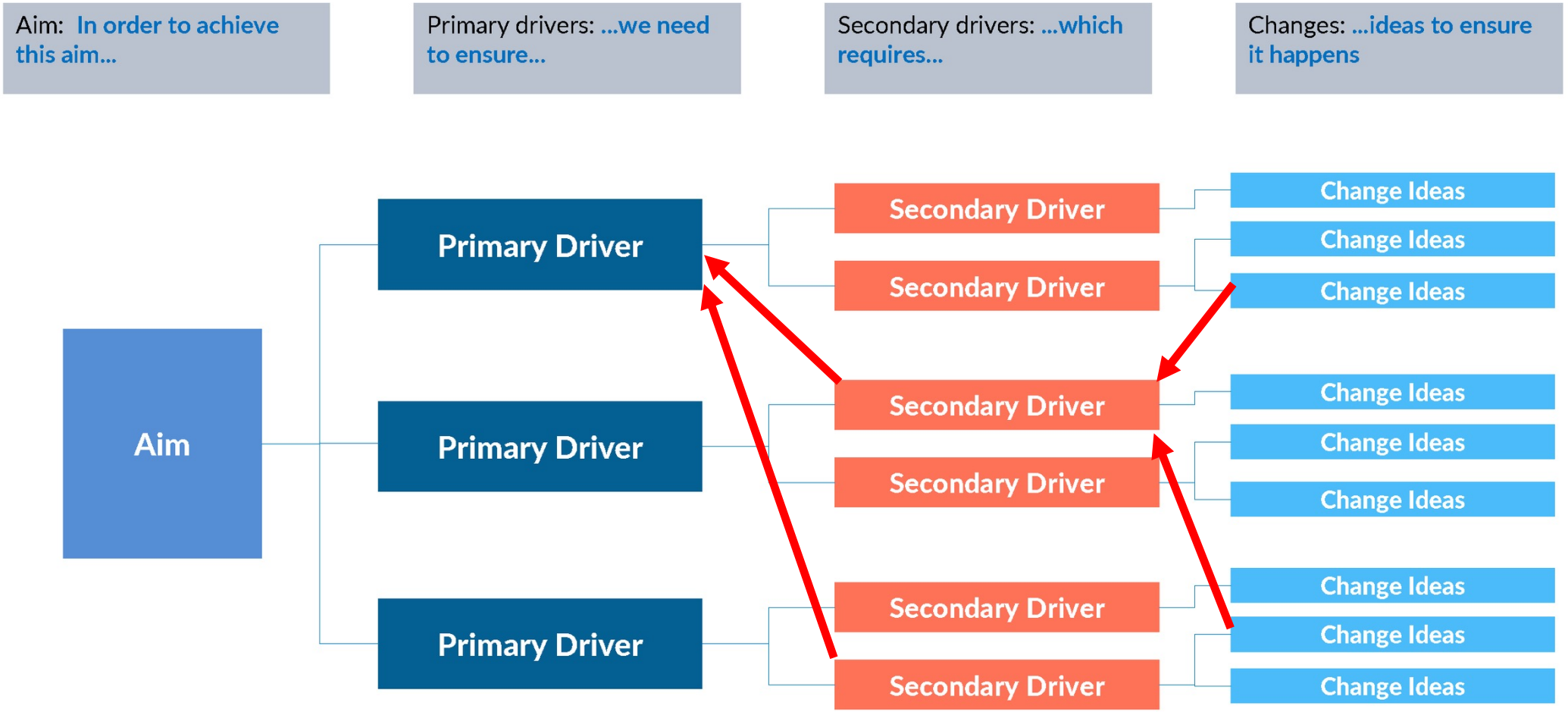
Principle:

- Approximately **80%** of the effects come from **20%** of the causes



VITAL FEW VS. TRIVIAL MANY

DRIVER DIAGRAM



DATA AND MEASUREMENT IN QI

- **Enumerative Vs. Analytic**

- **Types of Chart**

  RUN Chart

  CONTROL Chart

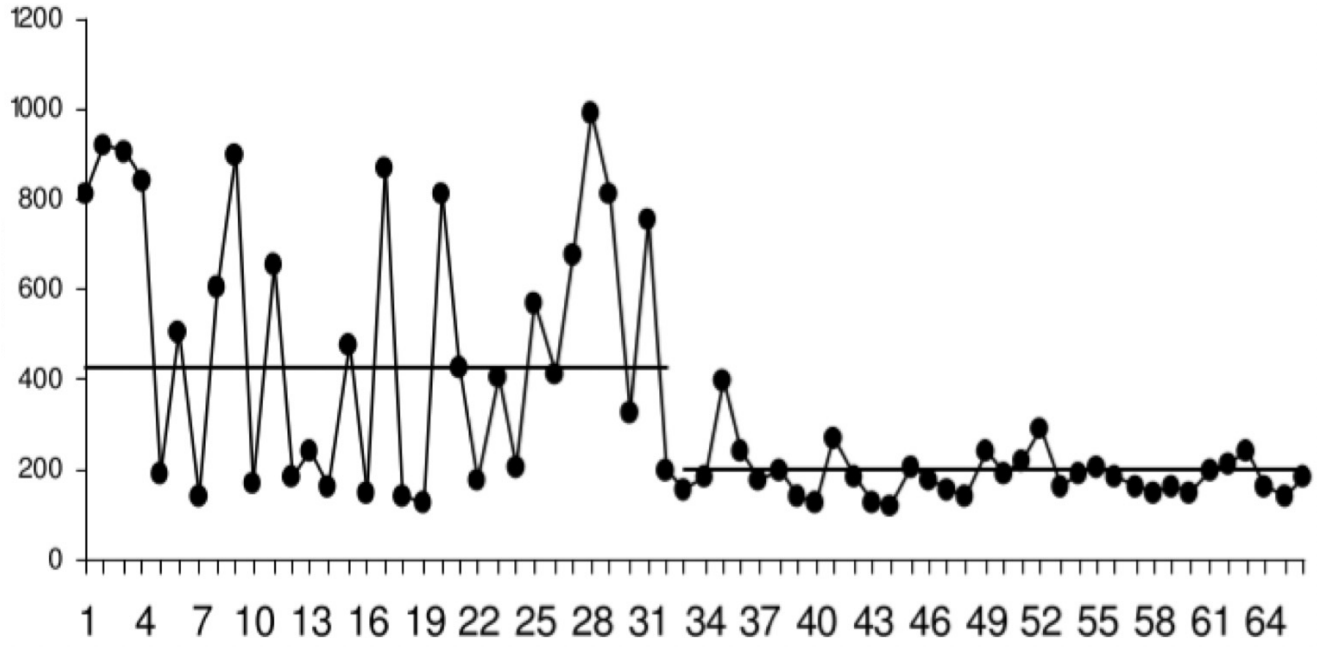
- **Basic Principles:**

  - Data Over Time

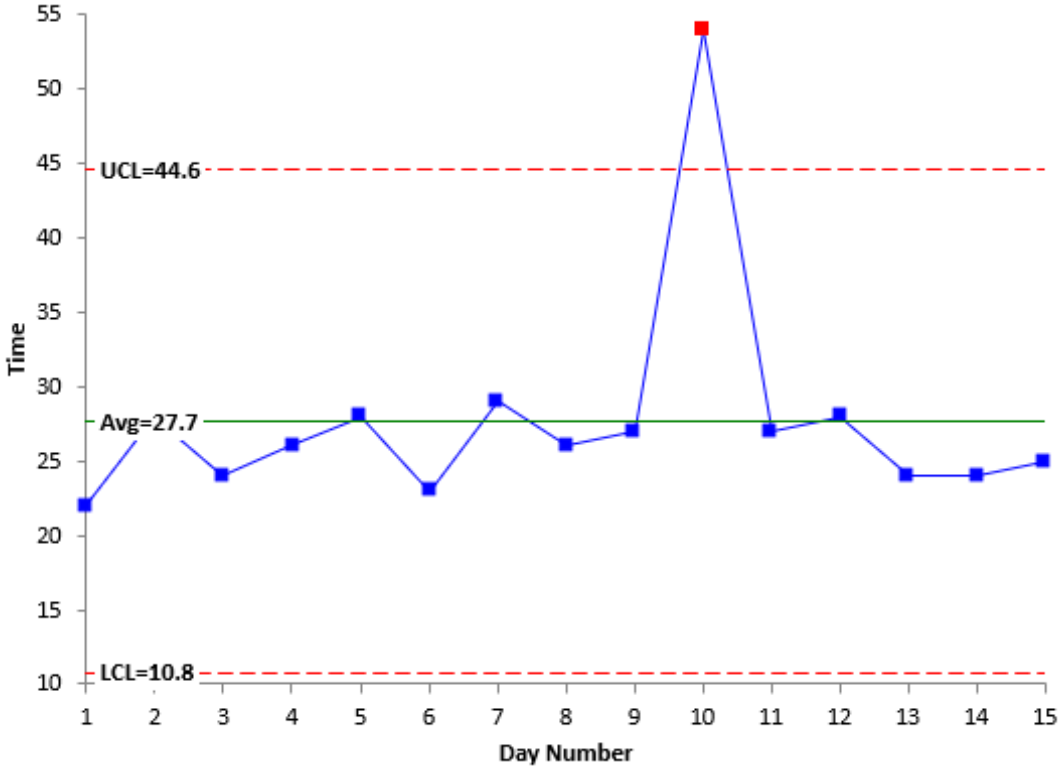
  - To differentiate Common Cause (‘Noise’) Vs. Special Cause (‘Signal’)

  - Analysis before and after intervention

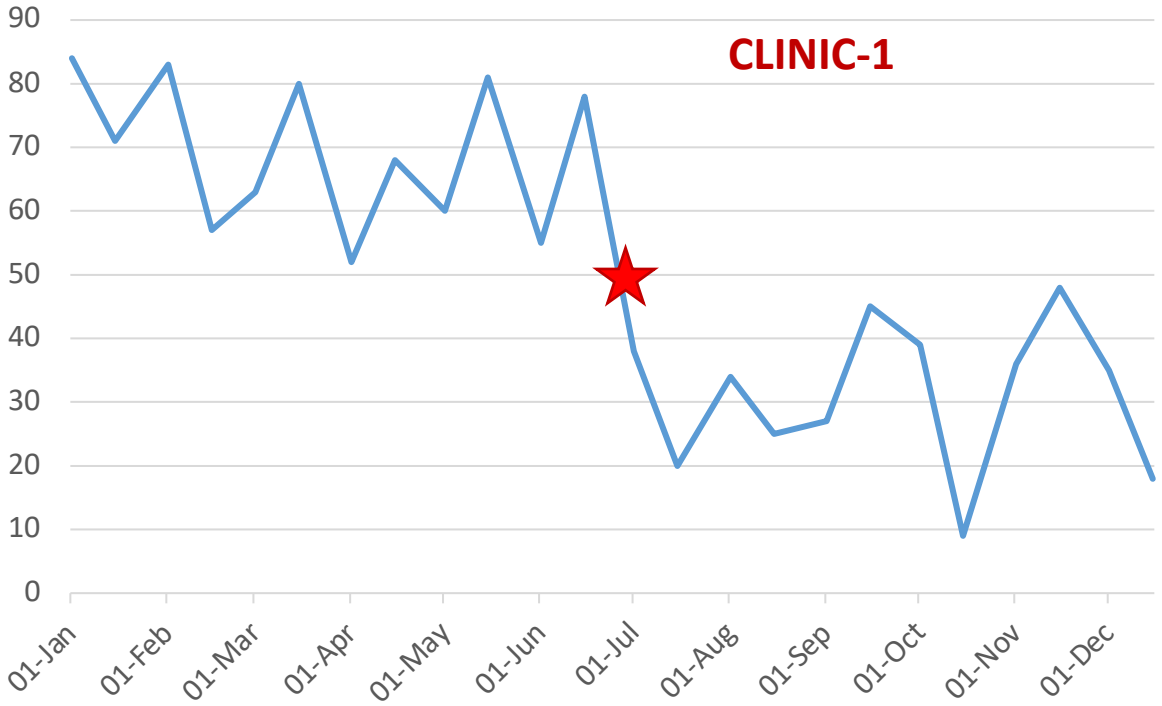
RUN CHART

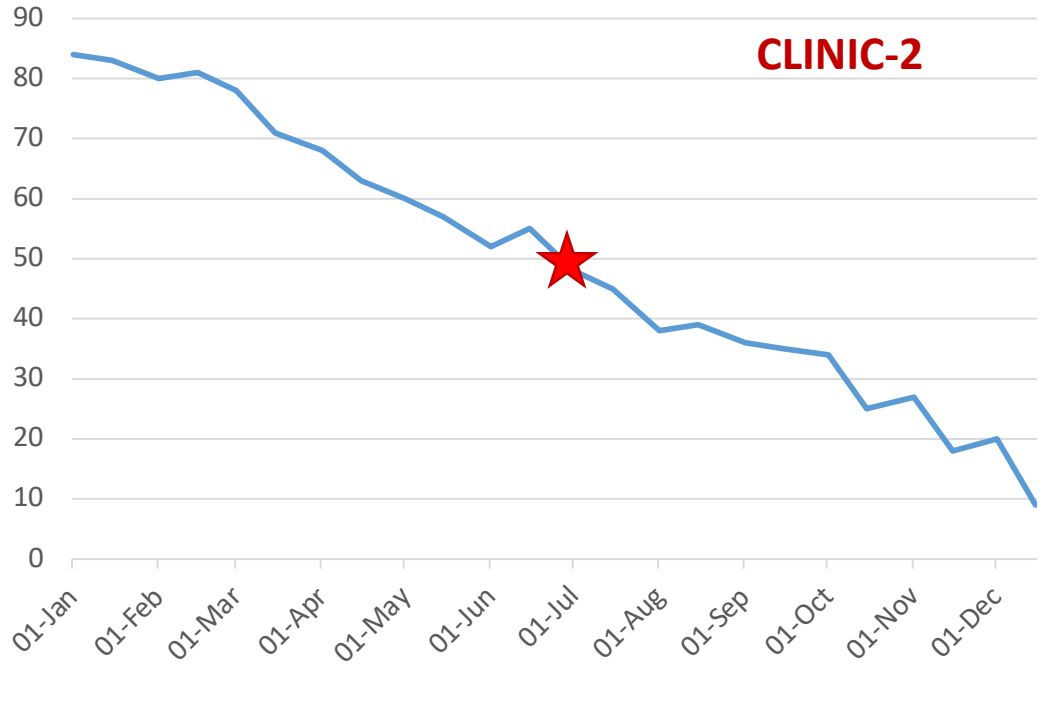


CONTROL CHART



WAIT TIME TO SEE THE PHYSICIAN (IN MINUTES)	CLINIC 1	CLINIC 2	CLINIC 3
	50	55	45
	49	52	55
	60	58	58
	63	57	52
	57	56	60
	52	53	54
	55	58	59
	..	..	..
	..	..	..
MEAN BEFORE	55	55	55
SD	10	10	10
MEAN AFTER	33	33	33
SD	10	10	10
P value	< 0.01	< 0.01	< 0.01
MEDIAN	52	52	52

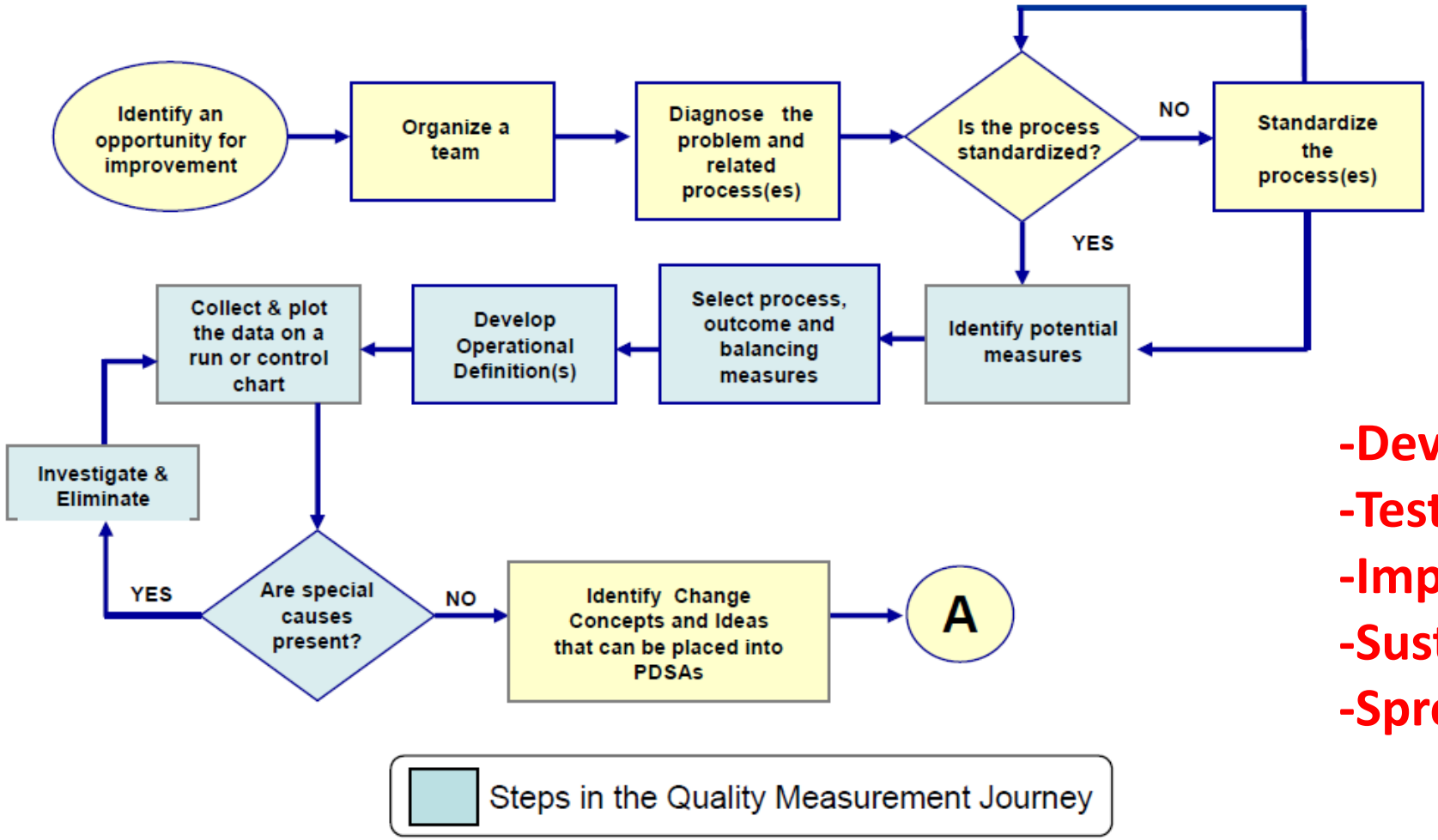

CLINIC-1
90
80
70
60
50
40
30
20
10
0
01-Jan
01-Feb
01-Mar
01-Apr
01-May
01-Jun
01-Jul
01-Aug
01-Sep
01-Oct
01-Nov
01-Dec


CLINIC-2
90
80
70
60
50
40
30
20
10
0
01-Jan
01-Feb
01-Mar
01-Apr
01-May
01-Jun
01-Jul
01-Aug
01-Sep
01-Oct
01-Nov
01-Dec


CLINIC-3
90
80
70
60
50
40
30
20
10
0
01-Jan
01-Feb
01-Mar
01-Apr
01-May
01-Jun
01-Jul
01-Aug
01-Sep
01-Oct
01-Nov
01-Dec

The Quality Improvement Journey

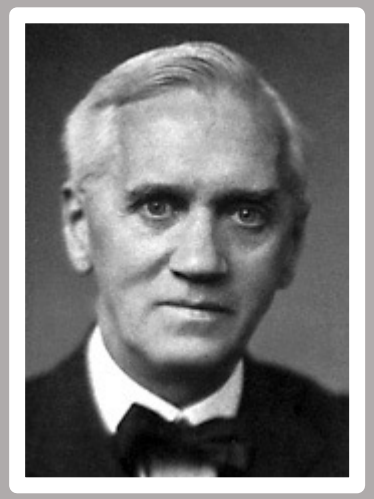
Source: Carey, R. and Lloyd, R. *Measuring Quality Improvement in Healthcare: A Guide to Statistical Process Control Applications.* ASQ Press, Milwaukee, WI, 2001.



-Develop
-Test
-Implement
-Sustain
-Spread

THE STORY OF PENICILLIN……

- **The Nobel Prize for Medicine was awarded in 1945 to:**

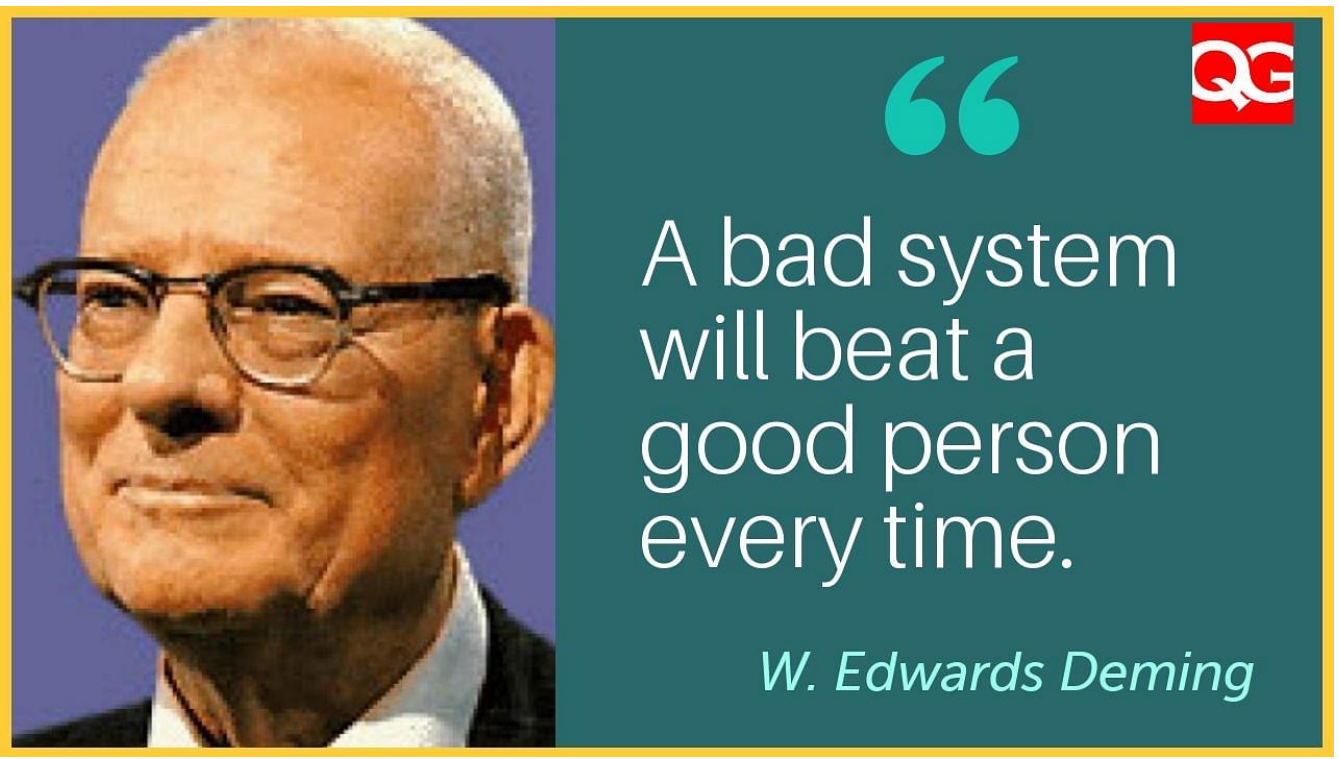


Sir Alexander Fleming

Ernst B. Chain

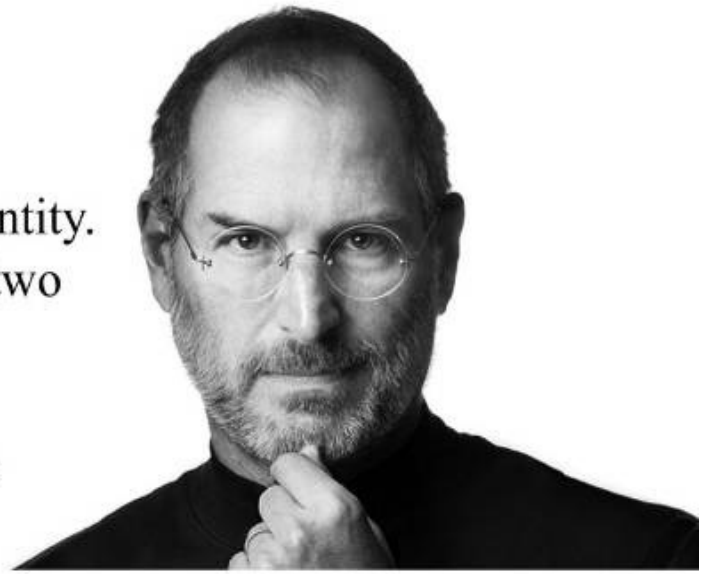
Sir Howard Florey

- **Sir Henry Harris at the Florey Centenary lecture (1998):**
  - ***"Without Fleming, no Chain;***
  - ***without Chain, no Florey;***
  - ***without Florey, no Heatley;***
  - ***without Heatley, no penicillin."***
- **In other words:**
  - ***Without Fleming, no innovation;***
  - ***without Chain and Florey, no testing;***
  - ***without Heatley, no wide scale use of penicillin.***



Quality is more important than quantity. One home run is much better than two doubles.

Steve Jobs



Improvement Tip: Take the Journey to "Jiseki"

- **Stage ONE:** Data are Wrong
- **Stage TWO:** Data are Right; But it is not a Problem
- **Stage THREE:** Data are Right; there is a Problem; But it is not my Problem. ***Taseki***
- **Stage FOUR:** Data are Right; there is a Problem; But it is my Problem. ***Jiseki***

Don Berwick, MD

CONCLUSION – PART-II

- **Start Small**
- **Have an Aim, Measure and Ideas**
- **Run multiple PDSA cycle**
- **1st TEST and then Implement**

REMEMBER: Every System is Perfectly Designed To Get The Results It Gets !

THANK YOU