

Teaching Patient Safety

Quality and Safety Educators Academy
February 23, 2012

Anjala Tess MD
Jennifer Myers MD

Our Goals

By the end of this session, you will have:

1. A framework for thinking about medical errors
2. A new vocabulary to teach students and residents about patient safety
3. Examples of teaching tools and activities that can be used to teach patient safety skills to trainees.
4. Tips for dealing with medical errors that involve trainees

Case

- Phone call from the hospital QI department about a troublesome adverse event involving the residents
- Patient one week s/p knee replacement, admitted with a new pulmonary embolism.
- Admitting intern wrote orders in the Computer Physician Order Entry (CPOE) system.



Pharmacy	Date	Status	Disc/Stop
lisinopril - tablet 10 mg oral Daily	04-May-2010 Routine	Active	02-Aug-2010
heparin injection - - 5000 Unit(s) subcutaneous Every 8 Hours	04-May-2010 Routine	Active	02-Aug-2010
calcium carbonate-vitamin D - - 500 mg- 200 Units tablet (Known as DYST-CAL-D 500 MG -) 1 tablet(s) oral Daily with breakfast & dinner	04-May-2010 Routine	Active	02-Aug-2010
psk, ramelteon - capsule (Known as RESTORIL -) HIGH-ALERT MEDICATION 7.5 mg oral Once PRN insomnia Stop After: 1 Times	04-May-2010 08:13	Completed/Expired	04-May-2010 08:13
lisinopril - tablet 5 mg oral Daily	03-May-2010 Routine	Discontinued	04-May-2010 08:13
docusate sodium - capsule (Known as COLACE -) 100 mg oral 2 times per day	01-May-2010 Routine	Active	30-Jul-2010
psk, senna concentrate - - 8.6 mg per tablet tablet (Known as SENOKOT -) 2 tablet(s) oral Every 12 Hours PRN constipation	01-May-2010 Routine	Active	30-Jul-2010
acetaminophen - tablet (Known as TYLENOL -) 650 mg oral Every 8 Hours	01-May-2010 Routine	Active	30-Jul-2010
lidocaine patch 5% - film (Known as LIDODERM PATCH -) 1 patch(es) topical Daily Apply once for up to 12 hours within a 24 hour period. Maximum of 3 patches. 12 hours on, 12 hours off. Apply to L flank.	01-May-2010 Routine	Active	30-Jul-2010
calcium carbonate-vitamin D - - 500 mg- 200 Units tablet (Known as DYST-CAL-D 500 MG -) 1 tablet(s) oral Daily with breakfast	30-Apr-2010 Routine	Discontinued	04-May-2010 08:13
bacitracin topical - ointment 1 application(s) topical 2 times per day to RILE	30-Apr-2010 Routine	Active	29-Jul-2010
acetaminophen - tablet (Known as TYLENOL -) 650 mg oral Once. Stop After: 1 Times	30-Apr-2010 STAT	Completed/Expired	30-Apr-2010 08:13 (15 minutes)
psk, acetaminophen - tablet (Known as TYLENOL -)	30-Apr-2010 Routine	Discontinued	01-May-2010 11:13

Case Continued

- Following day → Knee acutely swollen, drop in Hct, high PTT and orthopedist concerned about hemarthrosis
- On review, team recognized that the orders were for 2X the correct dose of heparin (load and gtt)
- Likely hemarthrosis due to heparin overdose



Patient diagnosed with knee hematoma



How could this have happened?

Definitions

- Is there a difference??
 - Adverse Event
 - Near miss
 - Medical Error

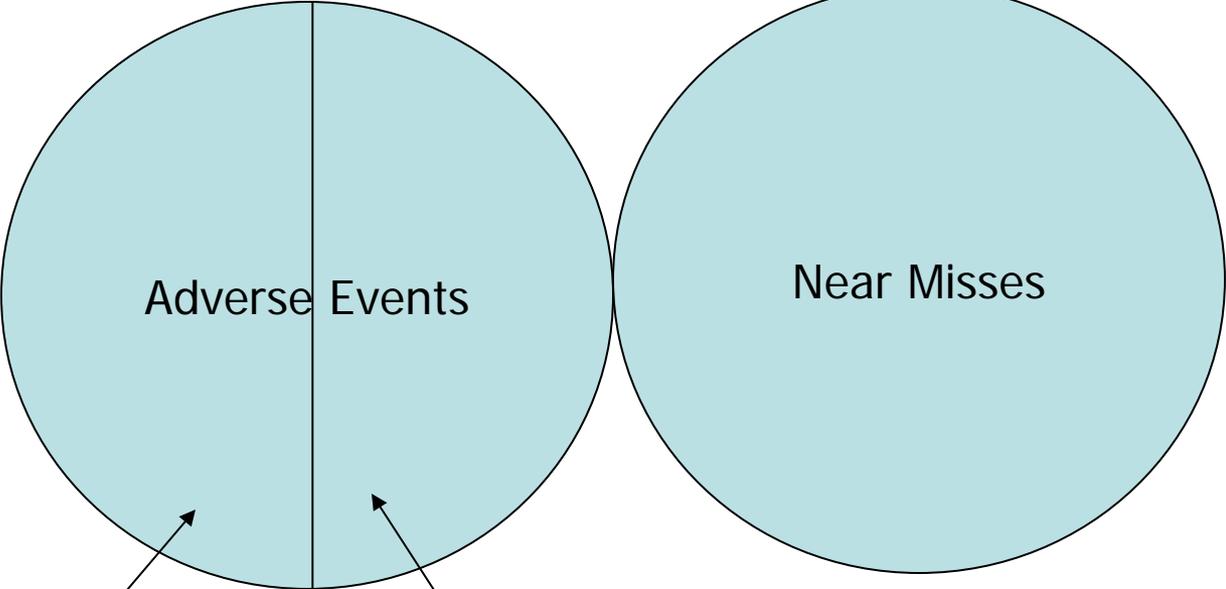
Adverse events

- Anytime a patient suffers a negative outcome from an interaction with the healthcare system
- Adverse events can both be preventable and unpreventable.
- Examples of preventable adverse events include
 - Medication errors
 - Diagnostic errors
 - Procedural errors.

Near Miss

- An event or situation that did not produce patient injury, but only because of chance.
- Can be due to patient factor or can be “caught” by system
- Close call or near “hit”

Medical Error

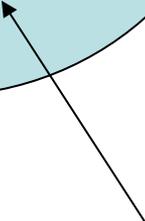
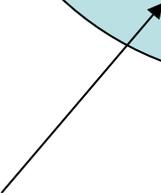


Adverse Events

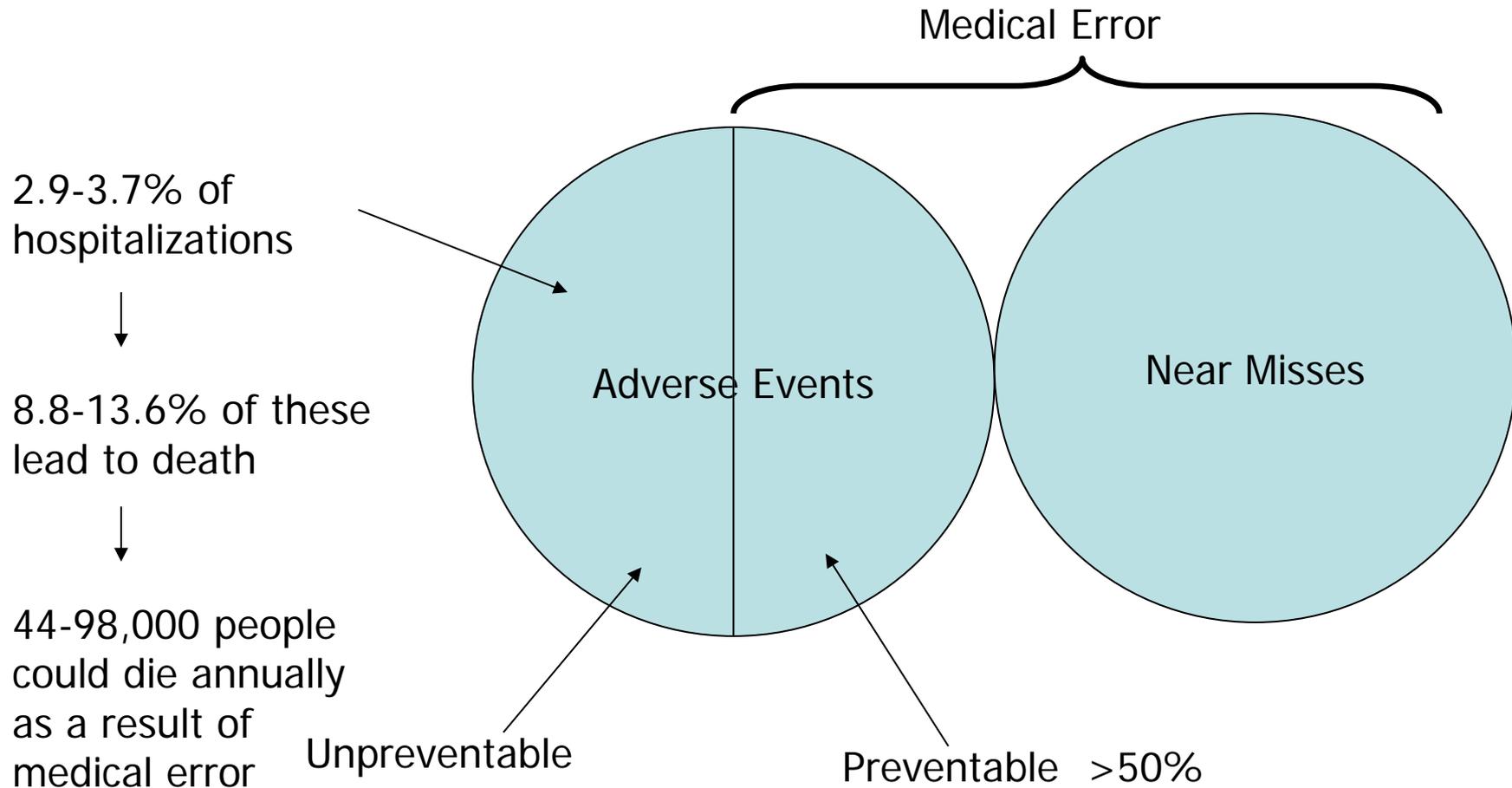
Near Misses

Unpreventable

Preventable



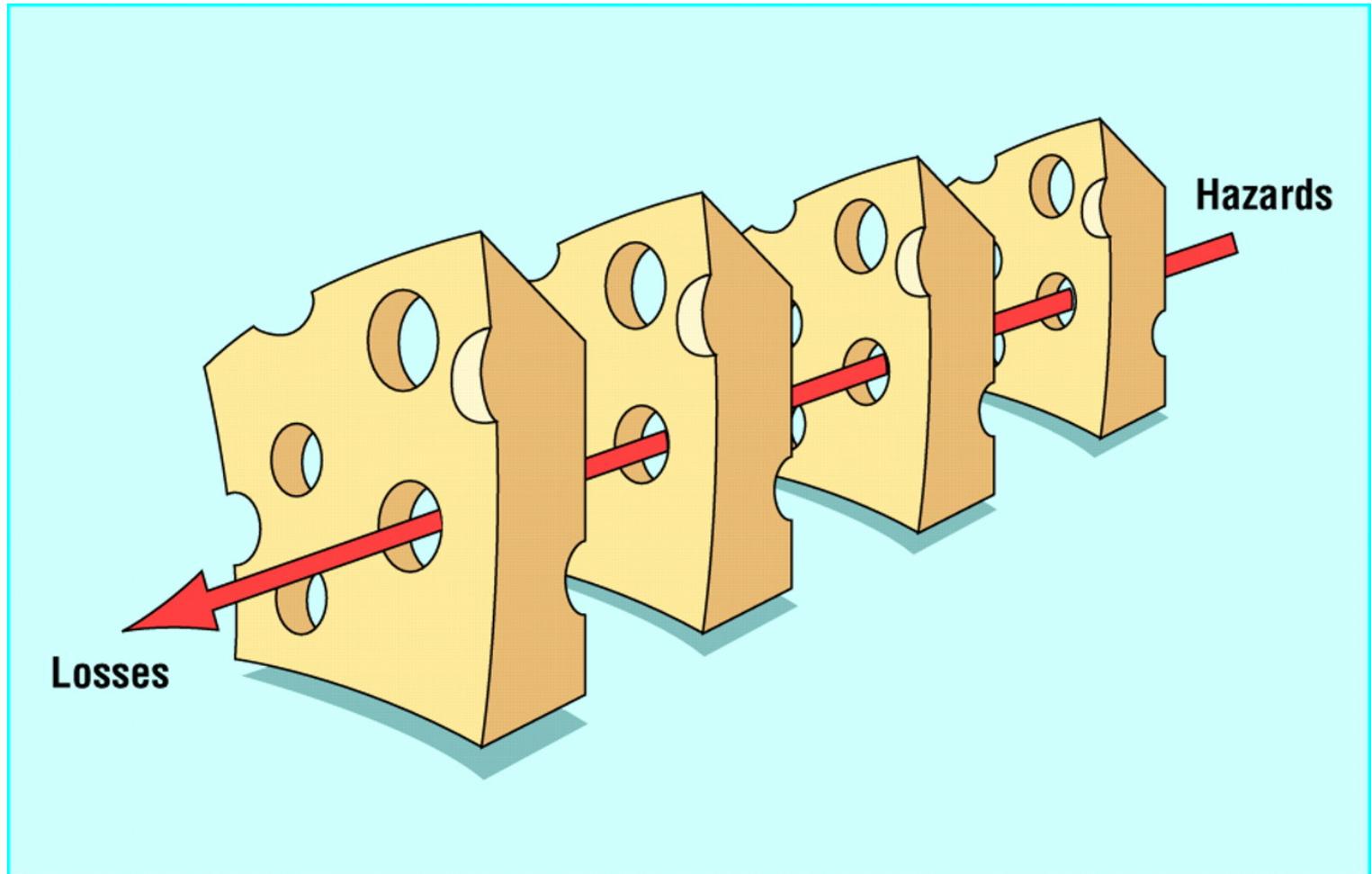
The numbers....



Harvard medical practice study, 1991

Utah and Colorado , 1992

Swiss Cheese Model of Error



Reason, J. *BMJ* 2000;320:768-770

Definitions

- Adverse Event Review or Root Cause Analysis
 - Process for identifying the multiple contributing factors that underlie adverse events or near misses
 - “Contributing factors analysis” or “systems analysis” may be better
 - 3 Questions
 - What happened?
 - Why did it happen?
 - How can we prevent it from happening again?

Rationale – why do this?

- The reporting and analysis of adverse events are crucial to redesigning safer systems.
- Easy to miss the point
 - Blame the individual
 - Draw the wrong conclusion
- Systematic approach
 - Takes you from the sharp end (the individuals) and takes you up to the blunt end (the organizational processes)

Event Analysis

- Decision to Review
- Select People and Gather Data
- Determine Incident Chronology
- Identify Care Delivery Problems
- Identify Contributory Factors
- Making Recommendations & Developing an Action Plan

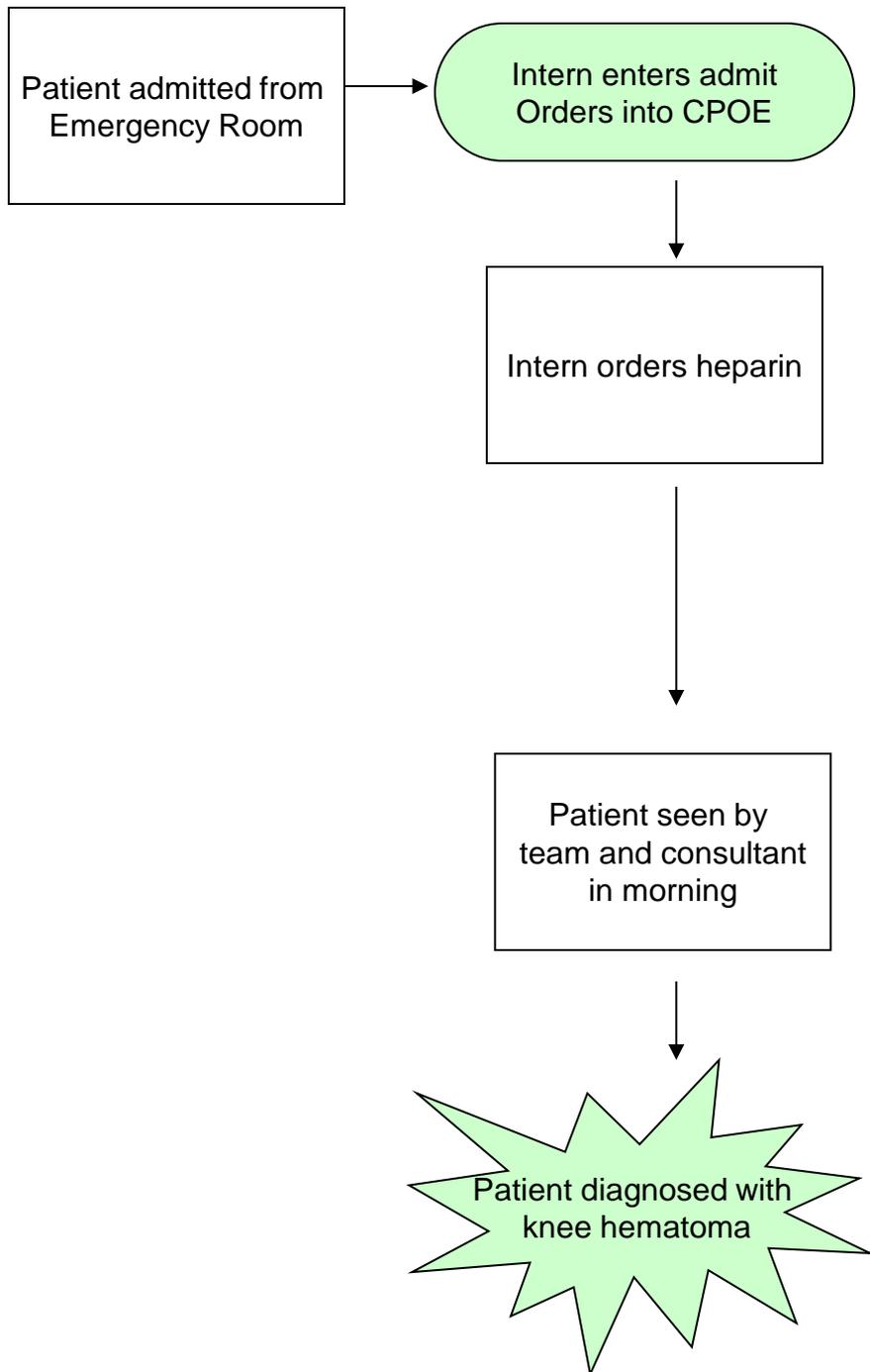


Back to the Case

- Decision to Review
 - Patient safety officer
- Select People and Gather Data
 - Team vs. interviews
 - Charts, orders, patient data, process data

Determine Incident Chronology

- Flowchart
- Lists of events
- Time points



What do we know so far?

Interview with intern:

“I opened the POE screen and filled out the computer protocol using her weight 220 lbs and my expected goal PTT of 60-90. I handed the printed sheet to the nurse to hang the drip and left to go admit the two other patients who were waiting for me. I was so busy. These long shifts can be crazy.”

Answer

SMITH, SALLY, 1327892

DOB 3/26/58

LOCATION: CC6

SERVICE: MED

For weight based algorithm fill in the information and click OK to enter order.

Order Type: Renewal
 New Order

Diagnosis:

Weight:

200	kgs	▼
	kgs	
	lbs	

Entered kgs instead of lbs

OK

Back

Cancel

Follow-up interview with intern:

“Why did I click on kgs instead of lbs? Well I had just finished an ICU rotation and was pretty tired that day. I was also interrupted while typing the order when my pager went off for the other two admissions. Looking back, I guess I was distracted.

“Also now that I think back, when you look at the computer screen to order the drug and enter the weight, the way you pick lbs or kgs is in a drop down and it is easy to click on one when you meant the other.

Human factors:
Fatigue
Distraction
Task overload

MD Slip
in ordering

Intern enters admit
Orders into CPOE



Intern orders heparin



Patient diagnosed with
knee hematoma

Other
frontline
providers?

Interview with pharmacist

“I was new to the hospital when this happened. When I got the order I noted the bolus was too high and that the rate was well beyond what I have usually done. I tried to reach the resident but couldn’t reach him – never called back. I hadn’t been told how to get a hold of the floor staff. So I left a sticker on top of the bag for the RN to call the doctor.

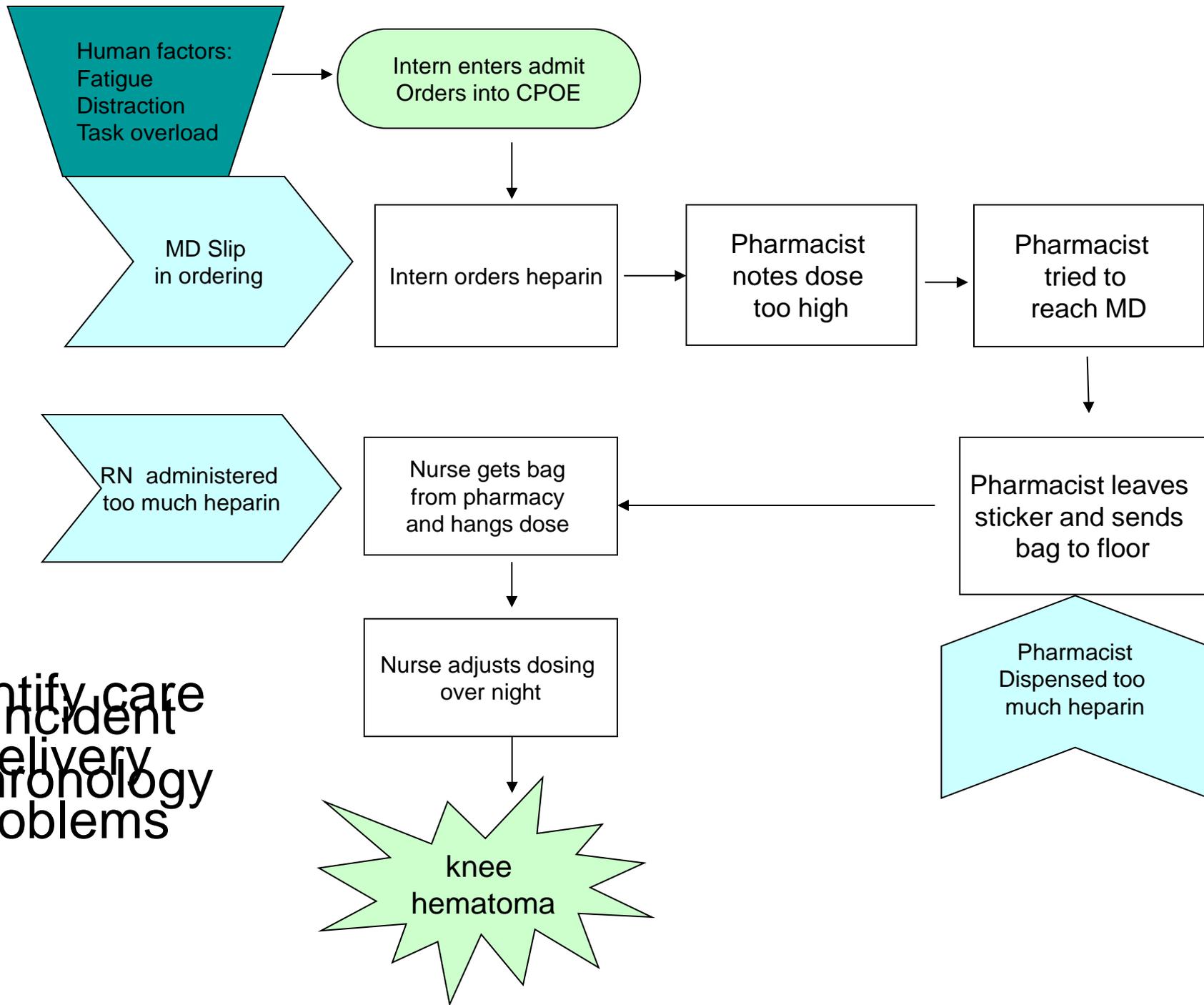
“I heard the next day she never saw the sticker and ran the heparin at the higher dose.”

Interview with RN

“The heparin bag was brought over by transport. I calculated the rate and administered the drip per the protocol.

Overnight the PTT's were really high. I adjusted the dose down twice I was surprised to find out later it was too high but I wouldn't have known – again, we don't use heparin here that often.

It has been a while since I have given it or had training as well.”

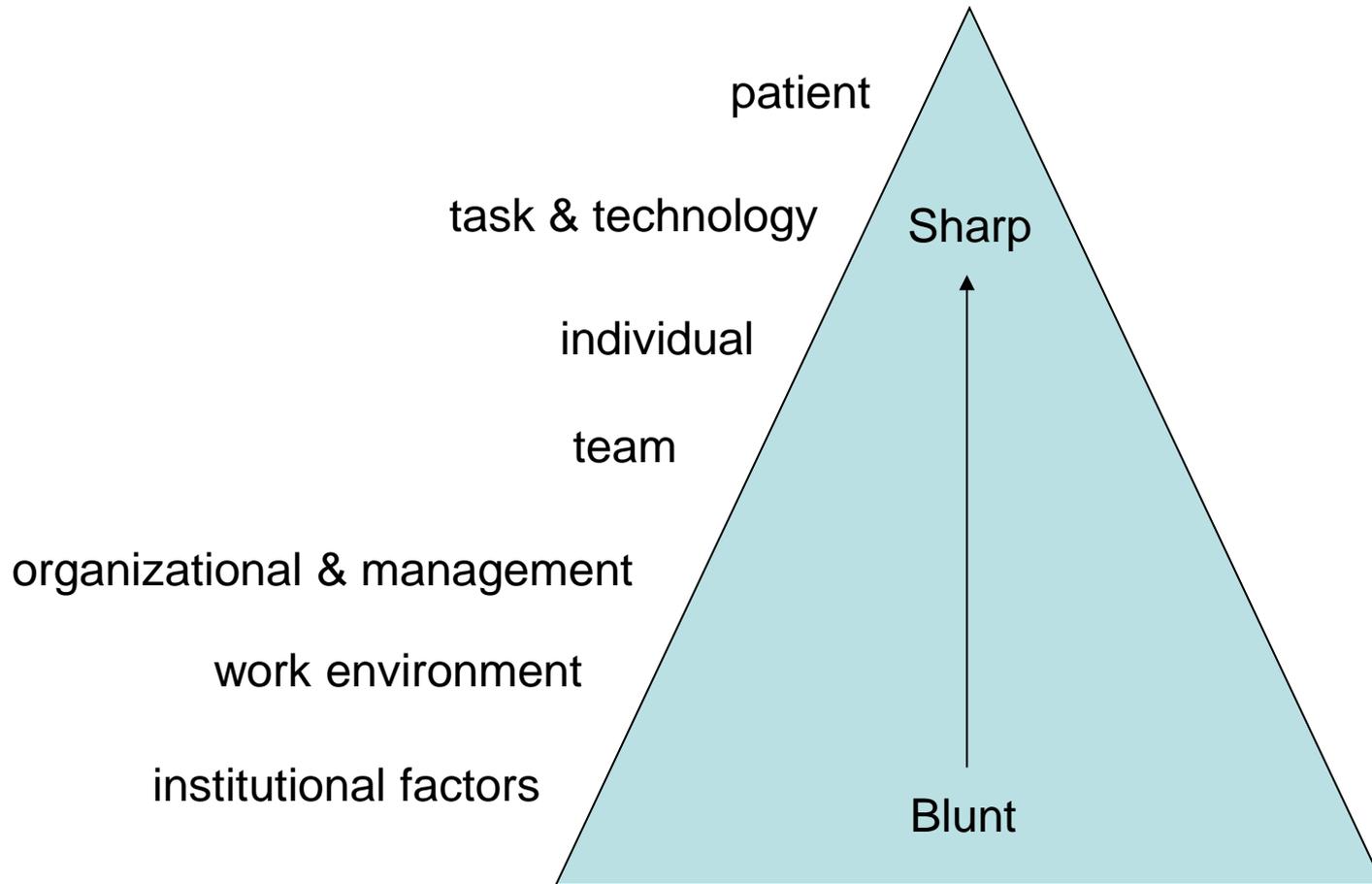


Identify care
Incident
delivery
chronology
problems

System (latent) failures

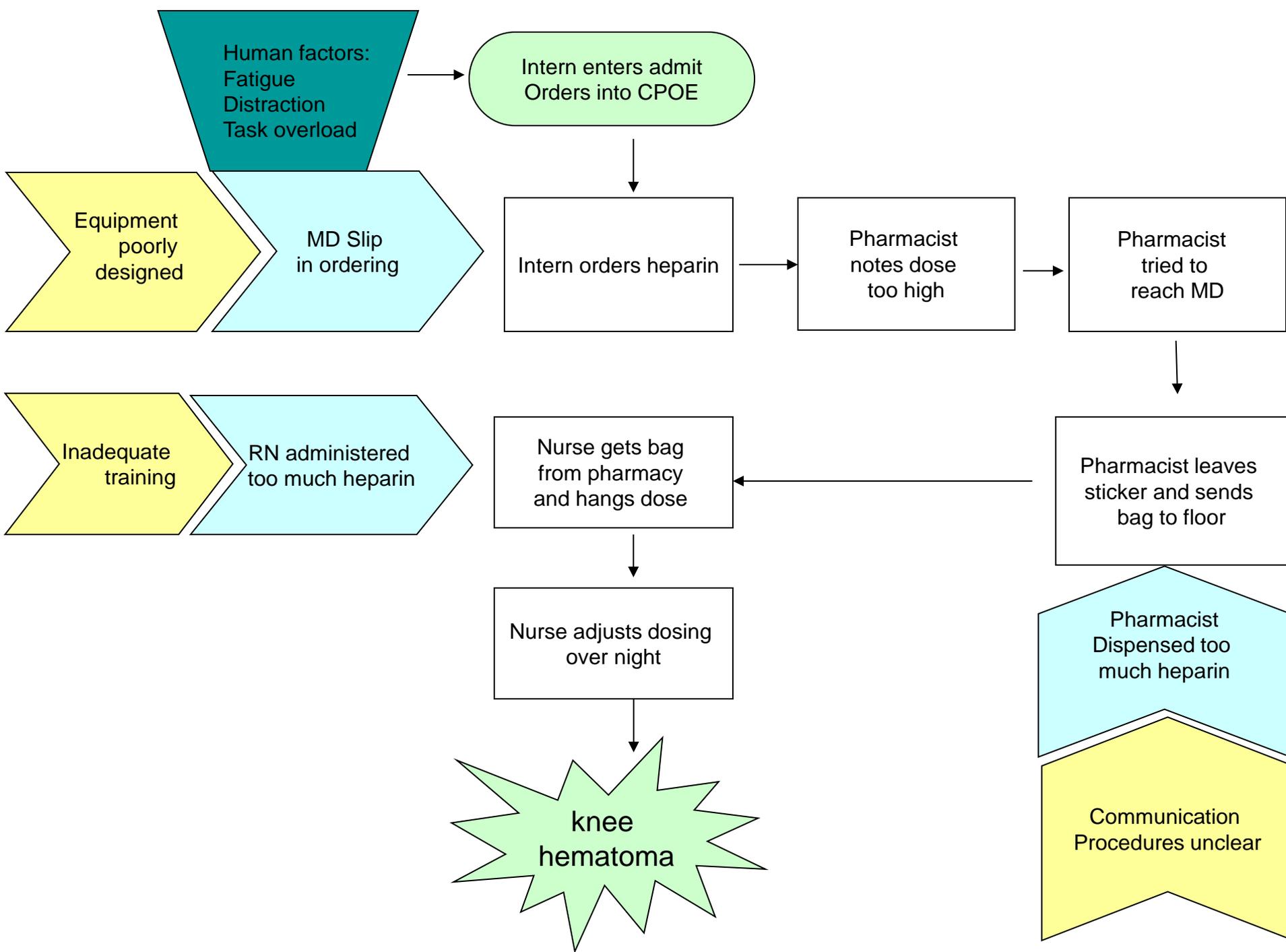
- Arise from decisions that are made when systems are designed or evolve.
- Examples:
 - information or policies
 - environment or equipment design
 - communication failures
 - human resources including staffing and training
- Can lie dormant for years and only become evident when local circumstance conspire with an active failure of an individual and an accident occurs.
- Five why's

Identifying Contributory Factors

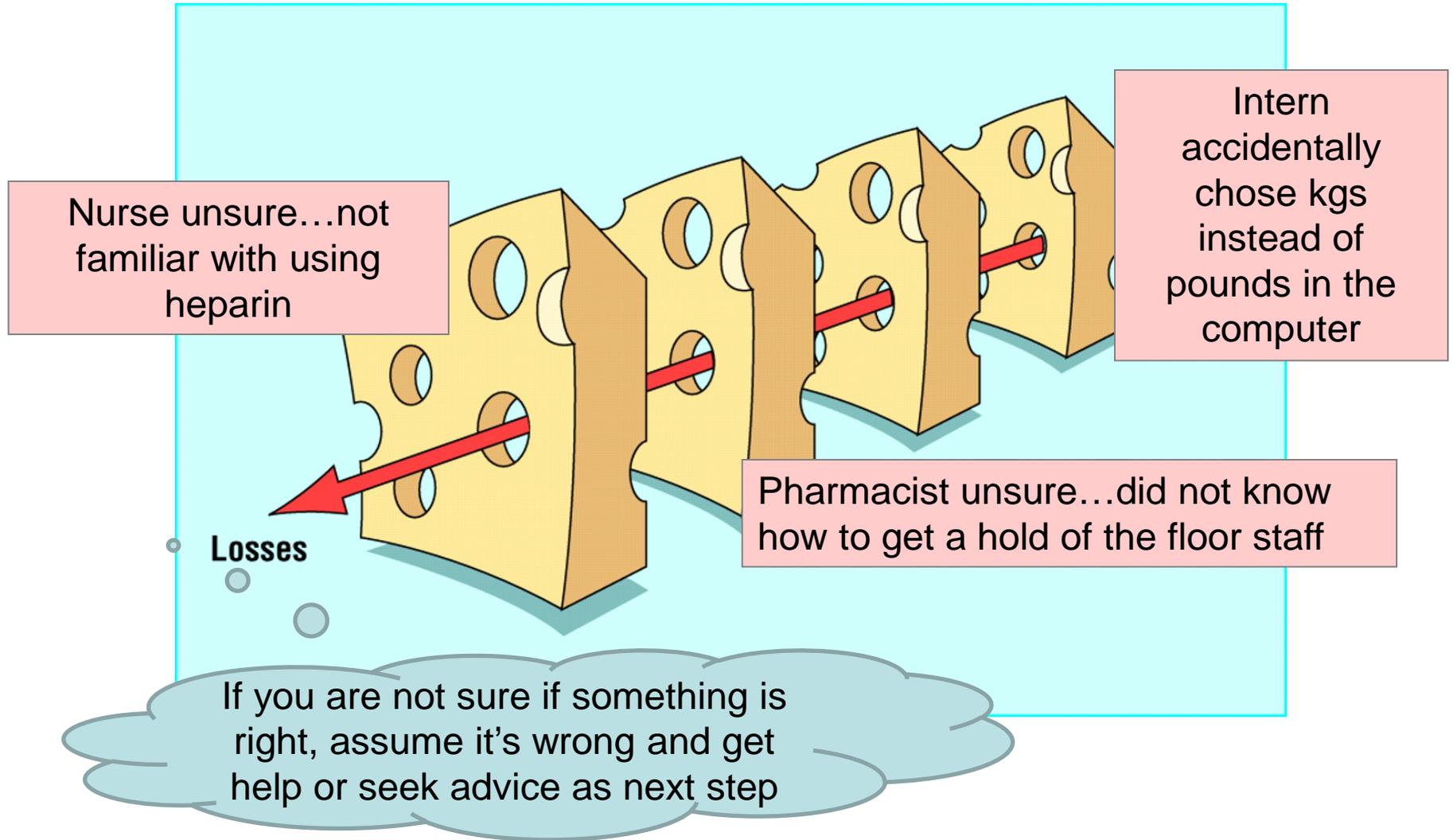


Determining Contributing Factors

Patient	Complexity and seriousness of condition Language and communication; personality and social factors
Task	Availability and use of protocols Availability and accuracy of test results
Individual	Knowledge and skills; motivation and attitude Physical and mental health
Team	Verbal and/or written communication Supervision and willingness to seek help Team leadership
Work environment	Staffing levels and mix of skills; patterns in workload and shift Design, availability, and maintenance of equipment Administrative and managerial support
Organizational management	Financial resources and constraints Policy standards and goals Safety culture and priorities
Institutional	Regulatory context; medicolegal environment



Could a Stronger Safety Culture Have Stopped this Error?

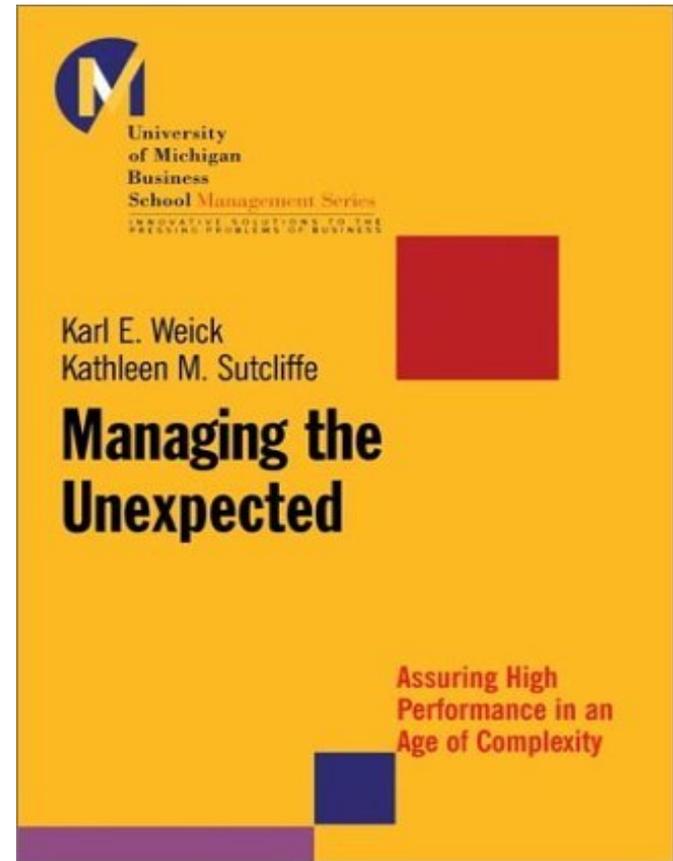


Reason, J. Human Error

Safety Minded People and Teams can make complex systems safer

First Principle of High Reliability Organizations: Preoccupation with Error

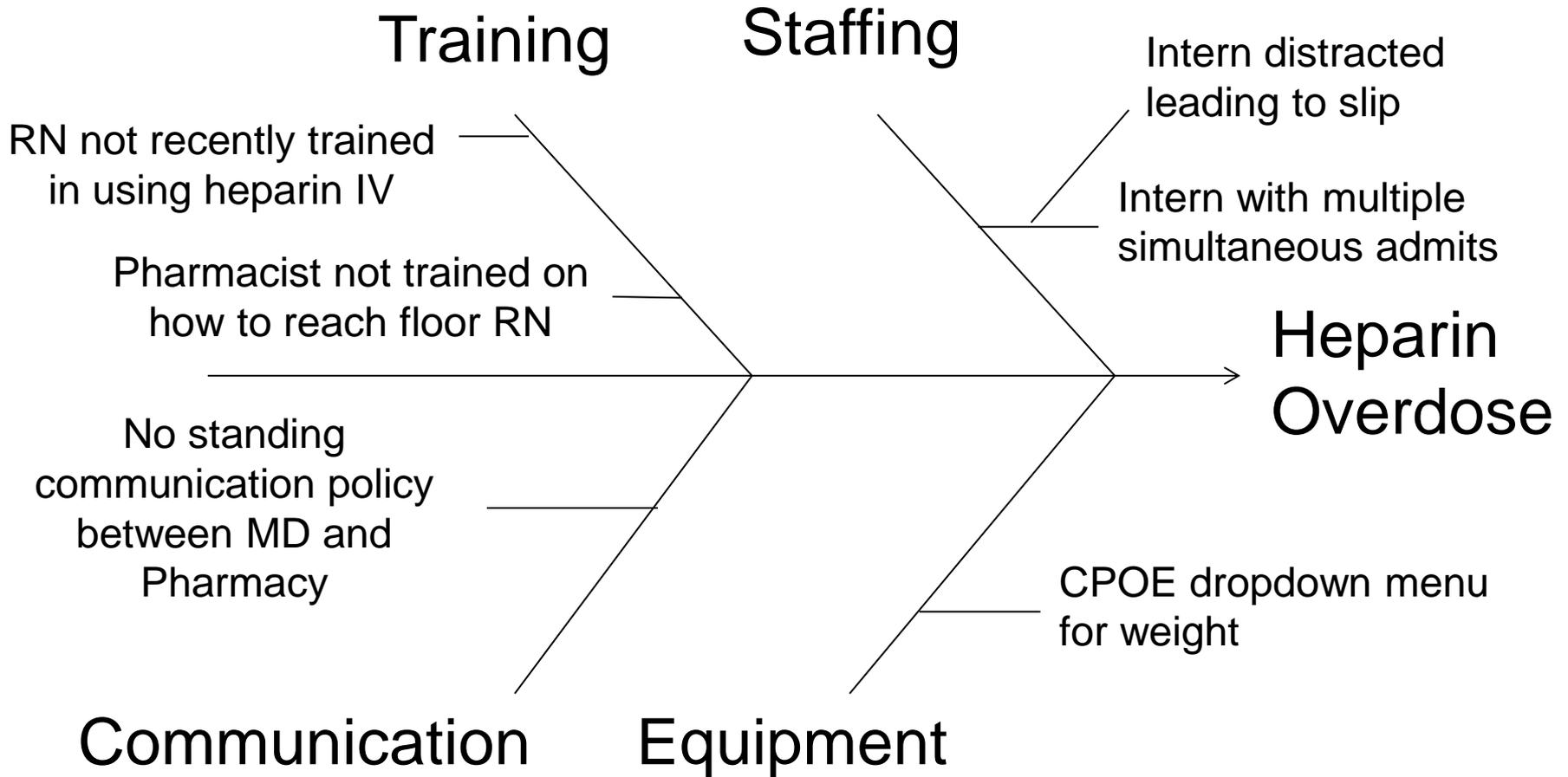
- Regard small, inconsequential errors or “close calls” as a symptom that something is wrong
- Everyone views their role to include reporting errors and stopping to check for errors on the team
- Feel safer speaking up: no fear of reprisals, expect support and praise for asking questions



Contributing Factor Analysis

Level	Characteristics from Vincent Model (1)	Analysis of heparin overdose
Patient	Complexity and seriousness of condition Language and communication Personality and social factors	Post op patient -> increased risk of bleed
Task or technology	Availability and use of protocols Availability and accuracy of test results	Intern did not review protocol before signing
Individual staff member	Knowledge and skills; Motivation and attitude Physical and mental health	Nurse not familiar with heparin
Team	Verbal and written communication Supervision and willingness to seek help; Team leadership	Pharmacist to MD/RN communication unclear Pharmacist not supervised
Work environment	Staffing levels and mix of skills Patterns in workload and shift Design, availability, and maintenance of equipment Administrative and managerial support	CPOE dropdown too easy to pick wrong dose Intern workload
Organization management	Financial resources and constraints Policy standards and goals Safety culture and priorities	Nurse did not think to ask supervisor for help
Institutional	Regulatory context; Medicolegal environment	

Cause-Effect Diagram*



* Also known as fishbone diagram

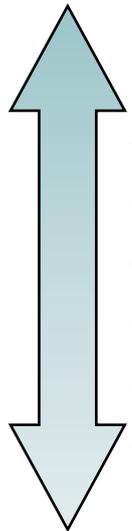
Making Recommendations & Developing an Action Plan

What do we need to think about here?

- Resources
- Feasibility
- Timeliness
- Effectiveness

Ranking the Effectiveness of Error-Reduction Strategies

Most Effective (Strong)



- Forcing functions and constraints
- Automation and computerization
- Standardization and protocols
- Checklists and double-check systems
- Rules and policies
- Education and information
- Exhortation: "Be more careful. Be vigilant."

Least Effective (Weak)



How do you prevent customers from leaving their ATM cards behind?

Strong Actions: Swipe card only

Intermediate Actions: Beeping

Weak Actions: Signs

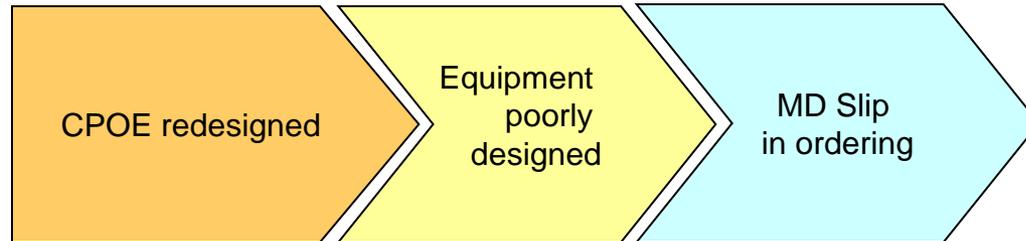
Making Recommendations & Developing an Action Plan

What system fix(es) might we propose?

Table Top Exercise
Debrief

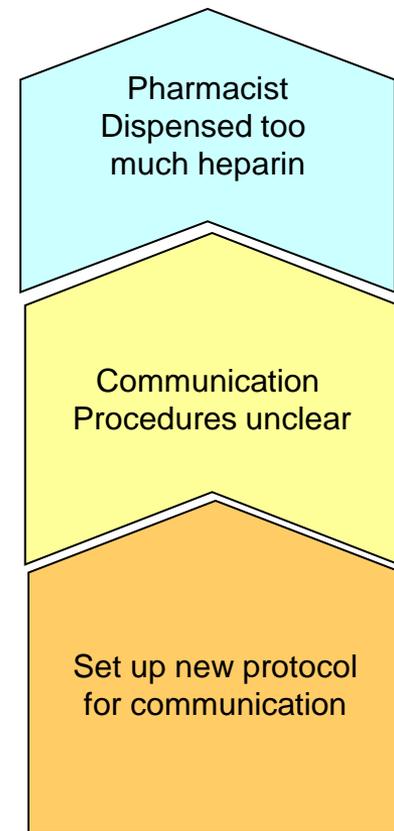
Interventions

What system fix(es) were proposed?

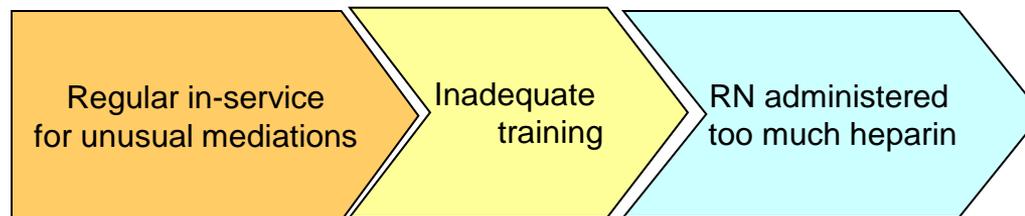


What about the other system failures?

2) Communication procedure unclear (communication failure)



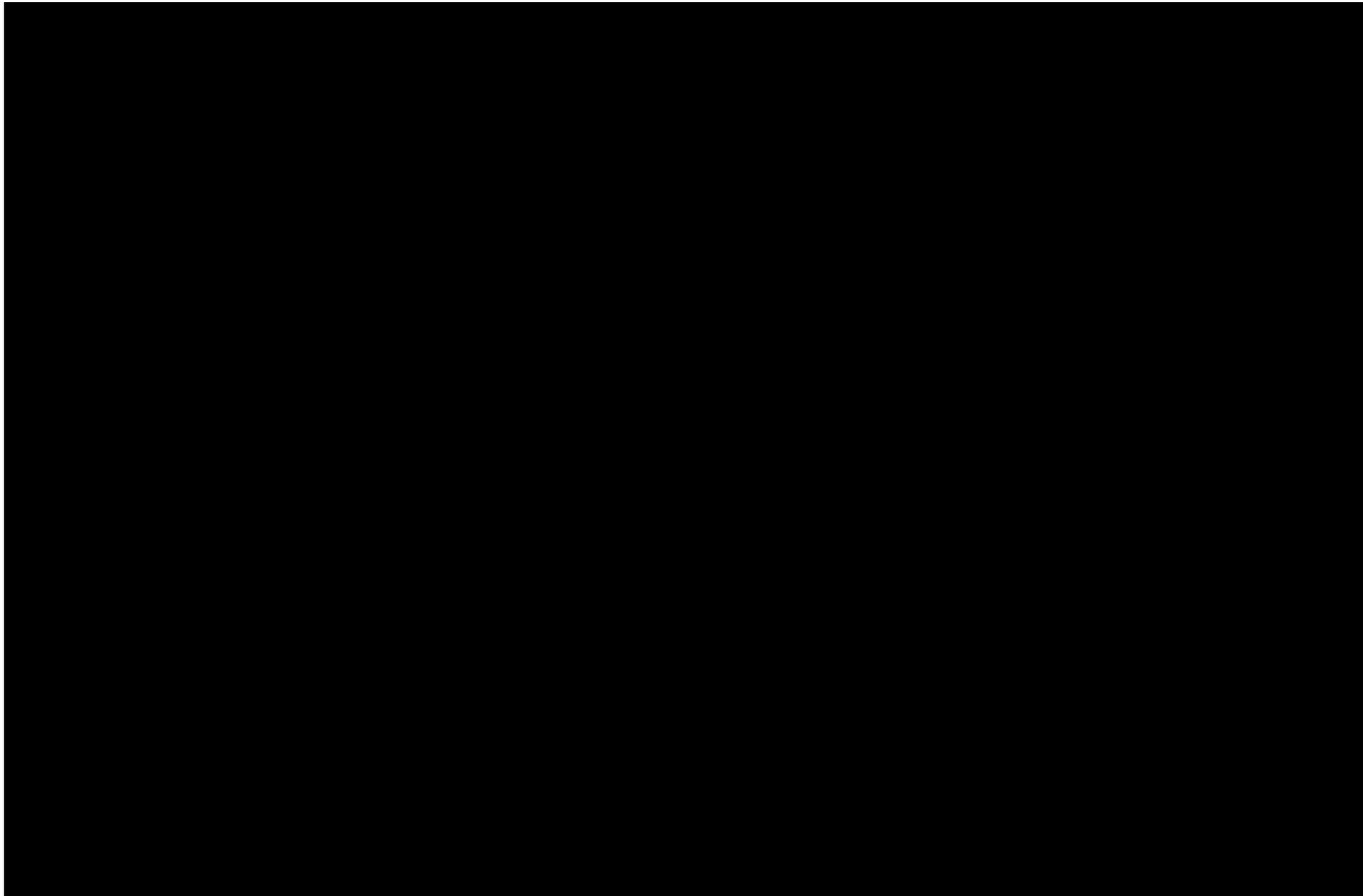
3) Inadequate training/familiarity for heparin



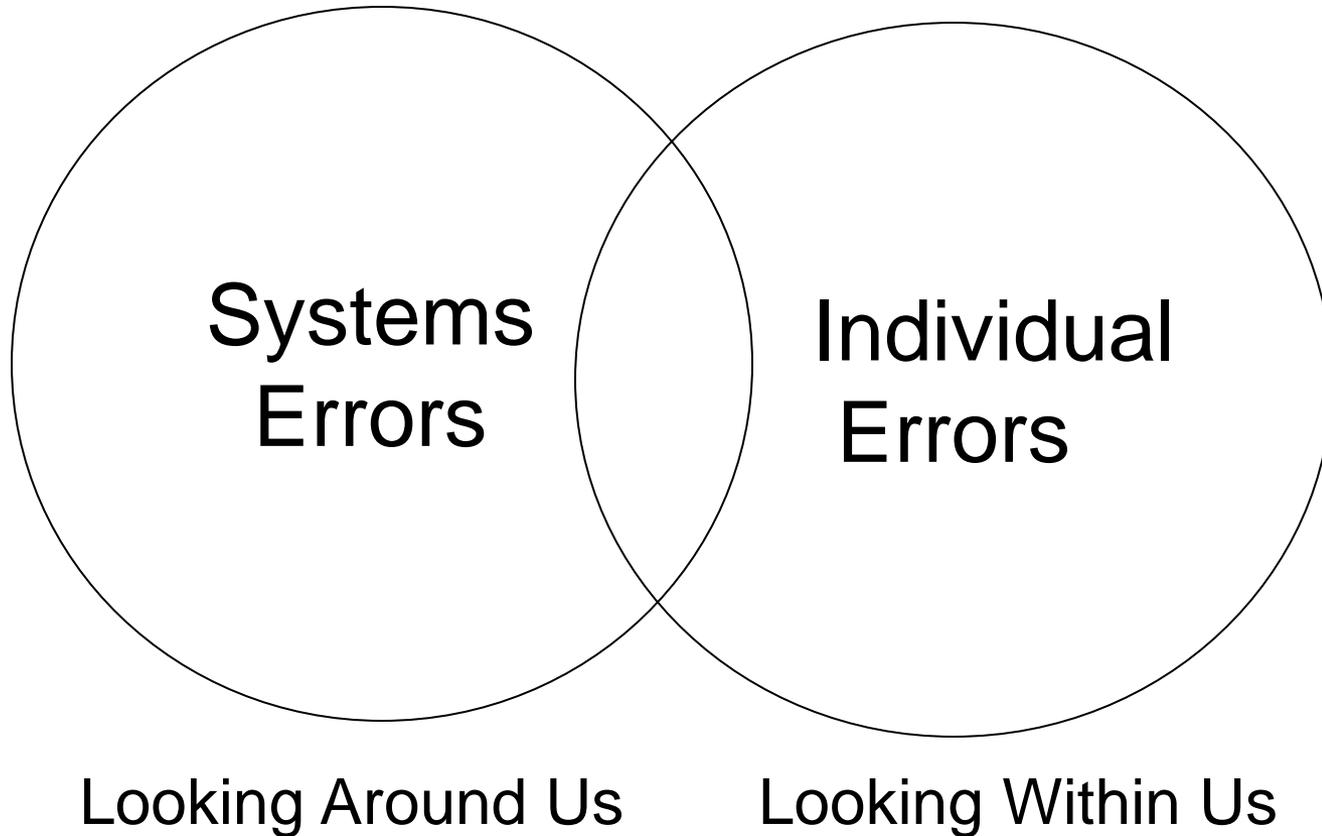
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Patient Safety is Not Always About the System



Categories of Error

System Related

- Design
- Environment
- Policies/Procedures
- Workload
- Supervision
- Communication

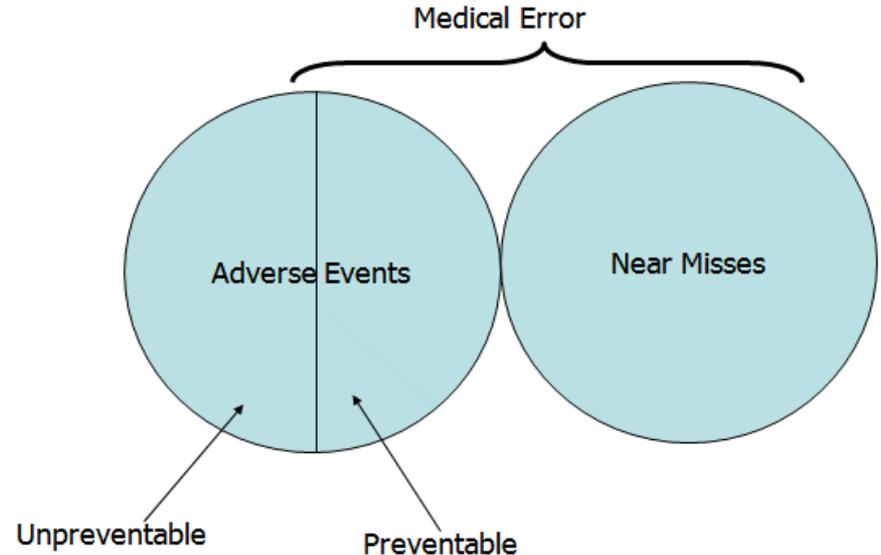
Individual

- 1) Cognitive Error
- 2) Technical Error
- 3) Knowledge Error
- 4) Lack of Accountability or Responsibility

Cognitive Errors Often Lead to Errors in Diagnosis

Diagnostic Error Facts

- 18-20% of all preventable adverse events
- Ranked #2- #5 in medical malpractice claims



- Most common in the “cognitive specialties”...that’s us
- Critical subset of diagnostic errors arise through something called “cognitive error”

Systems and Cognitive Errors Often Travel Together

Origins of diagnostic error in 100 patients

19% related to Systems Error

Forgot to f/u on the PSA...

Poor communication among consultants

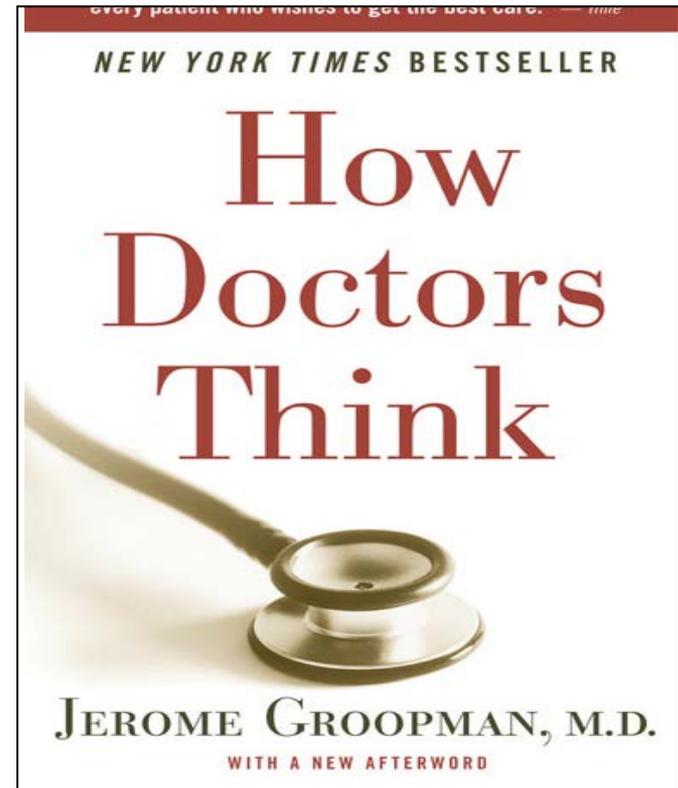
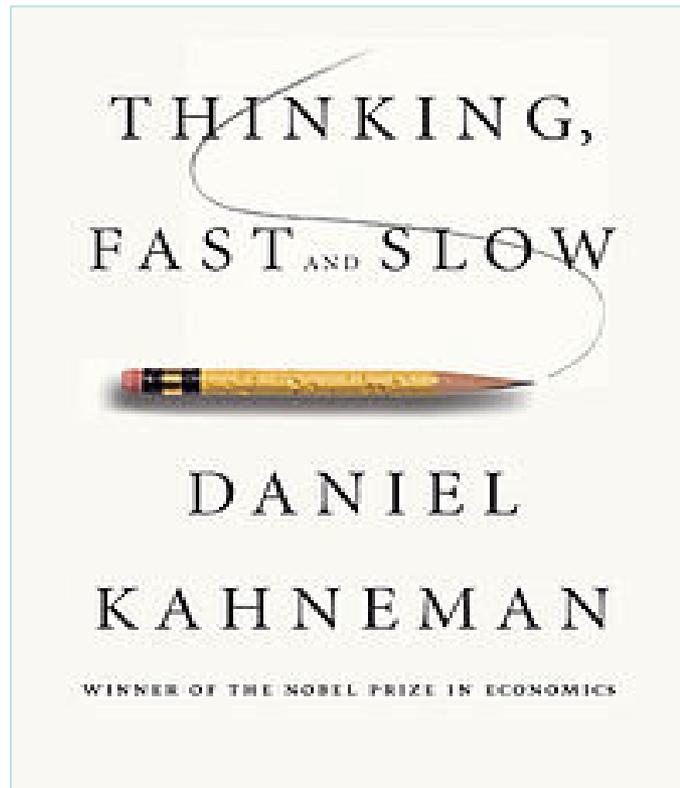
28% related to Cognitive Error

Didn't expand your differential diagnosis

The right diagnosis wasn't "available" in your brain

46% related to both Systems and Cognitive Errors

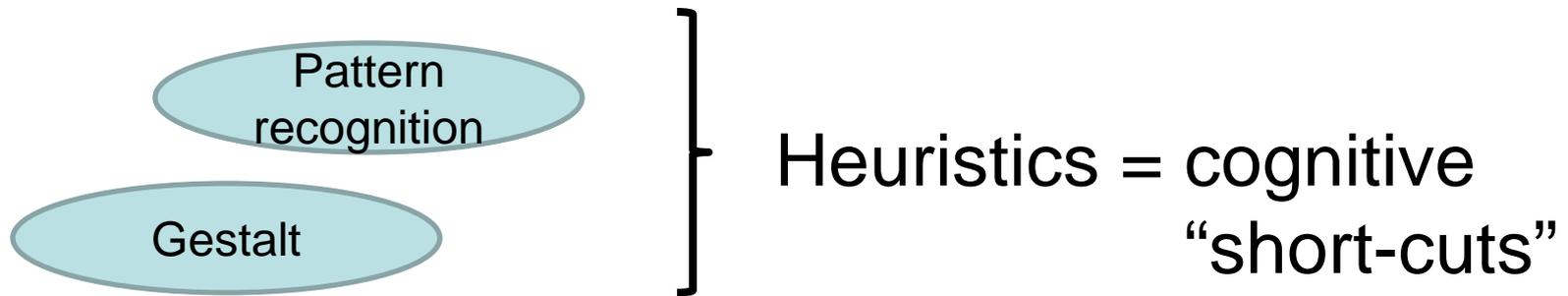
Thinking About How We Think



Kahneman and Tversky established the cognitive basis for common human errors, heuristics and biases in 1973

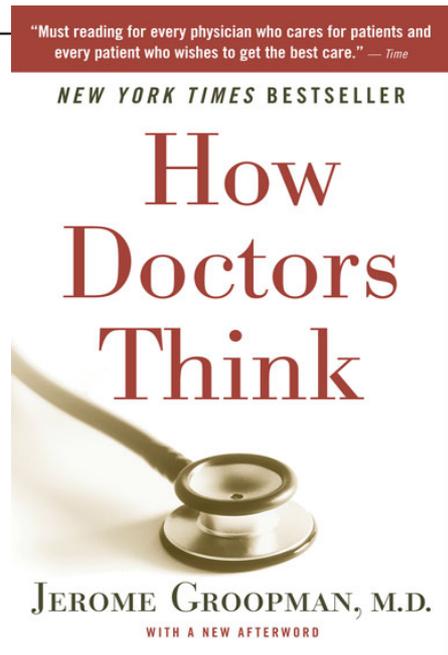
Describes cognitive psychology as it relates to clinical medicine

Thinking About How We Think

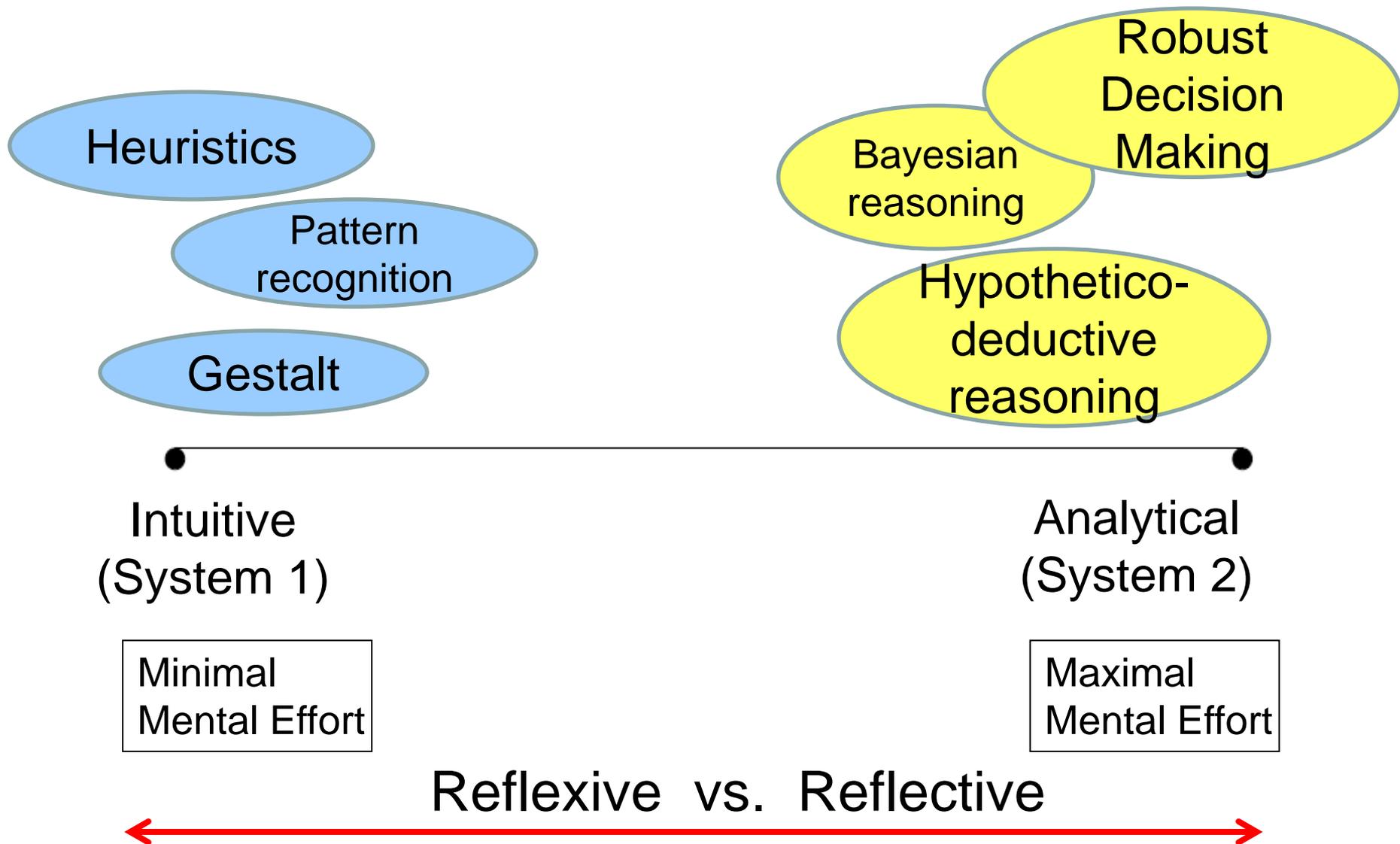


Intuitive

Minimal
Mental Effort



The Dual Process Model

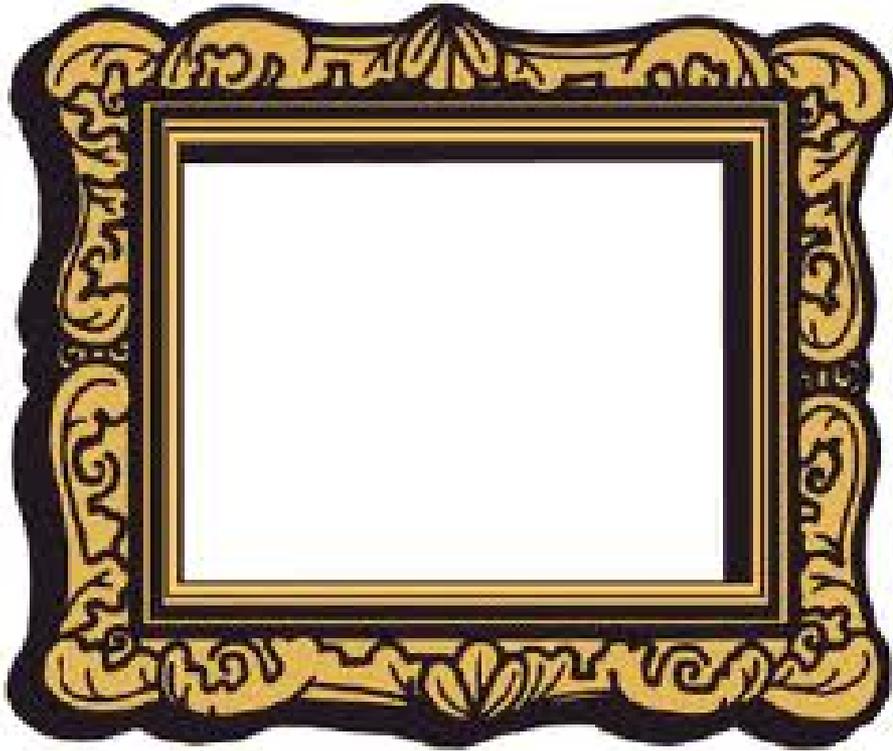


Anchoring Bias



- the failure to continue considering reasonable alternatives after a primary diagnosis is reached, is the most common diagnostic error
- *When the diagnosis is made, the thinking stops*

Framing Effect



How we see things is strongly influenced by the way a problem is framed .

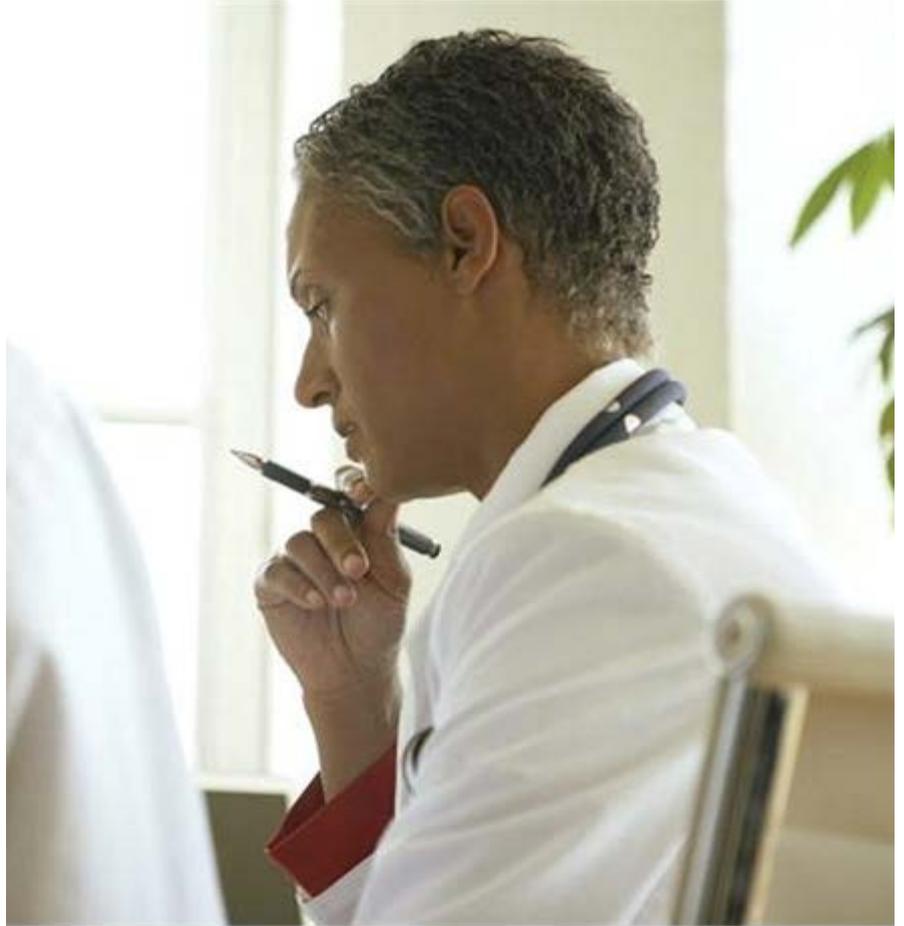
Diagnosis Momentum

- Also known as “chart-lore”
- once diagnostic labels are attached to patients, they become stickier and stickier



Availability Heuristic

Humans judge things as being more likely if they readily come to mind



Visceral Bias

- Counter-transference
- Negative feelings towards a patient may affect our diagnostic decision making
- Common Types
 - Non-adherent patients
 - Homeless patients
 - Patients with chronic pain
 - Obese patients



Think Back to the Video

Were any of these biases
present?

Types of Cognitive Bias

Example

Anchoring

PCP “anchored” on the diagnosis of lumbar strain and did not seek to expand differential diagnosis

Diagnosis Momentum

PCP exhibited diagnosis momentum by not re-assessing the diagnosis of “acute lumbar strain” from ED

Visceral Bias

ED resident had a visceral reaction to the patients’ request for pain meds given history of prior IVDU

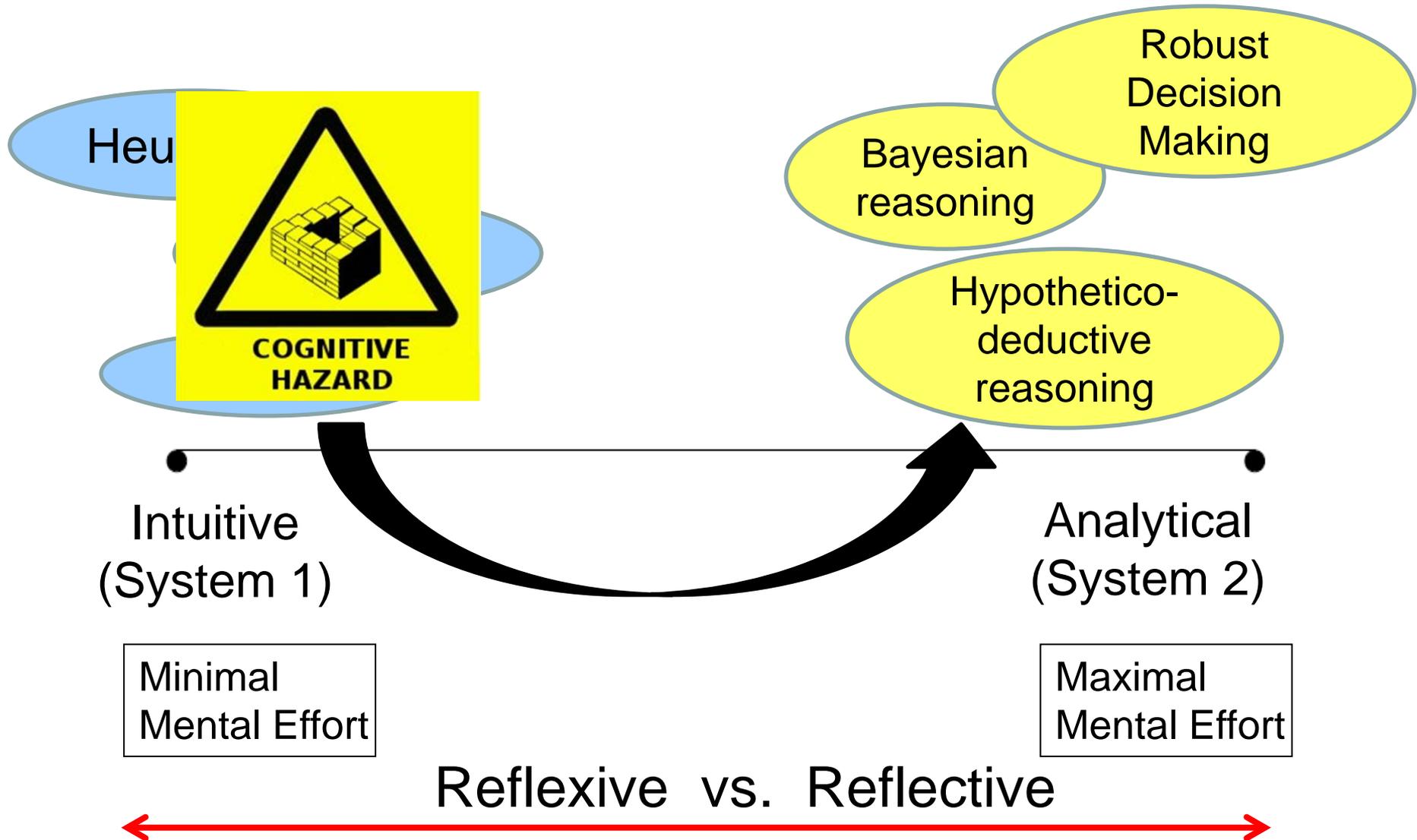
Availability Bias

Resident less likely to put spinal metastases or epidural abscess on ddx because they have seen less cases of this (less cognitively “available” to them)

Avoidance Strategies for Cognitive Errors

- Be skeptical of established diagnoses (**Diagnostic time out**)
 - What else can it be?
 - Is there anything that doesn't fit?
 - Is it possible that there's more than one thing going on?
 - Is this a case where I need to “slow down”?
- Identify and consider the worst-case scenario
- Maintain a systematic approach for dealing with differential diagnoses
- Know your visceral biases

“Slowing Down When You Should”



Practice identifying, differentiating, and categorizing systems versus cognitive errors

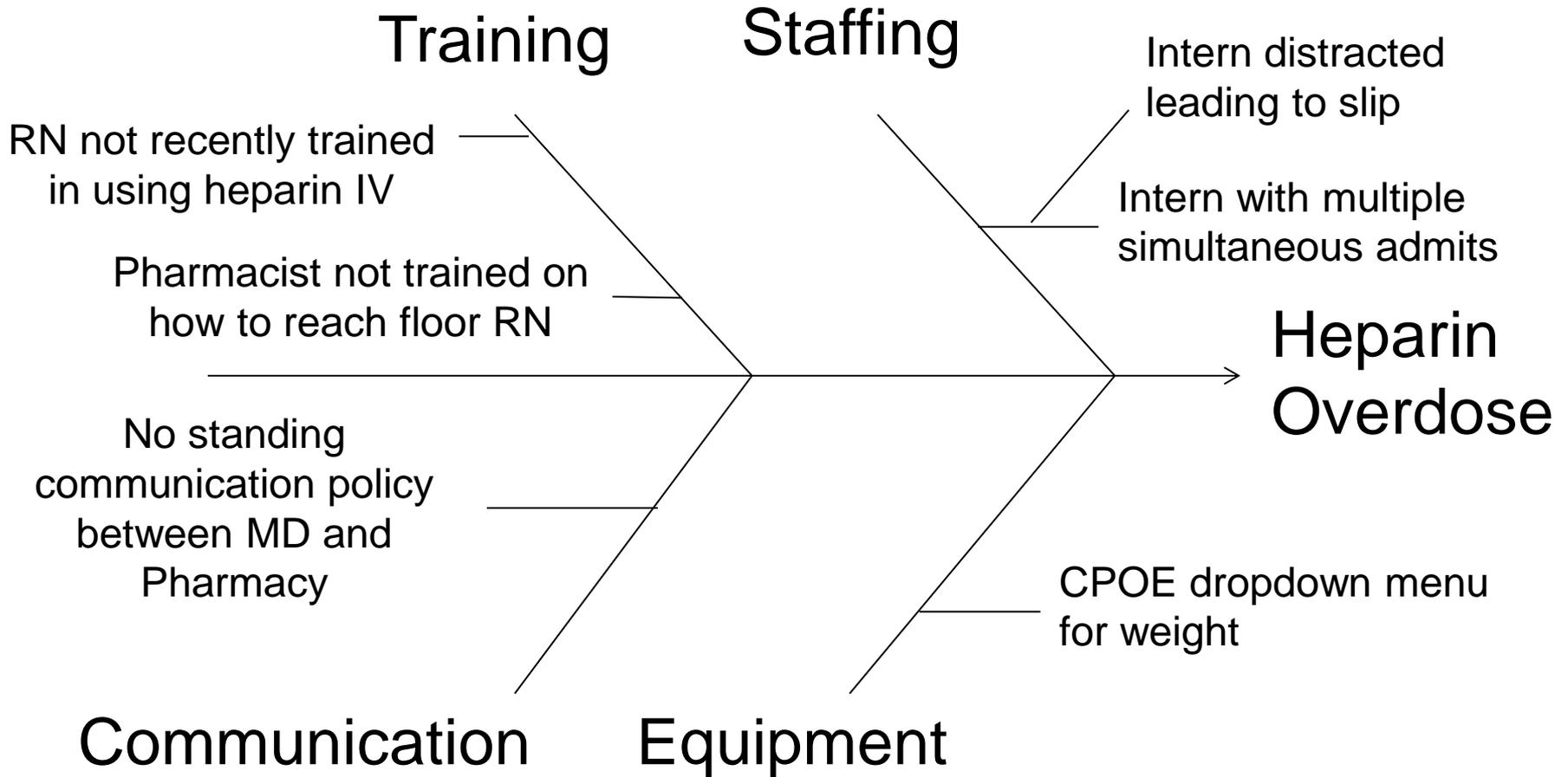
Why are we making you do this?



Practice at Your Table

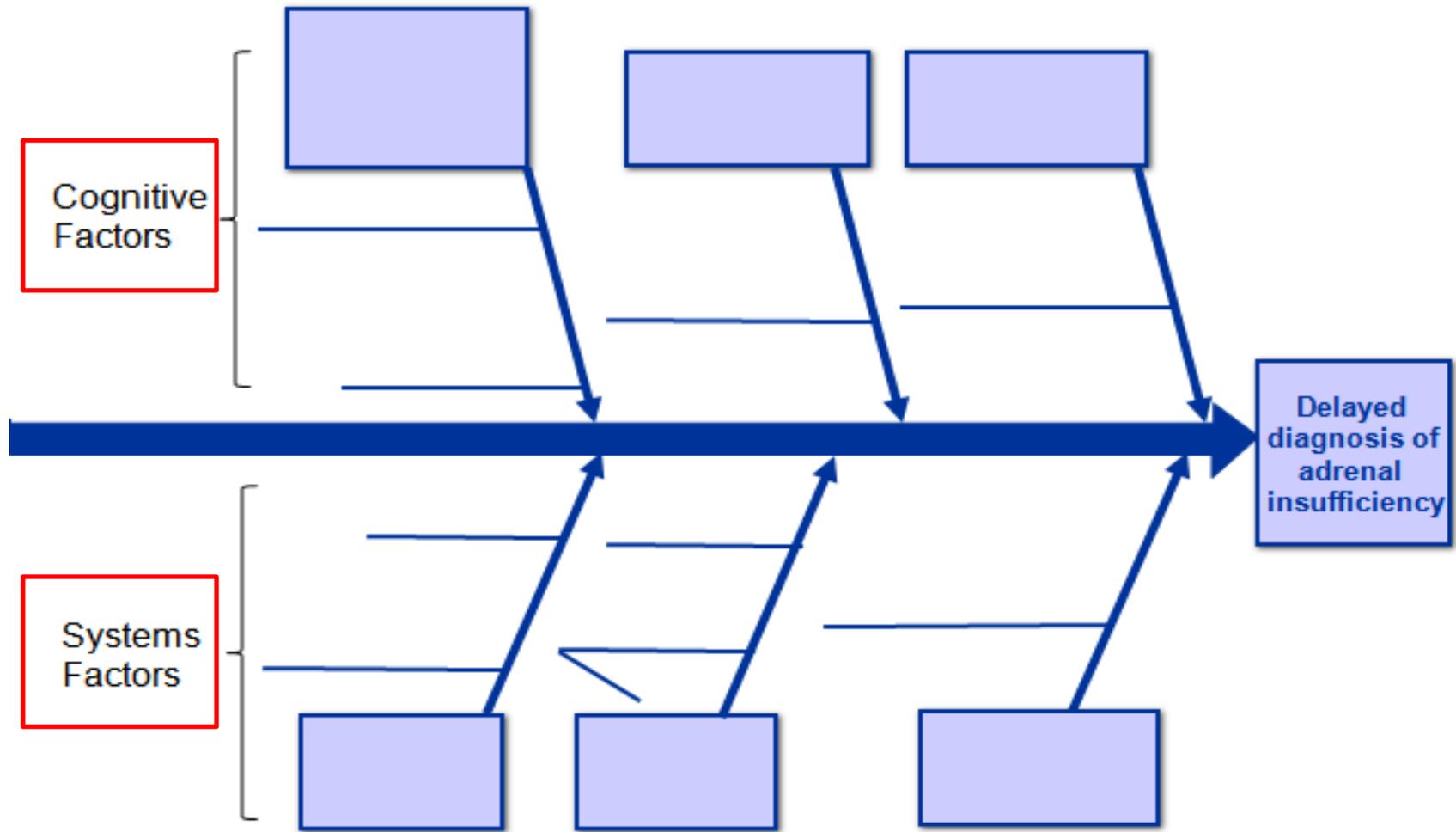
- Choose one person at your table to read the “Delayed Diagnosis of Adrenal Insufficiency” case” out loud
- Fill in the cognitive-systems fishbone naming at least one systems error and one cognitive error

Cause-Effect Diagram*



* Also known as fishbone diagram

Creating a Different Type of Fishbone Diagram



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But What About the Resident...



The Second Victim

“Virtually every practitioner knows the sickening feeling of making a bad mistake. You feel singled out and exposed — seized by the instinct to see if anyone has noticed. You agonize about what to do, whether to tell anyone, what to say. Later, the event replays itself over and over in your mind. You question your competence but fear being discovered. You know you should confess, but dread the prospect of potential punishment and of the patient's anger.”

Wu, JGIM, 2000

Stories

Pitfalls and Tips for Leading Patient Safety in Residency Programs

Resident kept out of the error conversation



Take proactive steps to facilitate this in your institution

Requiring a resident to participate in a public discussion about their error



Seek to understand where they are emotionally and give them a choice

Involve the program directors and chief residents

Not understanding the role of risk managers in your hospital

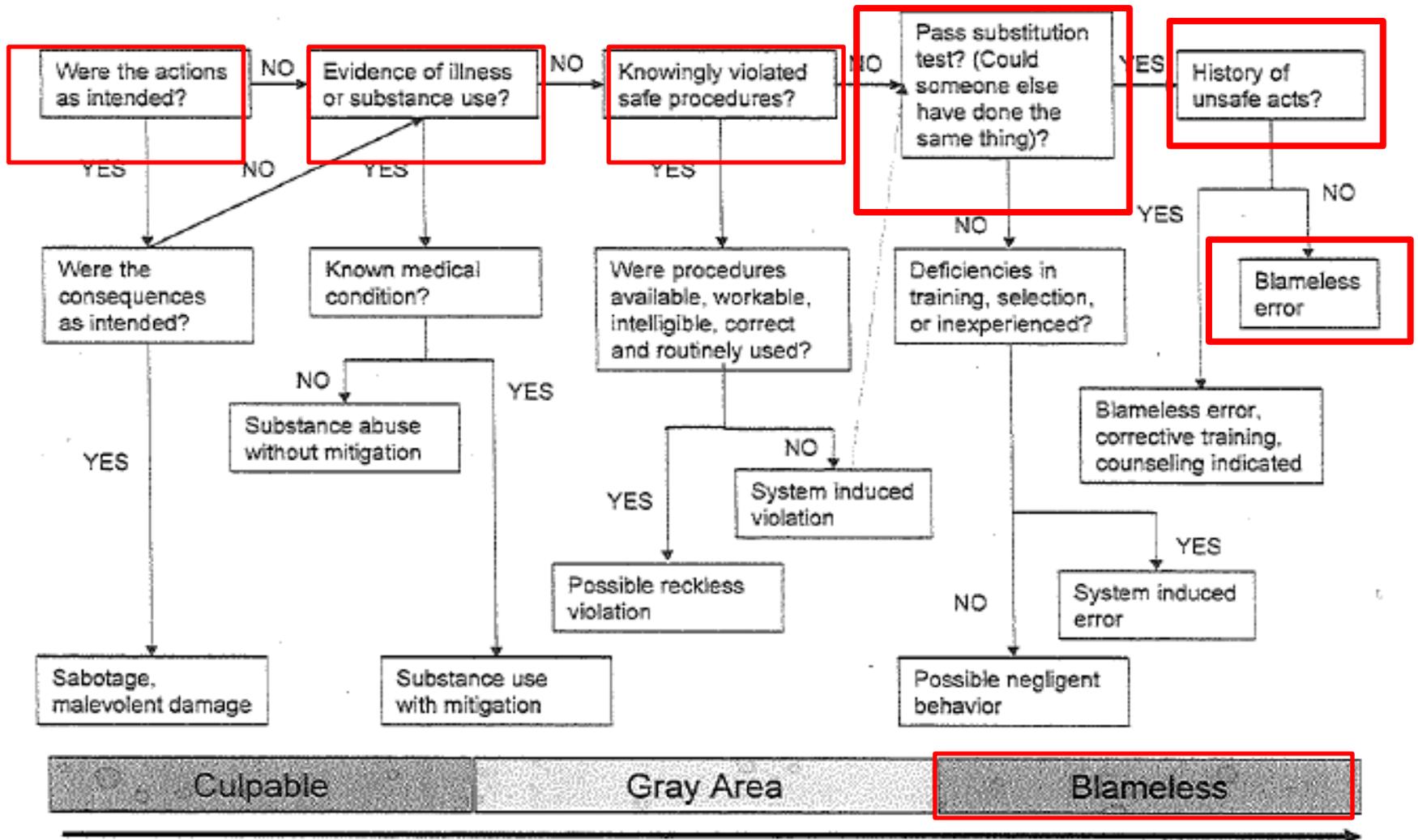


Educating residents about the role of risk managers

Bonus tip: Whenever possible, avoid email and the phone for these discussions

What to do about the resident
who is devastated and still
blames himself?

UNSAFE ACTS ALGORITHM



Adapted from James Reason. (1997). Managing the Risks of Organizational Accidents.

A large majority of medical errors meet the definition of "blameless error"

Questions?

