

# Teaching Patient Safety

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Quality and Safety Educators Academy  
May 1, 2014

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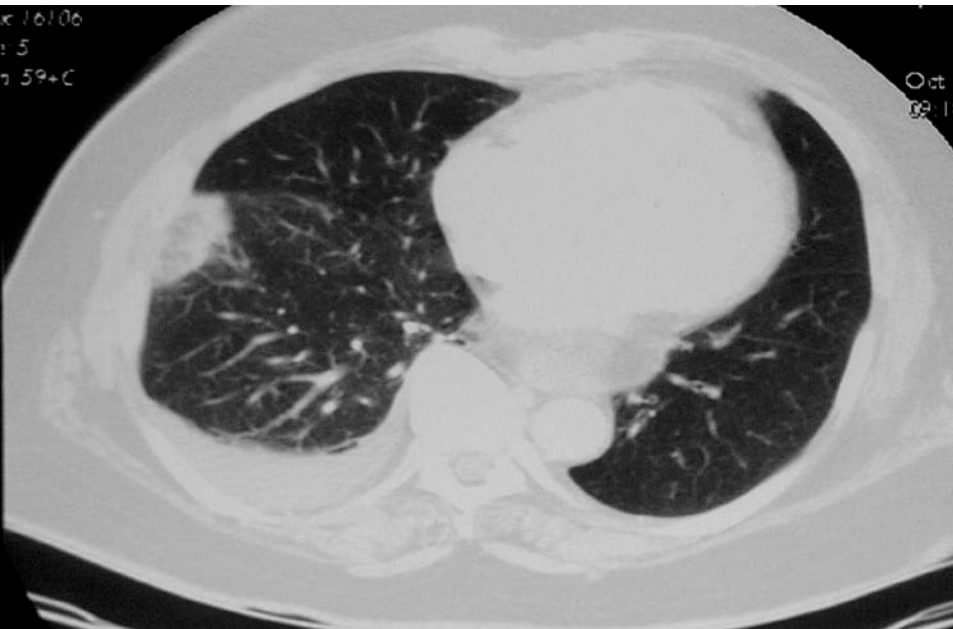
# Our Goals

*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.



Orders: All Status: All				97 orders
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	
phs temazepam - 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:	
lisinopril - tablet 5 mg oral Daily	03-May-2010 Routine	Discontinued	04-May-2010 08:	
docusate sodium - capsule (Known as COLACE -) 100 mg oral 2 times per day	01-May-2010 Routine	Active	30-Jul-2010	
phs 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:	
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 (15 minutes)	Completed/Expired	30-Apr-2010 08:	
phs acetaminophen - tablet (Known as TYLENOL -)	30-Apr-2010 Routine	Discontinued	01-May-2010 11:	

# 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

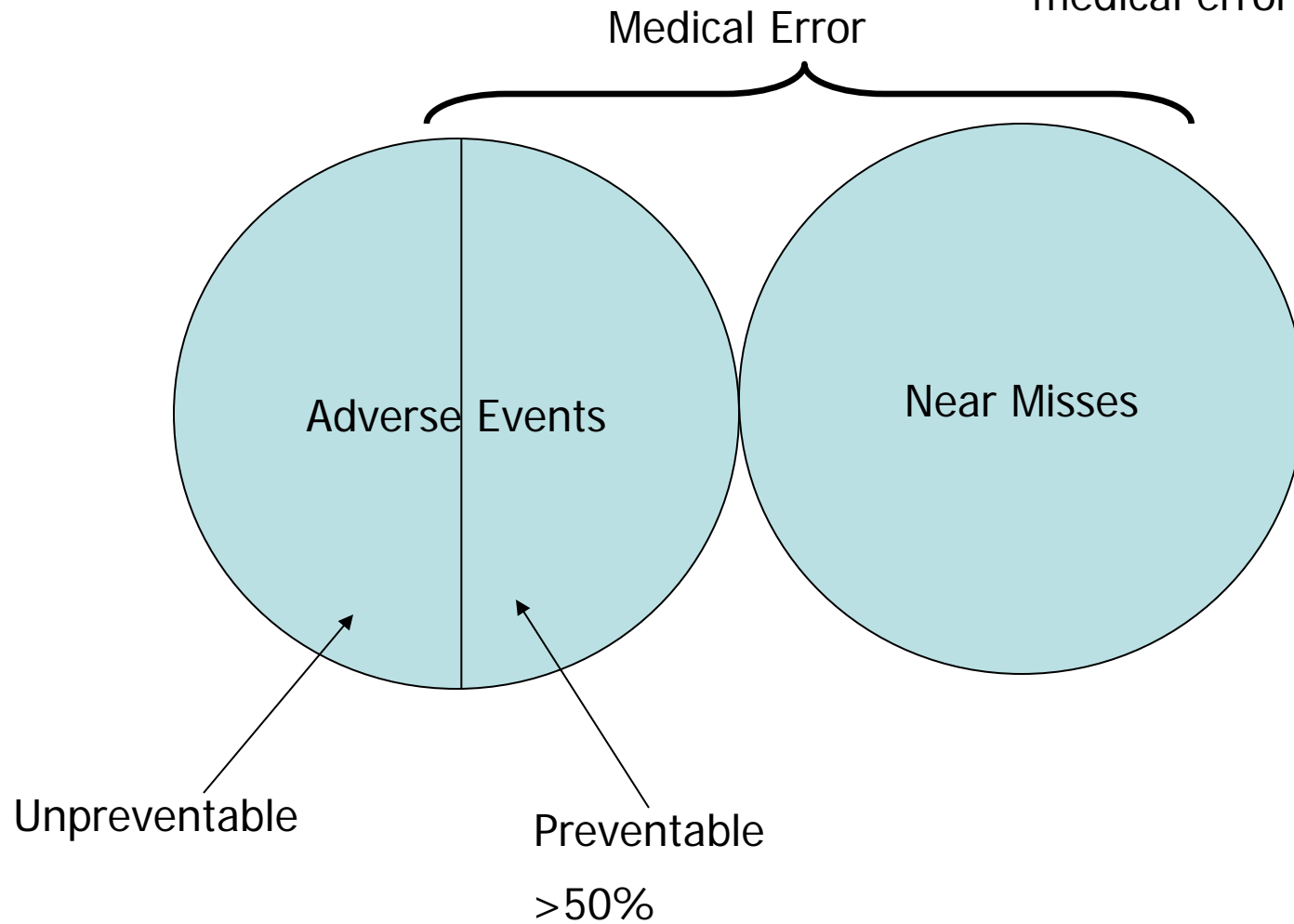
- Anytime a patient suffers a negative outcome from an interaction with the healthcare system
- Adverse events can both be preventable and unpreventable.
- Examples of preventable adverse events include
  - Medication errors
  - Diagnostic errors
  - Procedural errors.

# 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”



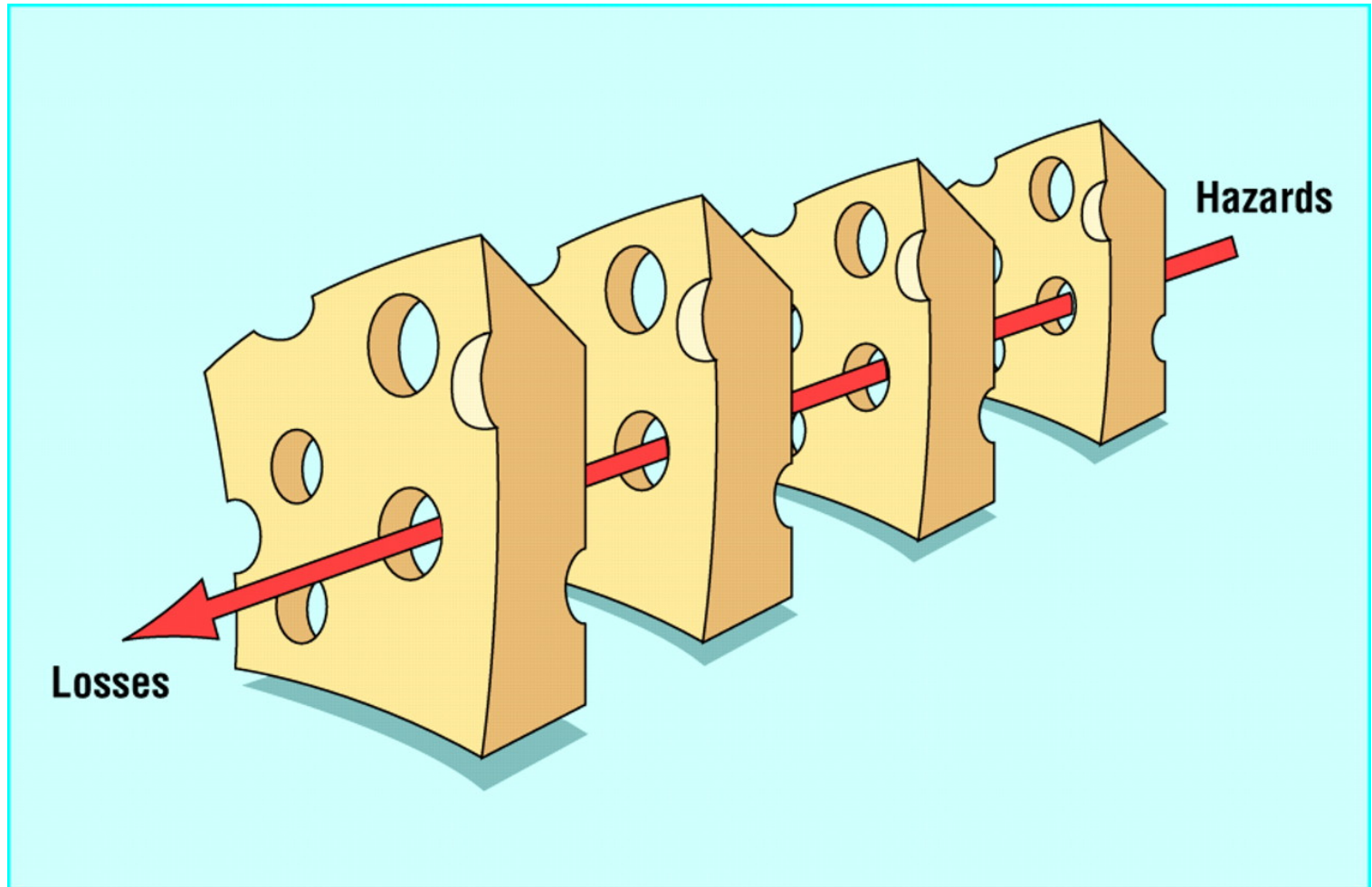
44-98,000 people  
could die annually  
as a result of  
medical error



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

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

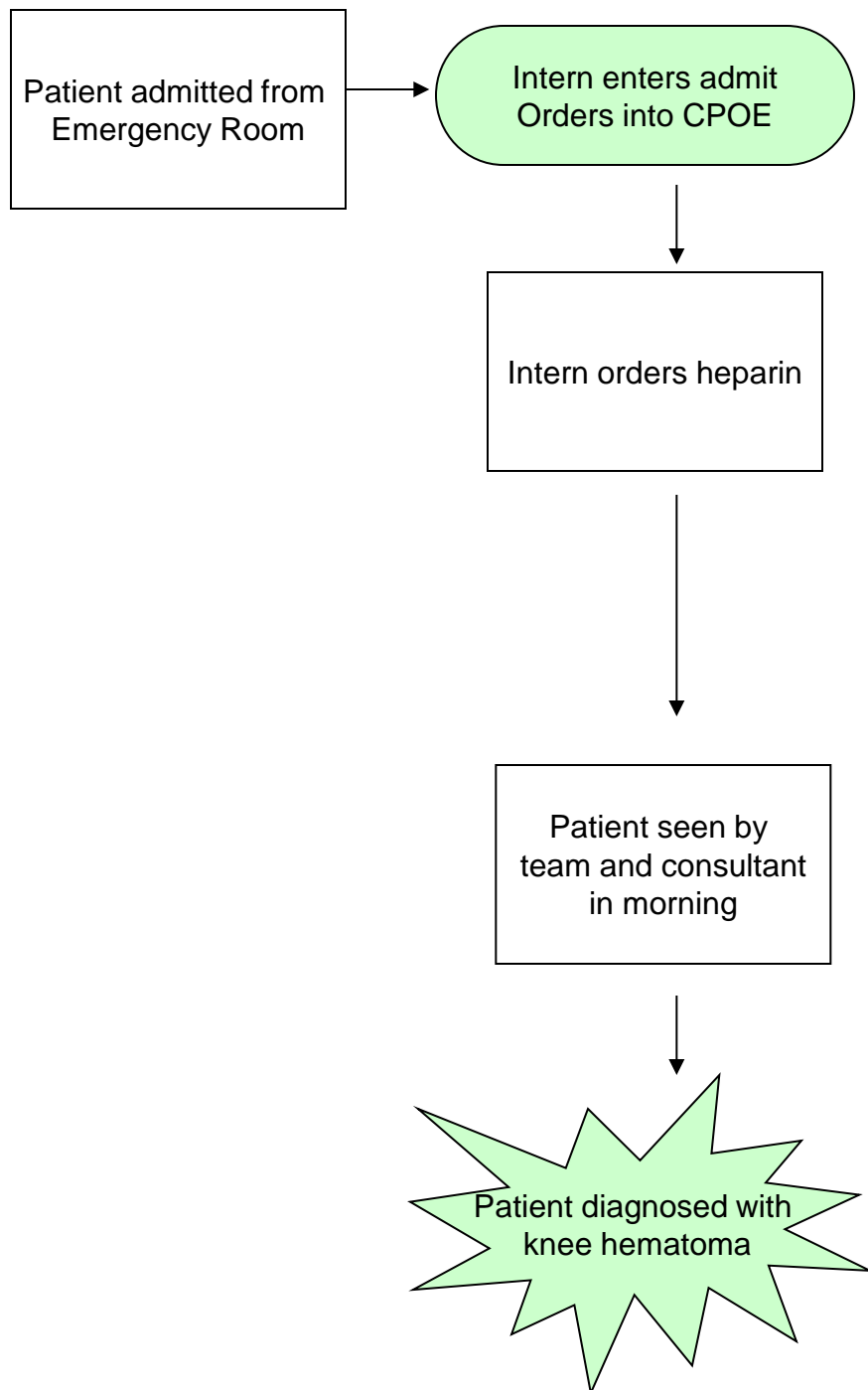


# Back to the Case

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

# 3. 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: 

kgs

kgs

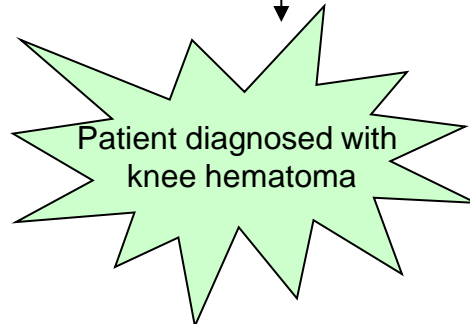
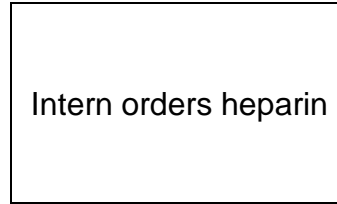
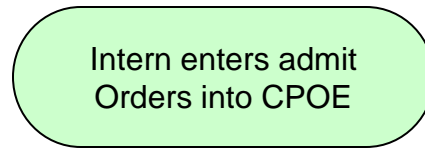
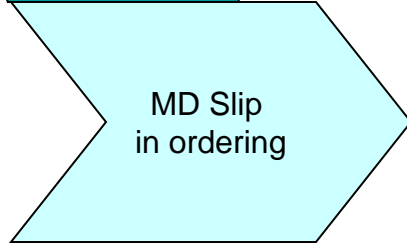
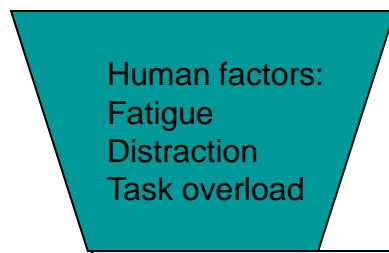
lbs

 Entered kgs instead of lbs

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 mean the other.**



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.

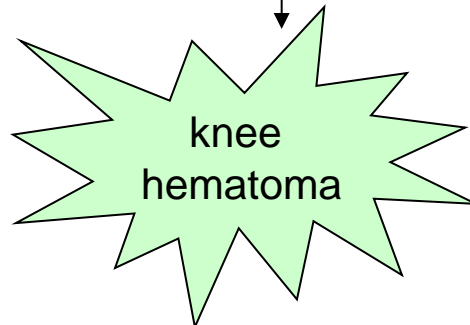
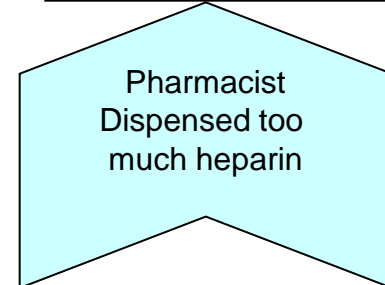
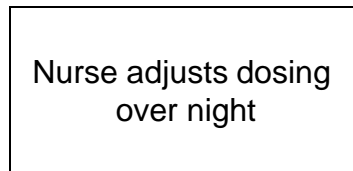
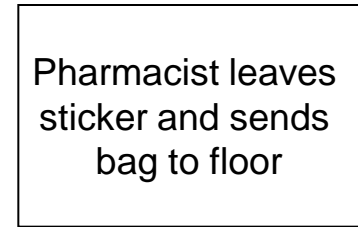
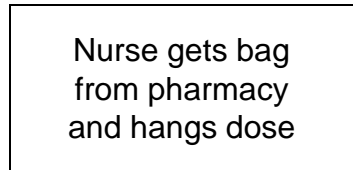
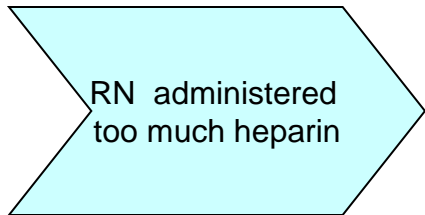
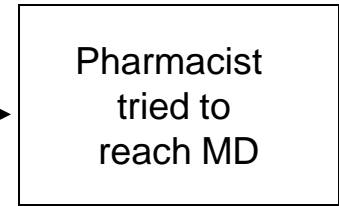
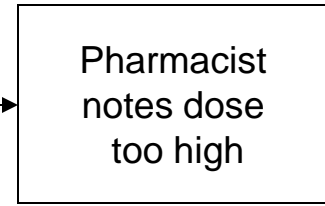
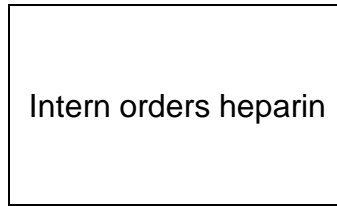
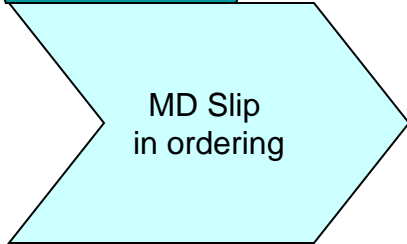
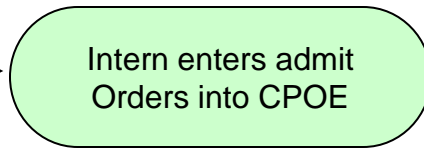
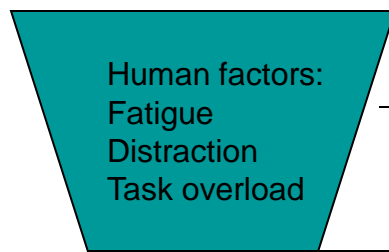
“I heard the next day she never saw the sticker and ran the heparin at the higher dose.”

# 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.”



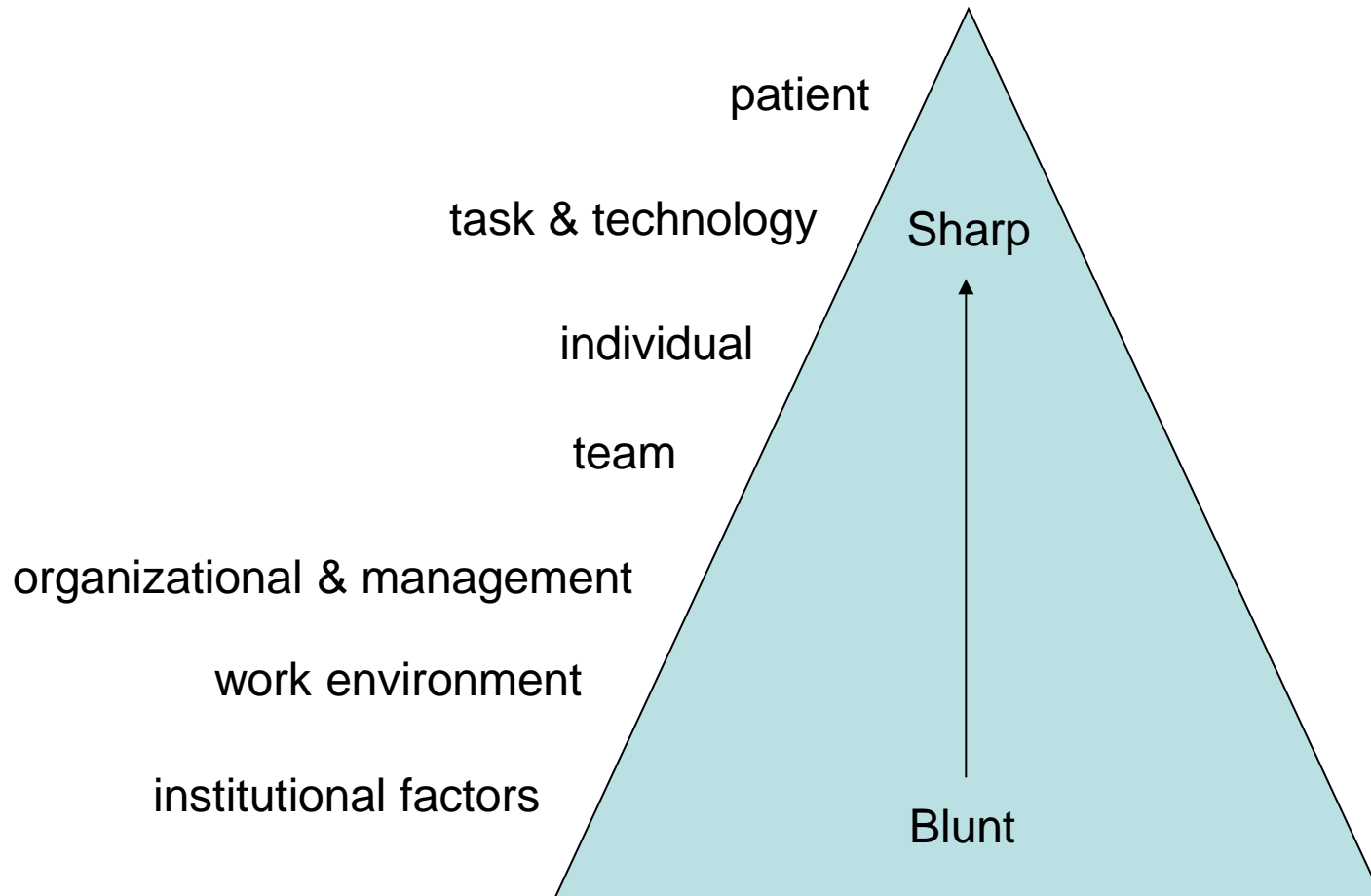
Identify care  
Incident  
delivery  
chronology  
problems

# 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

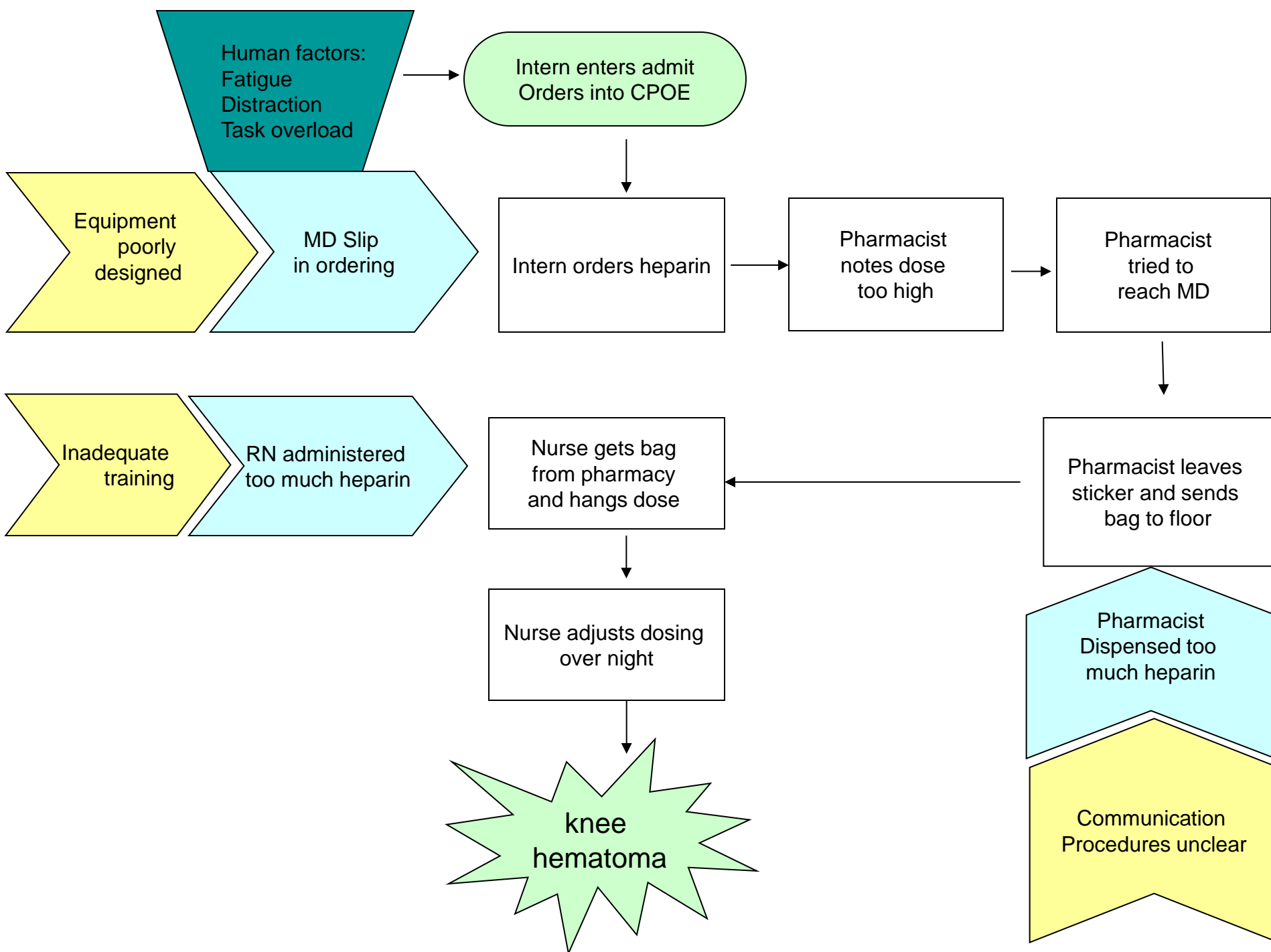


# 4. Identify Contributory Factors

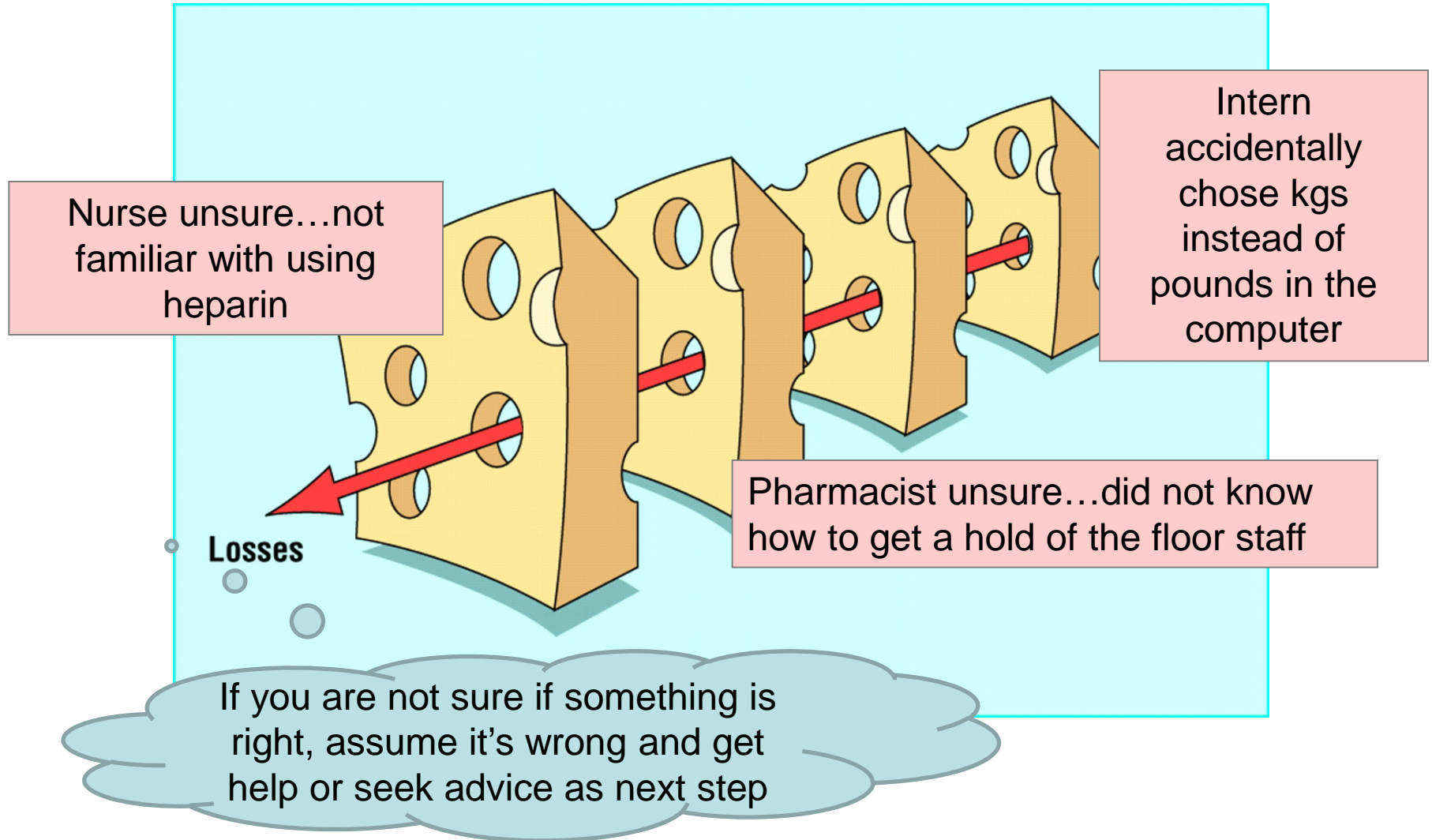


# Determining Contributing Factors

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?

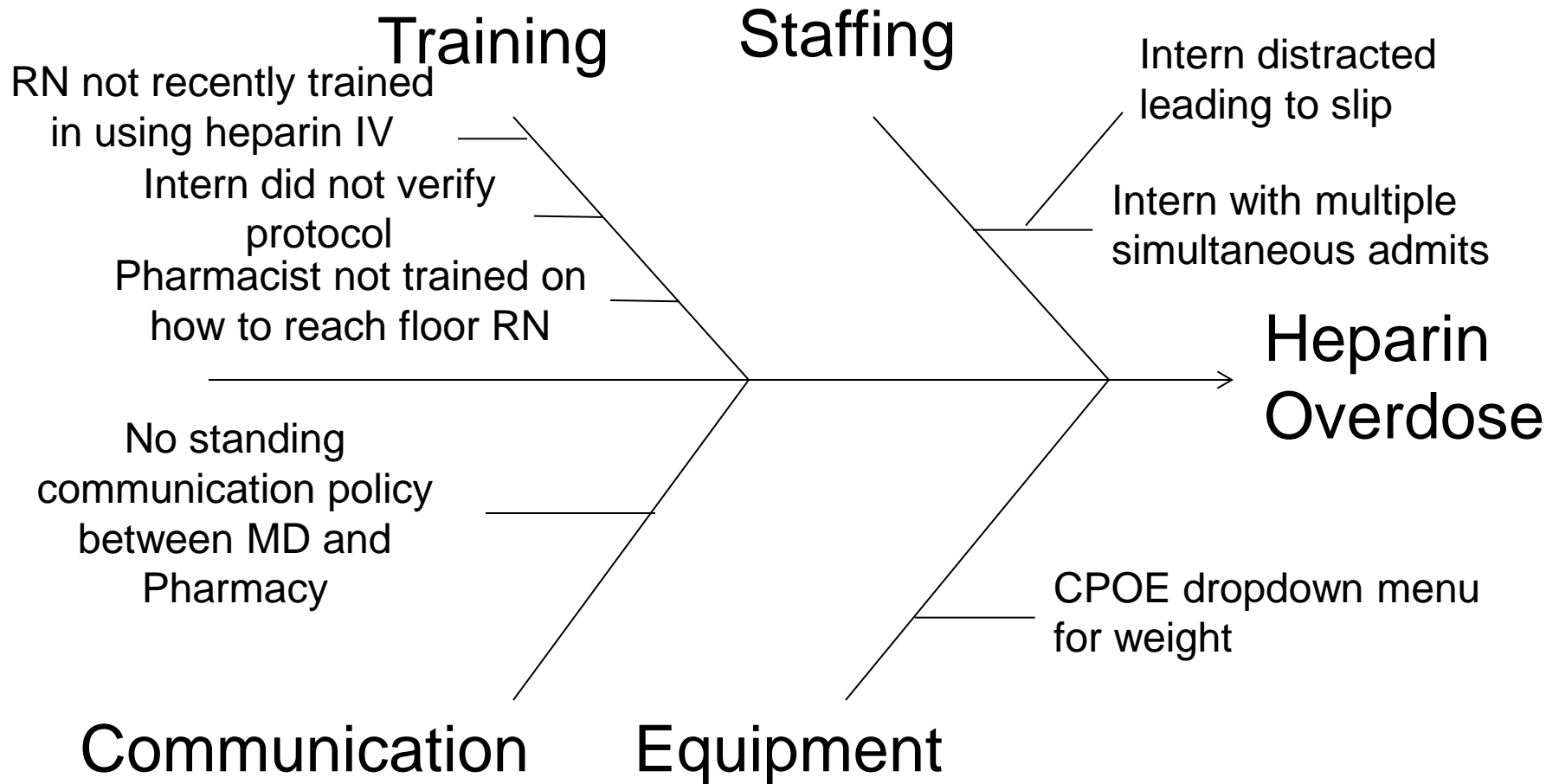


*Reason, J. Human Error*

# 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

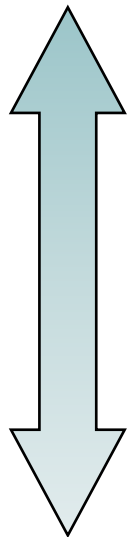
# 5. Making Recommendations & Developing an Action Plan

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**

# Is Your Action Plan Strong, Weak, or Intermediate?

Action Plan	Weak	Intermediate	Strong
1. Write a new hospital policy about how to perform verbal handoffs at end of shift	X		
2. Redesign the med room to keep easily confused meds apart			X
3. Train staff in IV pump use	X		
4. Replace all defibrillators in the hospital with a single model			X
5. Add a checklist for a surgical procedure		X	

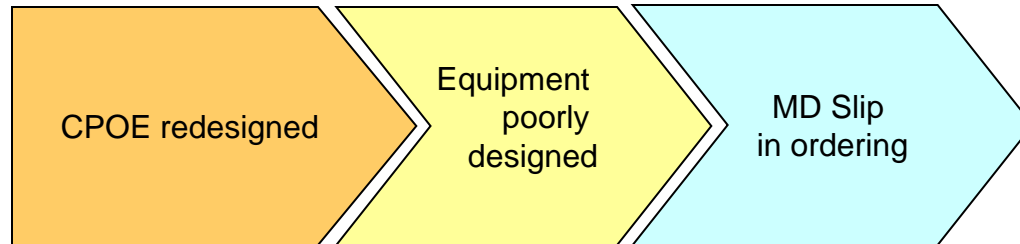
## 6. Making Recommendations & Developing an Action Plan

What system fix(es) might we propose?

Table Top Exercise  
Debrief

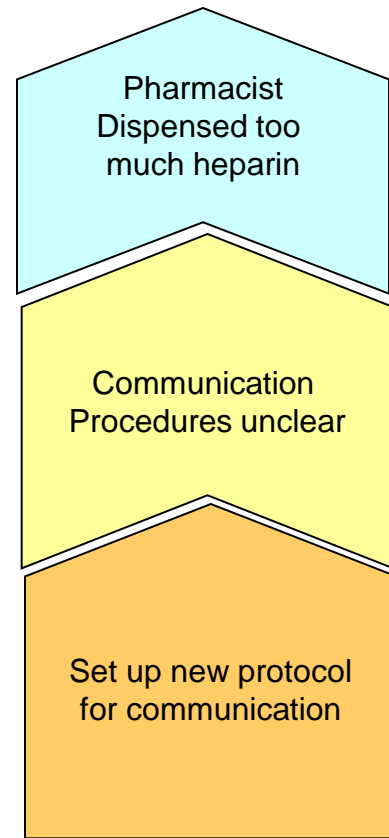
# Interventions

What system fix(es) were proposed?

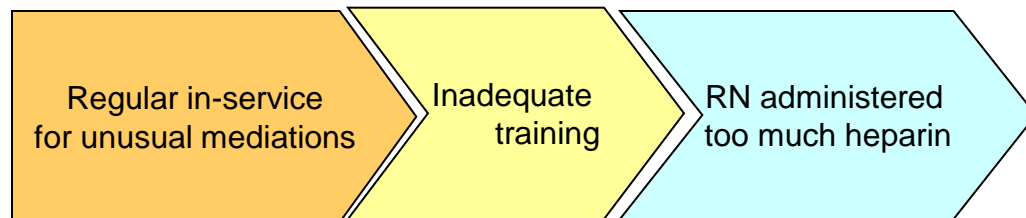


What about the other system failures?

2) Communication procedure unclear (communication failure)



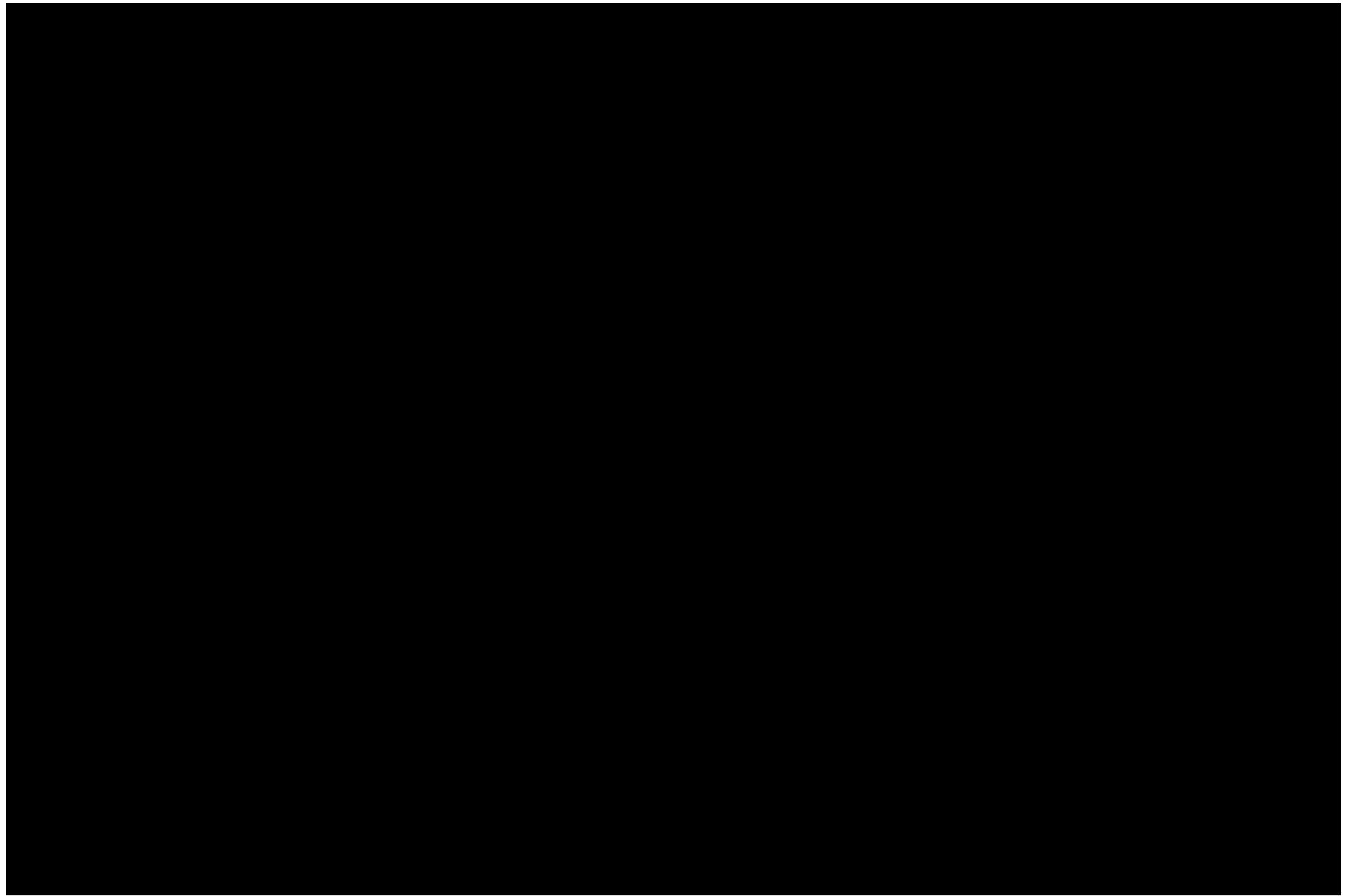
3) Inadequate training/familiarity for heparin



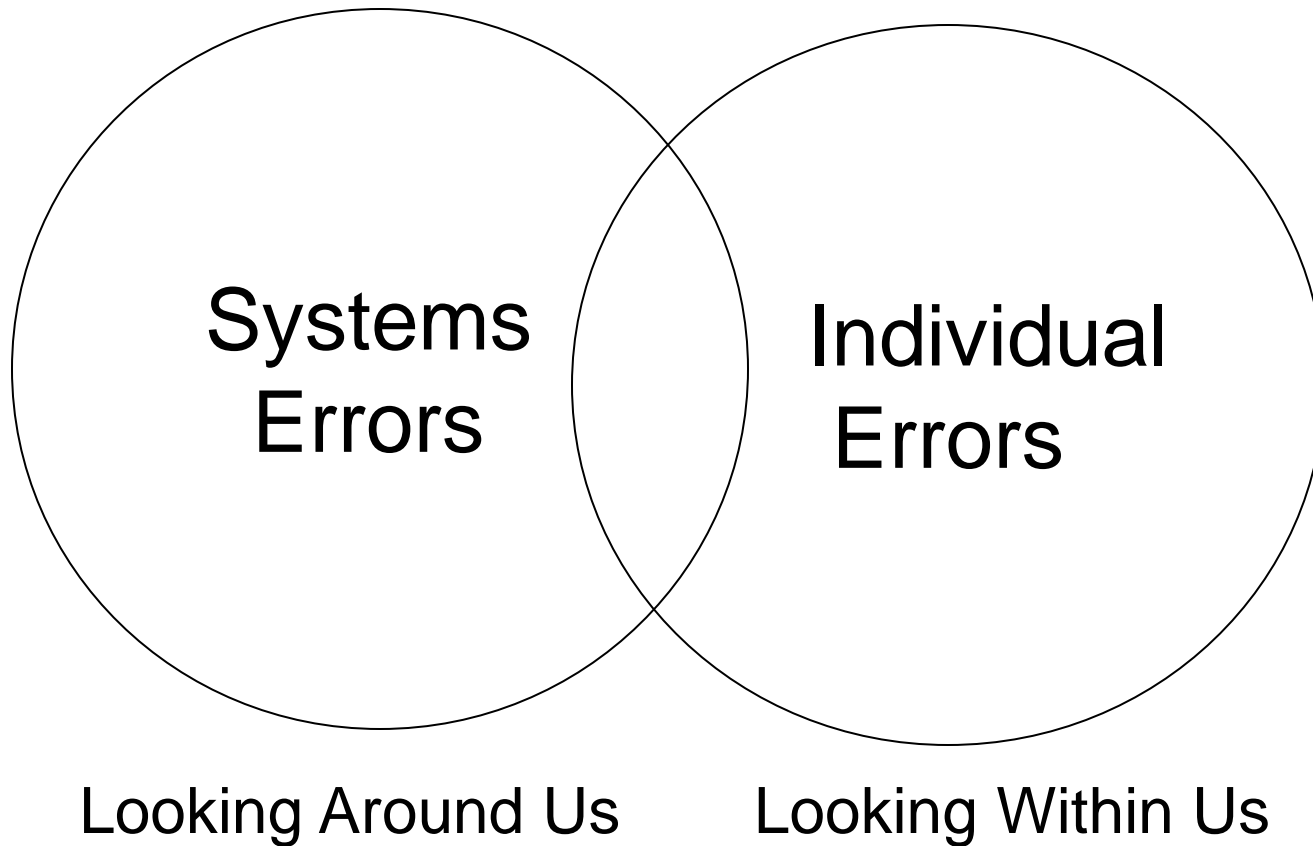
# Our Goals

*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



# Patient Safety is Not Always About the System





# Categories of Error

## System Related

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

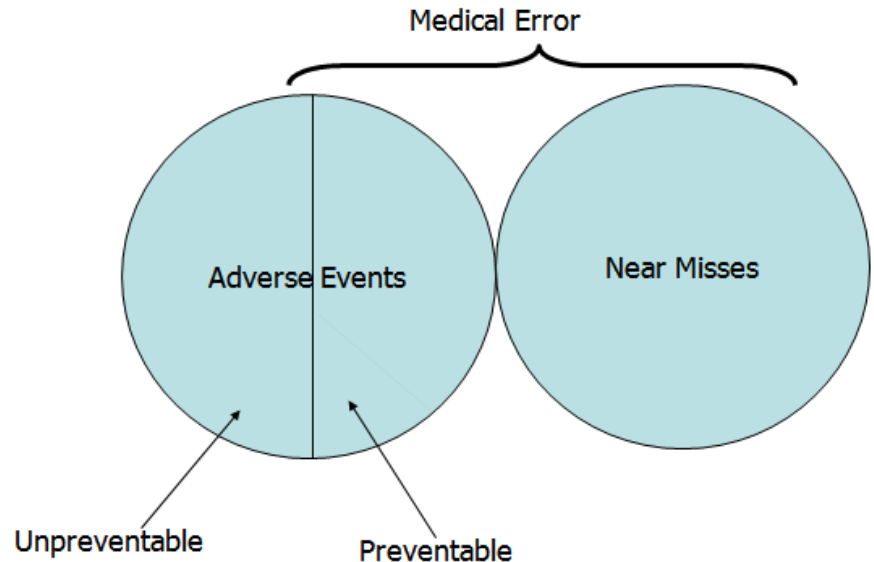
## Individual

- 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

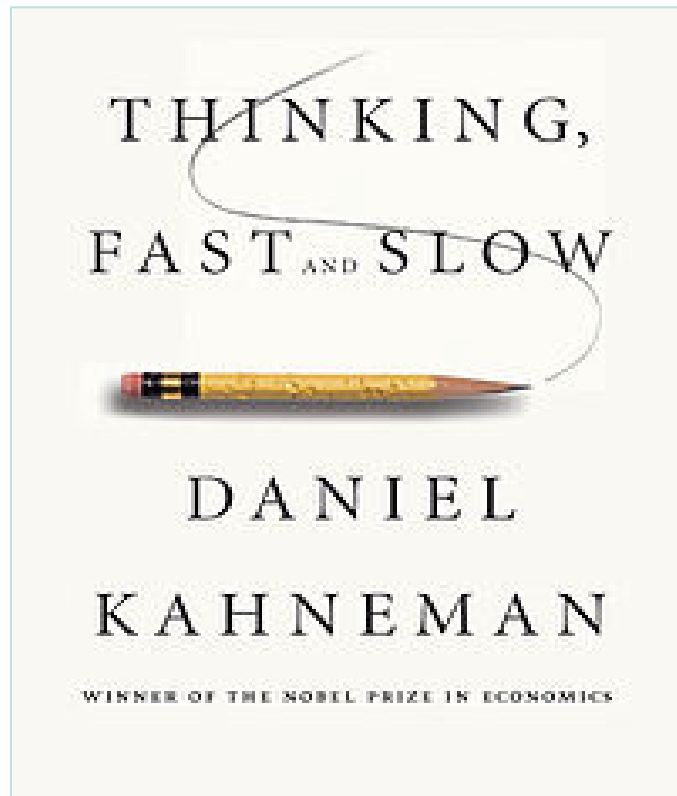
Didn't expand  
your differential  
diagnosis

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

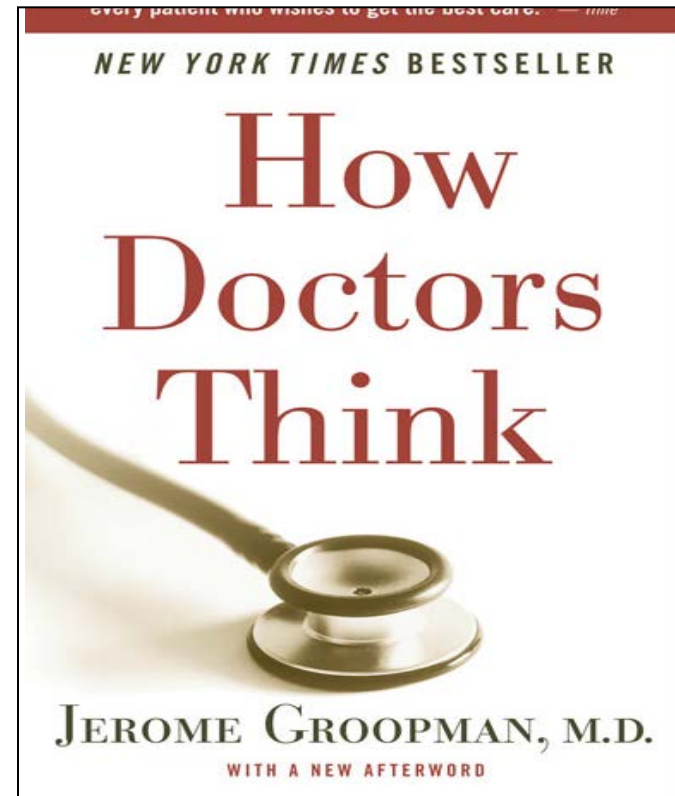
**46%** related  
to both  
Systems and  
Cognitive  
Errors

*Graber ML. Franklin N. Gordon R. Diagnostic error in internal medicine. Archives of Internal Medicine, 2005; 165(13): 1493-9.*

# Thinking About How We Think

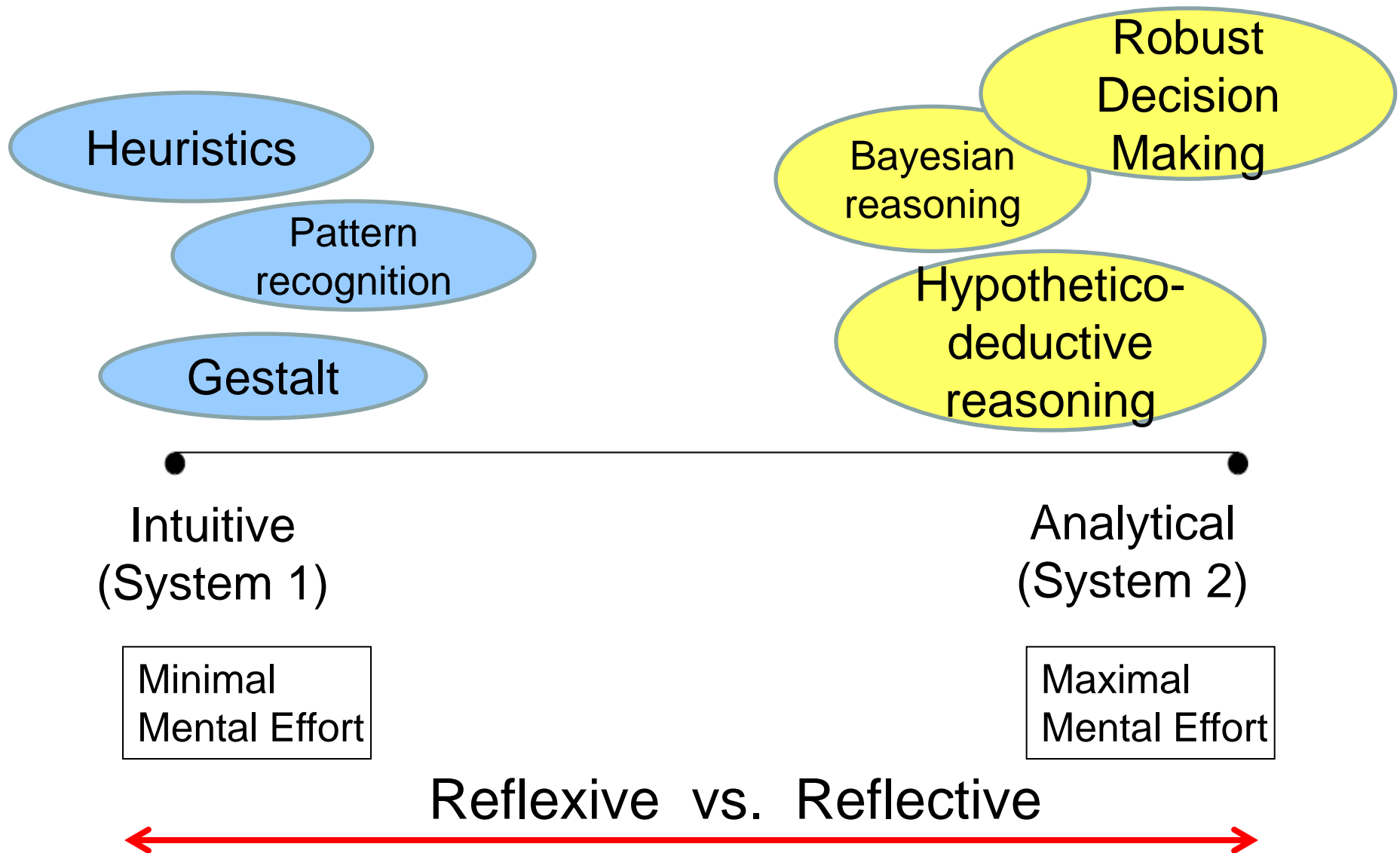


Kahneman and Tversky established the cognitive basis for common human errors, heuristics and biases in 1973



Describes cognitive psychology as it relates to clinical medicine

# The Dual Process Model

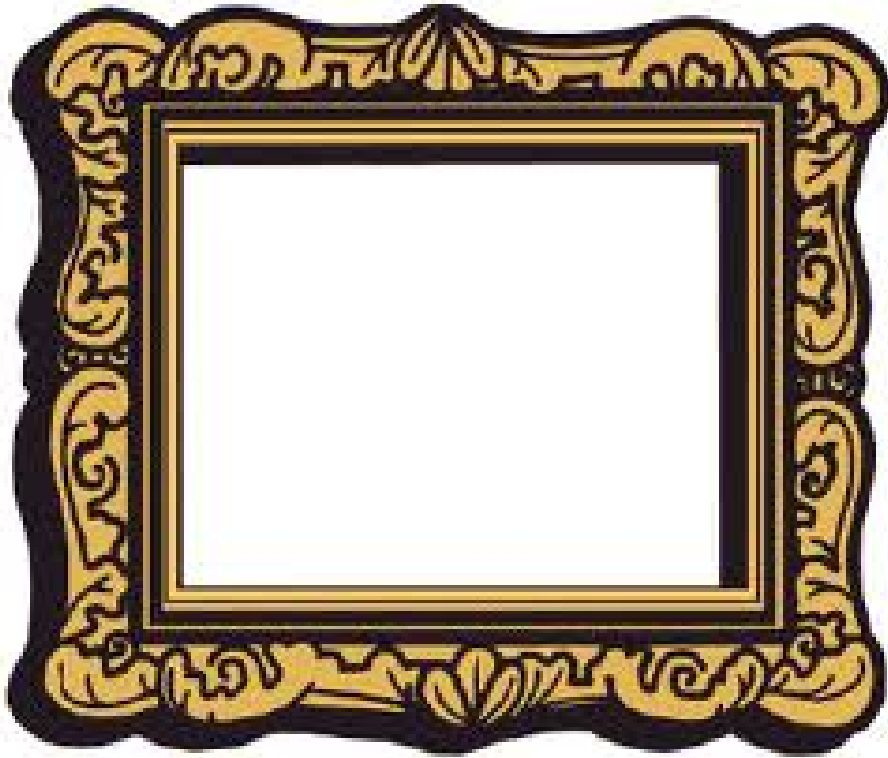


# Anchoring Bias



- 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 IVU

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)

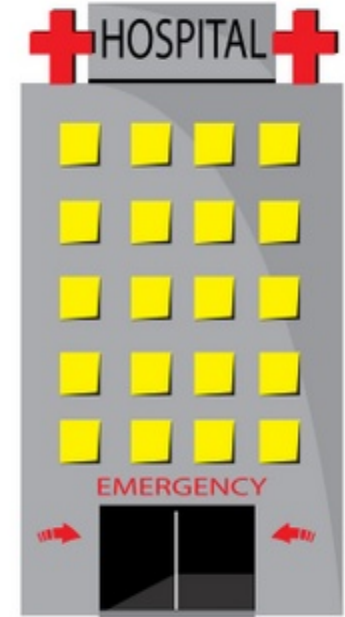
# But What Can I Do to Help Prevent Diagnostic Errors?



In my own  
practice



In my  
residency  
program

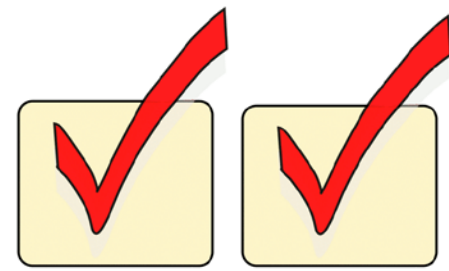


In my  
department or  
hospital

# Within Your Own Practice

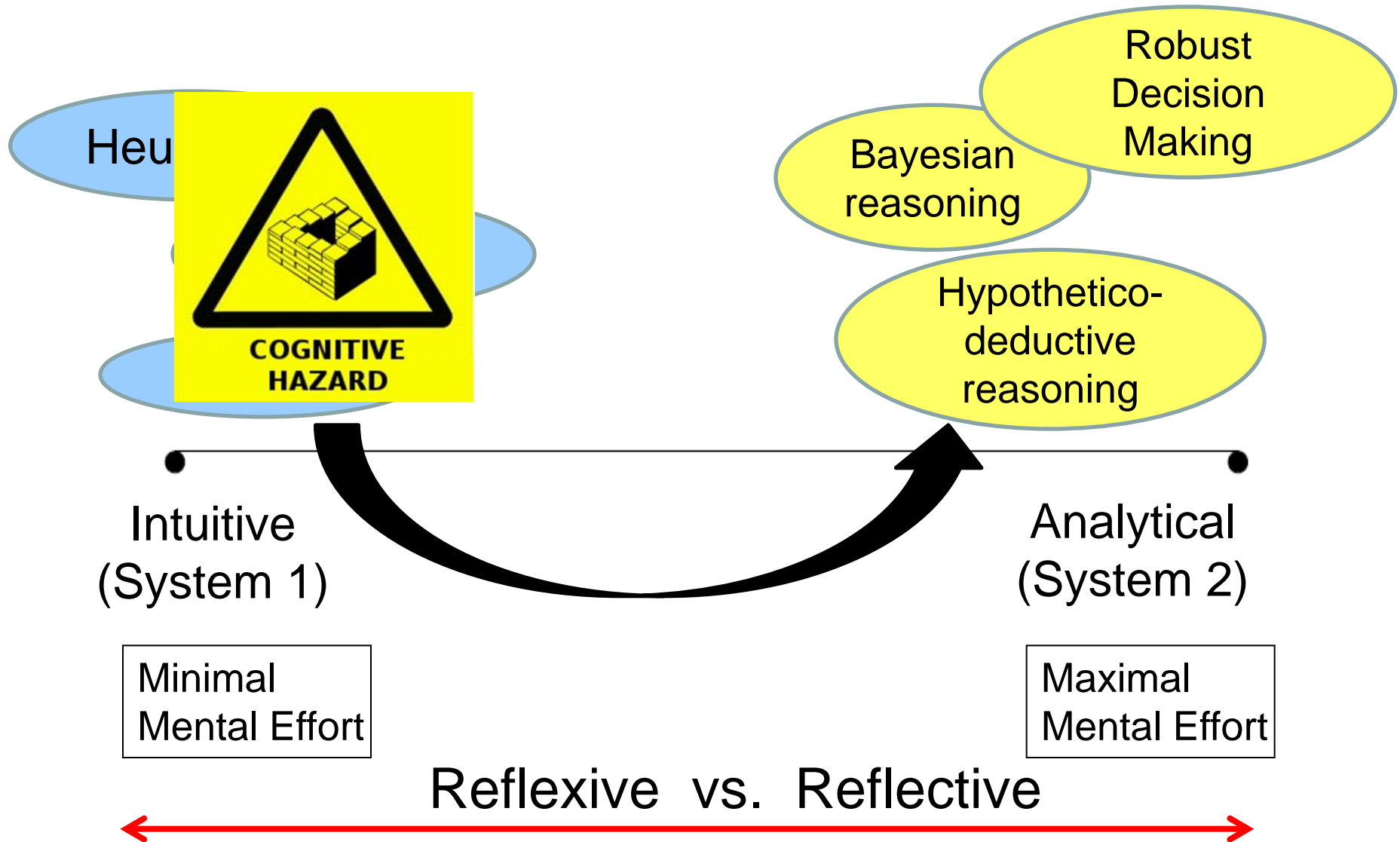


- Reflect on your thinking:
  - Name your “go-to” biases/heuristics and when you use them
- Ask For Feedback
  - “How did that guy do?”
  - “How did you think through or approach the case?”
- Consider these 4 “Double-Check” Questions:
  - Is this a case where I need to “slow down”?
  - What else could it be?
  - What doesn’t fit?
  - Could there be more than one thing going on?





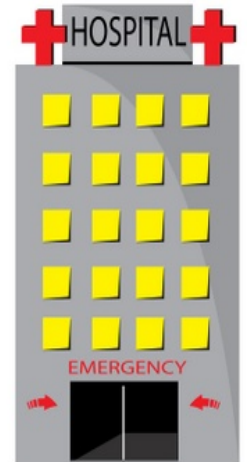
# “Slowing Down When You Should”





# Within Your Residency Program or Hospital

- Become the Expert
  - Use the language (start small)
  - Present/teach the topic to your group at Grand Rounds or other conference
- Refer Diagnostic Errors for Review
  - Event Reporting System
  - Morbidity and Mortality Conference
- TEACH...these concepts
  - Residents, Students, Colleagues, Nurses



# Practice identifying, differentiating, and categorizing systems versus cognitive errors

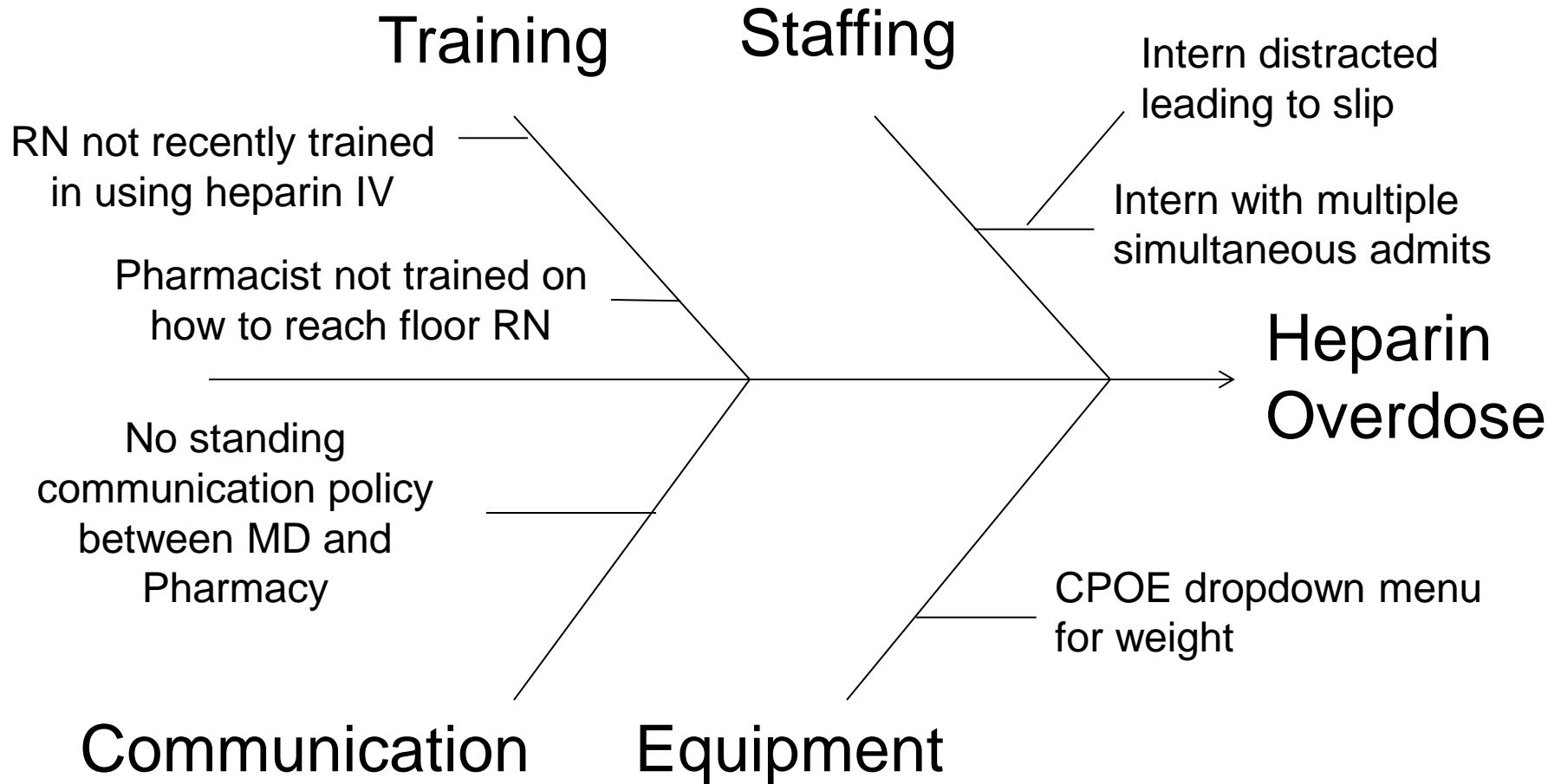
Why are we making you do this?



# Practice at Your Table

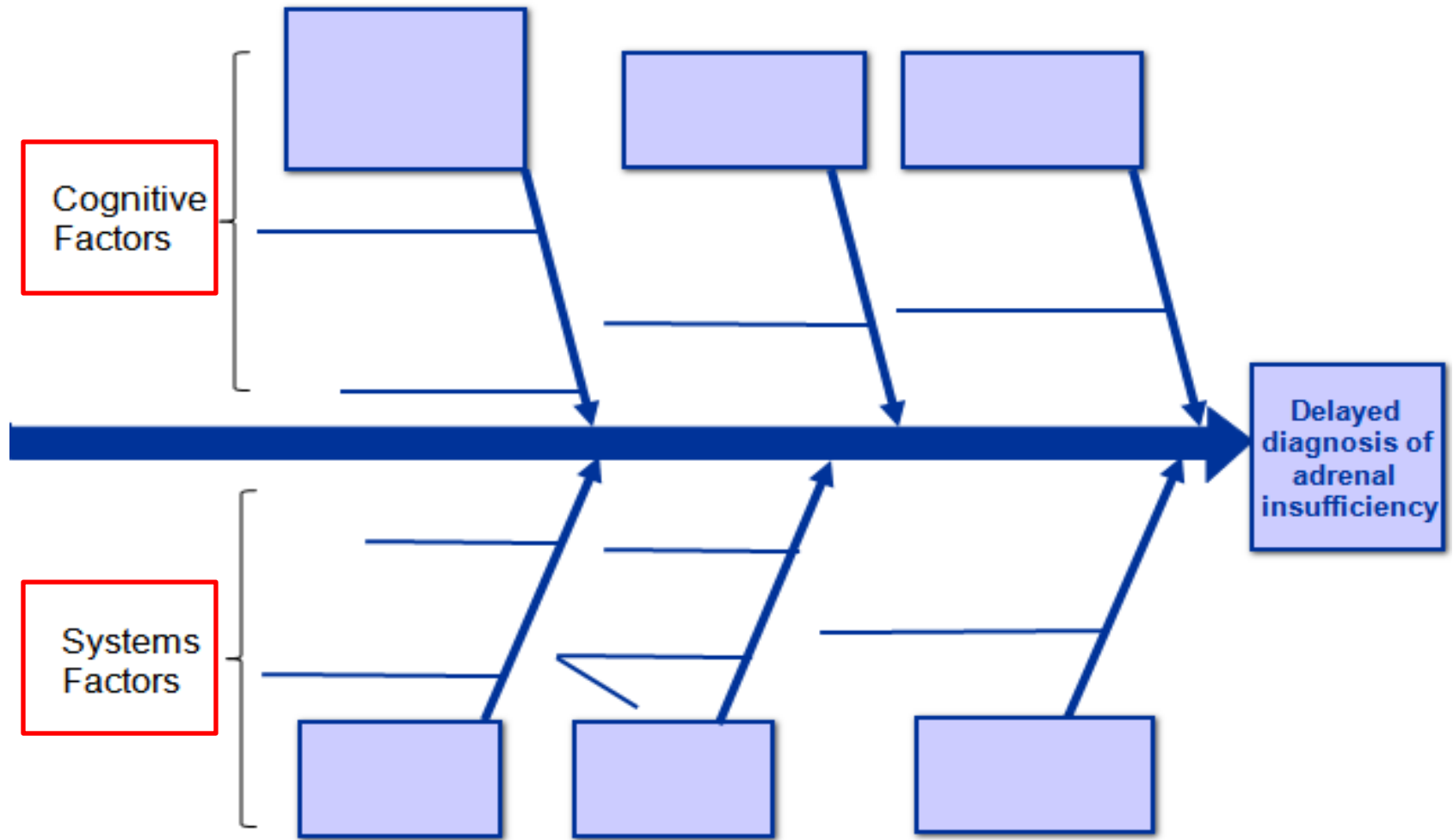
- Choose one person at your table to read the “Delayed Diagnosis of Adrenal Insufficiency” case” out loud
- Fill in the cognitive-systems fishbone naming at least one systems error and one cognitive error

# Cause-Effect Diagram\*



\* Also known as fishbone diagram

# Creating a Different Type of Fishbone Diagram



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# But What About the Resident...



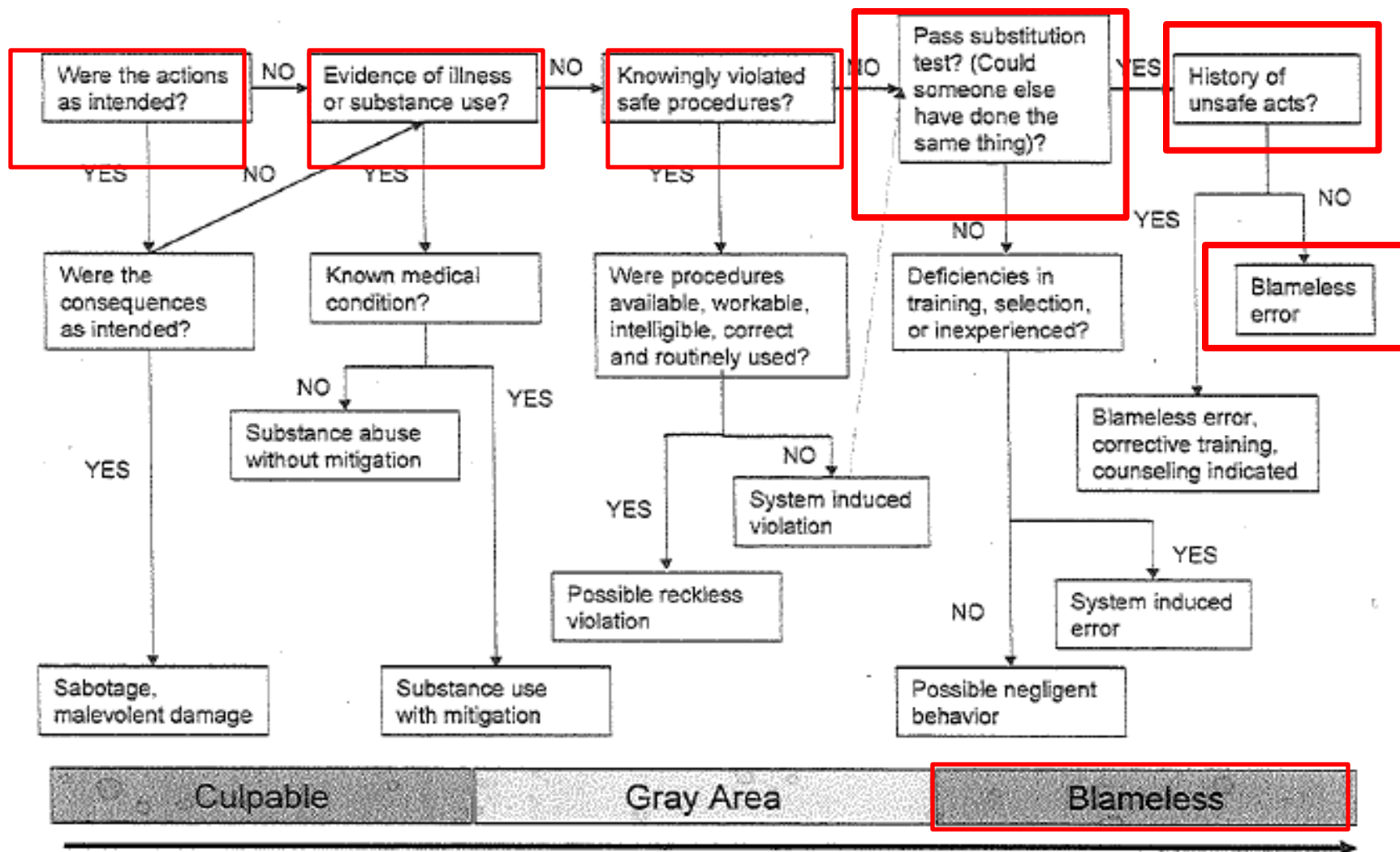
# The Second Victim

“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*



# 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"

# Mistakes That We Have Made

- Keeping a resident “out” of the error/event conversation
- Using email as the primary communication vehicle related to events that involve residents
- Requiring a resident to participate in a root cause analysis or case review
- Not understanding how action plans for safety events get assigned and followed up on at your institution
- Not understanding the difference between a safety conference for education and a safety meeting for error analysis and action planning
- Trying to fix too much, too quickly (think small wins)

# Questions?

