MEDAVIE HealthEd ÉduSanté

Clinical Errors

Primary Care Paramedicine

Module: 09

Section: 04b

Lecture Outline

- Clinical errors and patient safety
  - Swiss cheese model
- Types of errors
- Influences on decision making
  - Ethics
- Barriers to effective critical thinking
  - Cognitive biases
- How to avoid cognitive errors

Clinical Errors

CLINICAL ERRORS & PATIENT SAFETY

Patient Safety and Errors

- Over last few decades, focus on how safe patients are when they are cared for by the healthcare system has increased
- Informed by experiences in other industries, such as aviation, chemical and nuclear industries
  - These industries are high risk
  - Have a strong culture of safety
- These industries studied human factors and system design as ways to reduce the risk of catastrophe

Clinical Errors

- Patient safety occurrences in clinical care are due to:
  - System errors
  - Human errors
  - No fault errors

James Reason Swiss Cheese Model

- Developed in 1990s
- Analysis of major incidents usually reveals multiple small failures lead to the occurrence
- Very important model to further our understanding of how occurrences/errors can happen
- Systems can be improved to reduce the risk of errors by analyzing the safeguards in place

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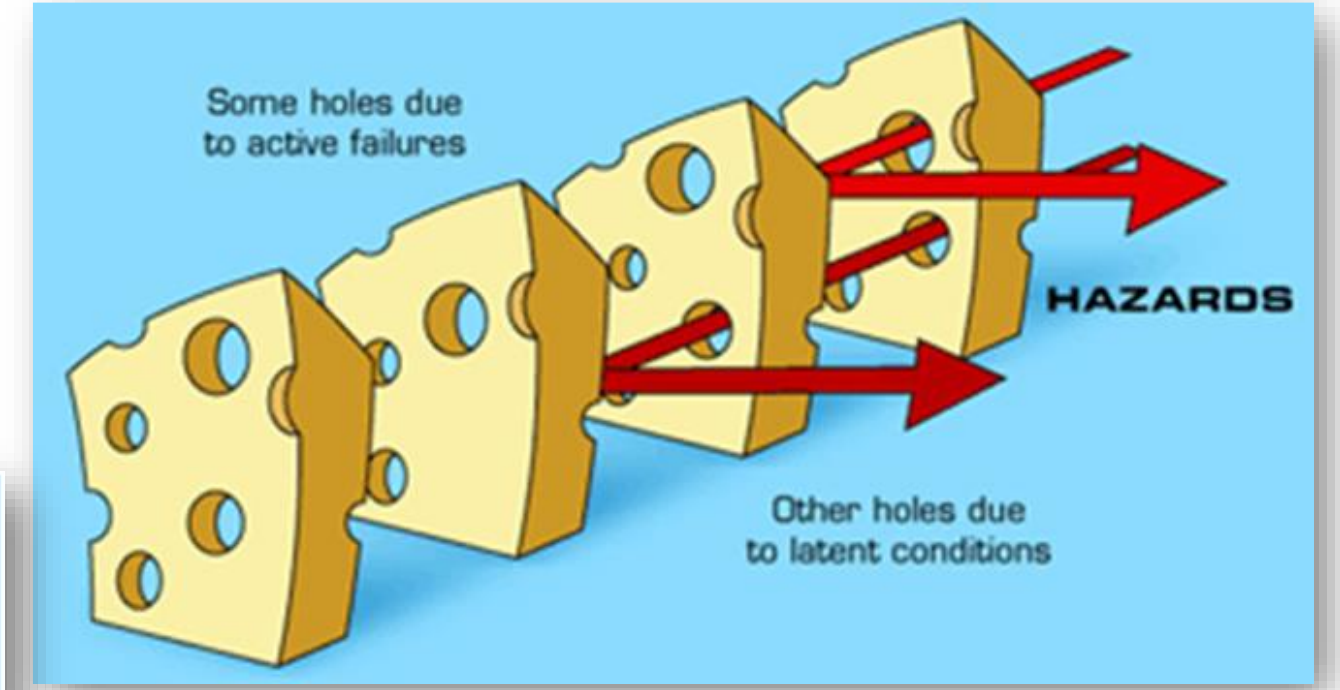
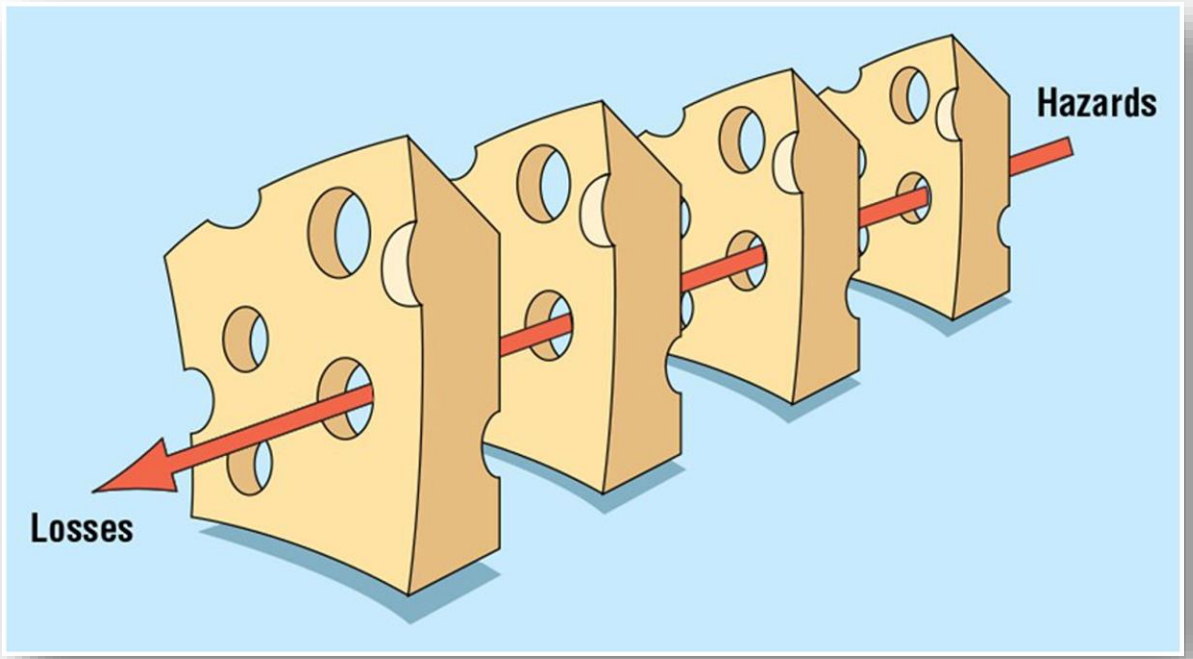
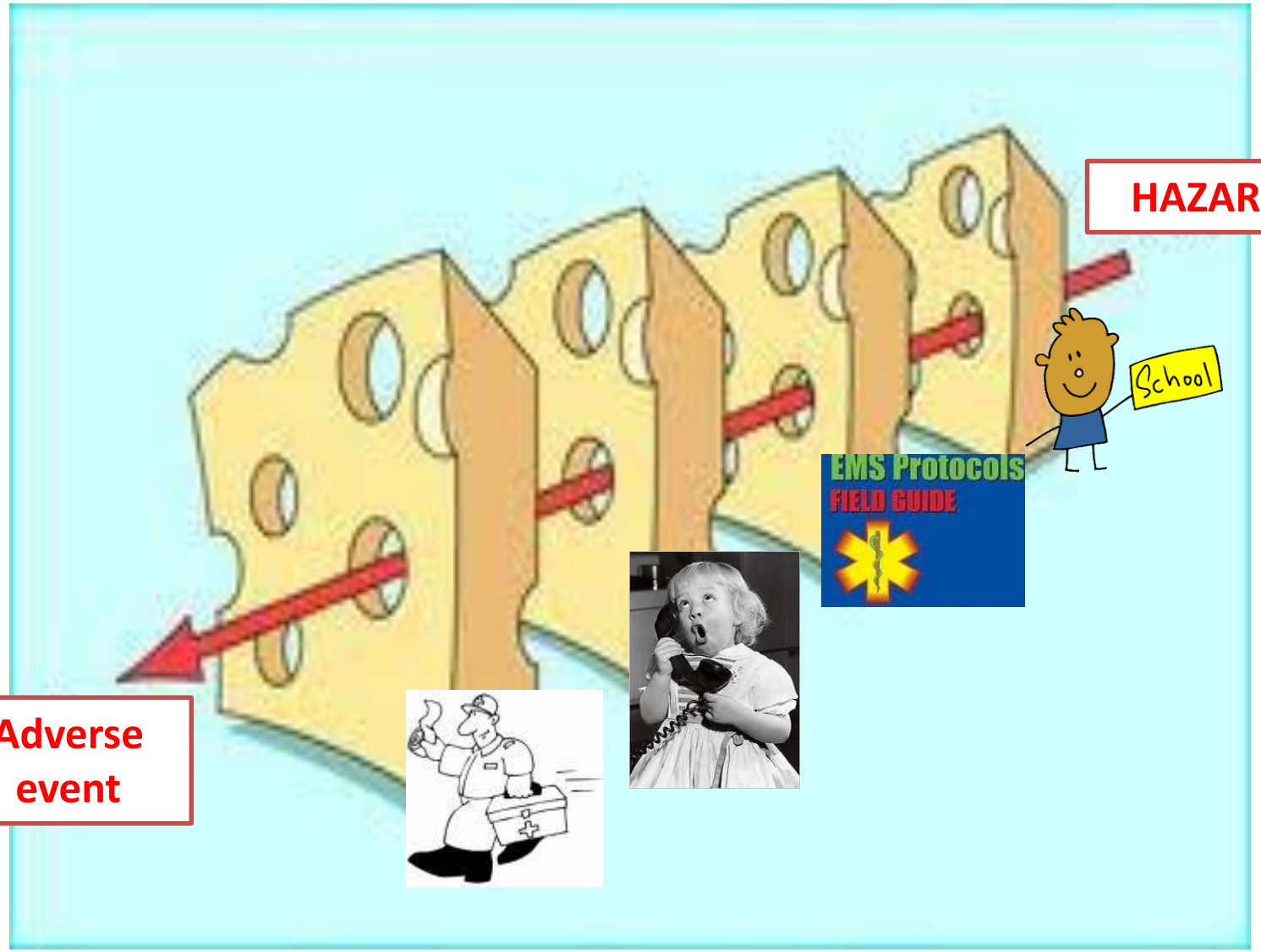
James Reason Swiss Cheese Model





Swiss Cheese Layers

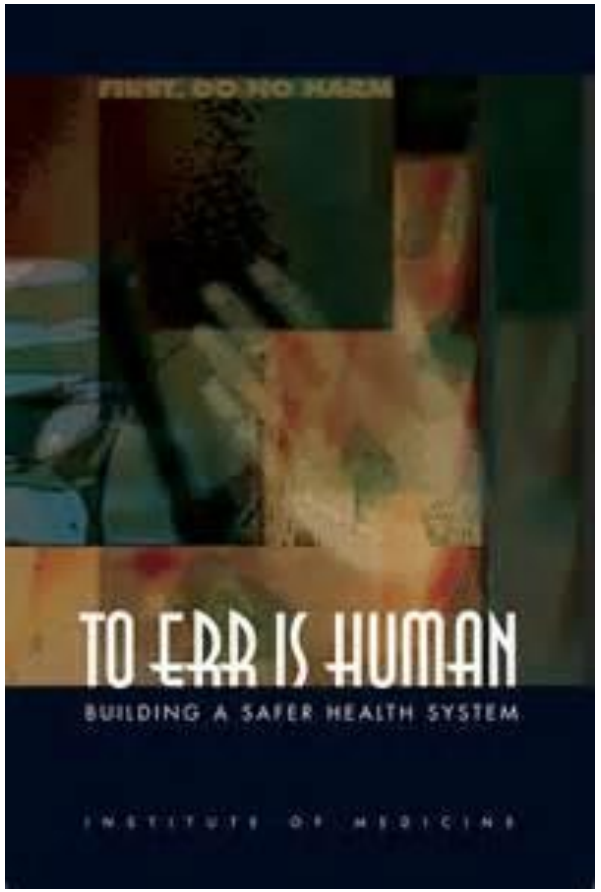
- Safety ‘barriers’ (i.e. things put in place to increase safety) are represented by slices of cheese
  - What are safety barriers in EMS clinical care?
- Every safety barrier has holes. No single layer is error-proof
  - What are examples of holes in those EMS safety barriers?
- When the holes line up, errors can occur
  - What is are examples of clinical errors that can occur during EMS care?



Reason J, 1990

Errors in Healthcare: USA

- US Institute of Medicine 1999 report ‘To Err is Human’
  - Special report on patient safety
  - 100,000 preventable deaths/year in the US
- Cast a huge light on patient safety issues
- Investment in patient safety jumped



Adverse Events in Healthcare: Canada

- Estimated overall rate of adverse events is 7.5% = 2.5 million AEs/year in Canada
  - 70,000 of AEs are preventable

Research

Recherche

The Canadian Adverse Events Study: the incidence of adverse events among hospital patients in Canada

G. Ross Baker, Peter G. Norton, Virginia Flintoft, Régis Blais, Adalsteinn Brown, Jafna Cox, Ed Etchells, William A. Ghali, Philip Hébert, Sumit R. Majumdar, Maeve O'Beirne, Luz Palacios-Derflingher, Robert J. Reid, Sam Sheps, Robyn Tamblyn

CMAJ 2004;170(11):1678-86

Canadian Patient Safety Institute

- Established by Health Canada in 2003, as a result of a national committee which published a report in 2002 ‘Building a Safer System’
- Advances patient safety in Canadian healthcare
- Multidisciplinary

www.patientsafetyinstitute.ca

cpsi icsp Canadian Patient Safety Institute
Institut canadien pour la sécurité des patients

Clinical Errors

TYPES OF ERRORS

Clinical Errors

- Not all errors are the same, and each may have different underlying mechanisms, occur in different parts of the organisation or require different methods of risk management to avoid them
- Error types
  - Execution failures
  - Planning or problem solving failures

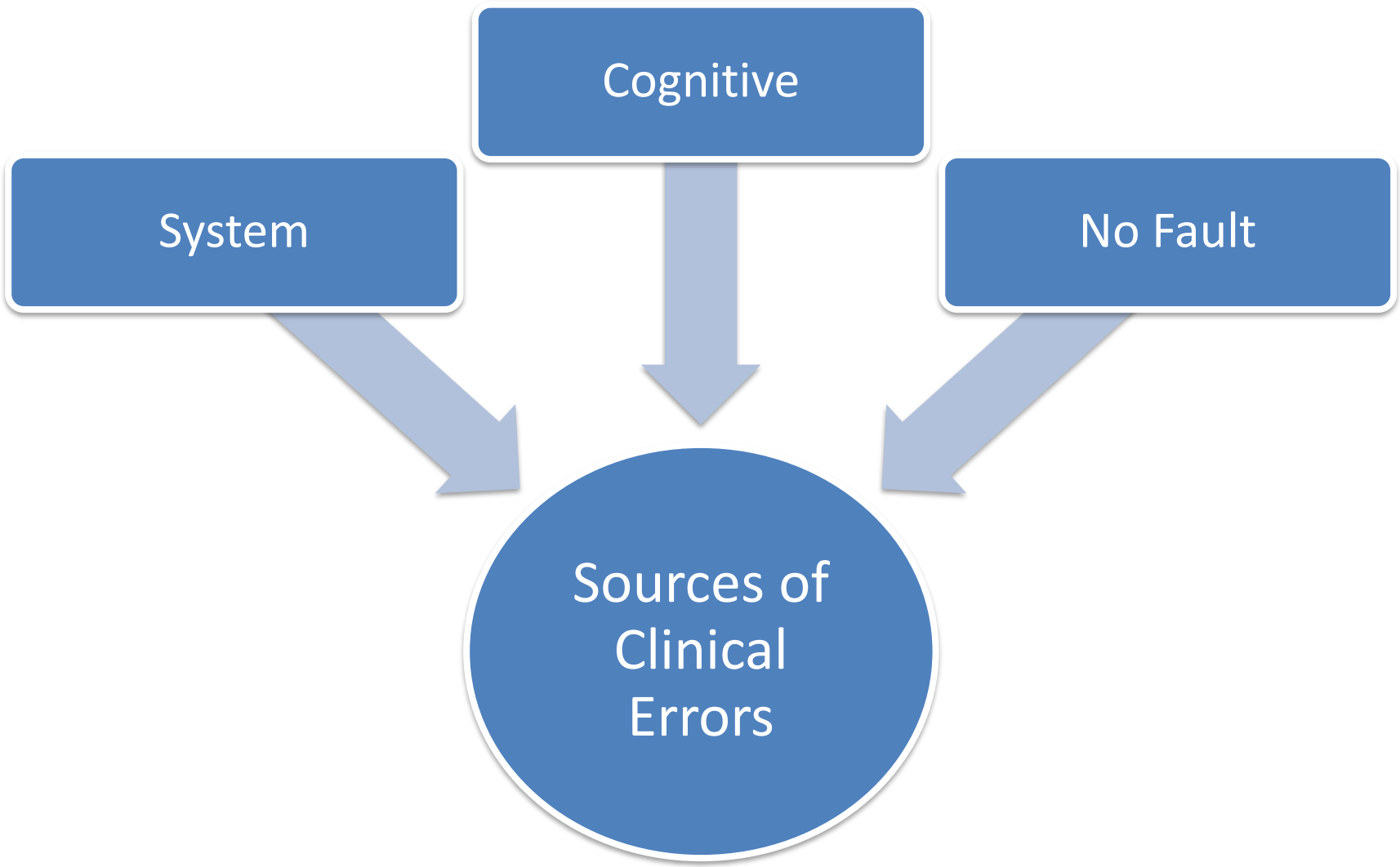
Errors in Clinical Care: Definitions

- Occurrence/Incident – an unintended event that is inconsistent with routine practice or quality of patient care. It may lead to an adverse outcome.
- Near Miss – potential for harm exists, but does not because an intervention was successful

Errors in Clinical Care: Definitions

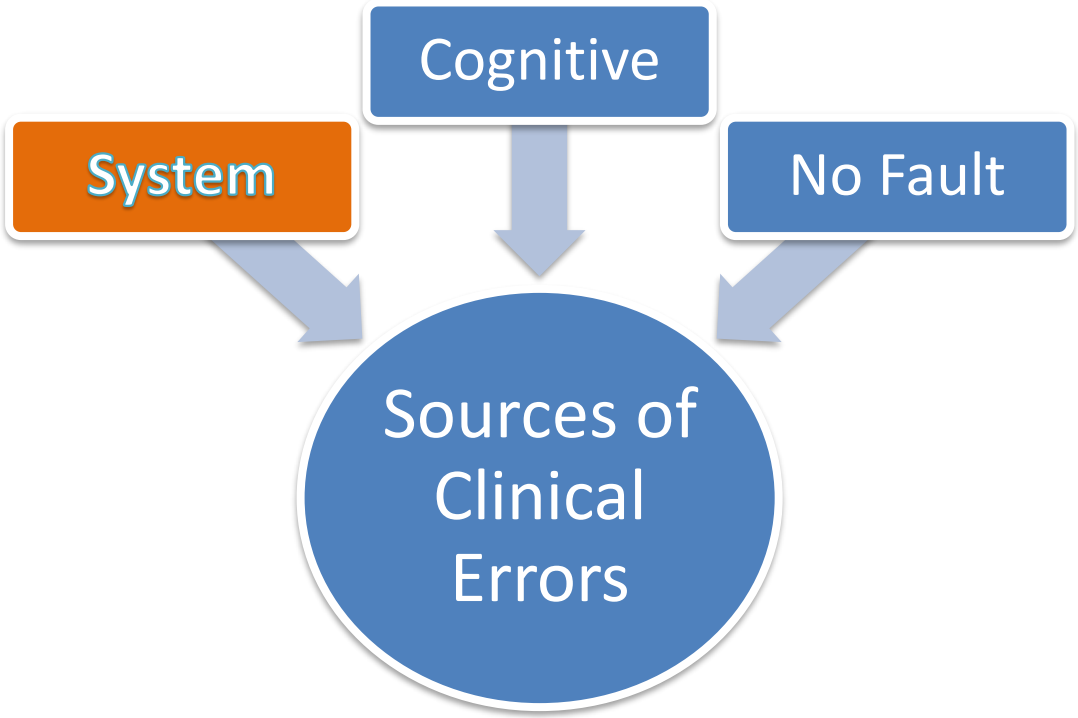
- Adverse Event – An occurrence that had demonstrable impact on the quality of patient care
- Adverse Outcome – an occurrence with measurable injury (there are several scales for the different levels of harm/injury)

Sources of Clinical Occurrences



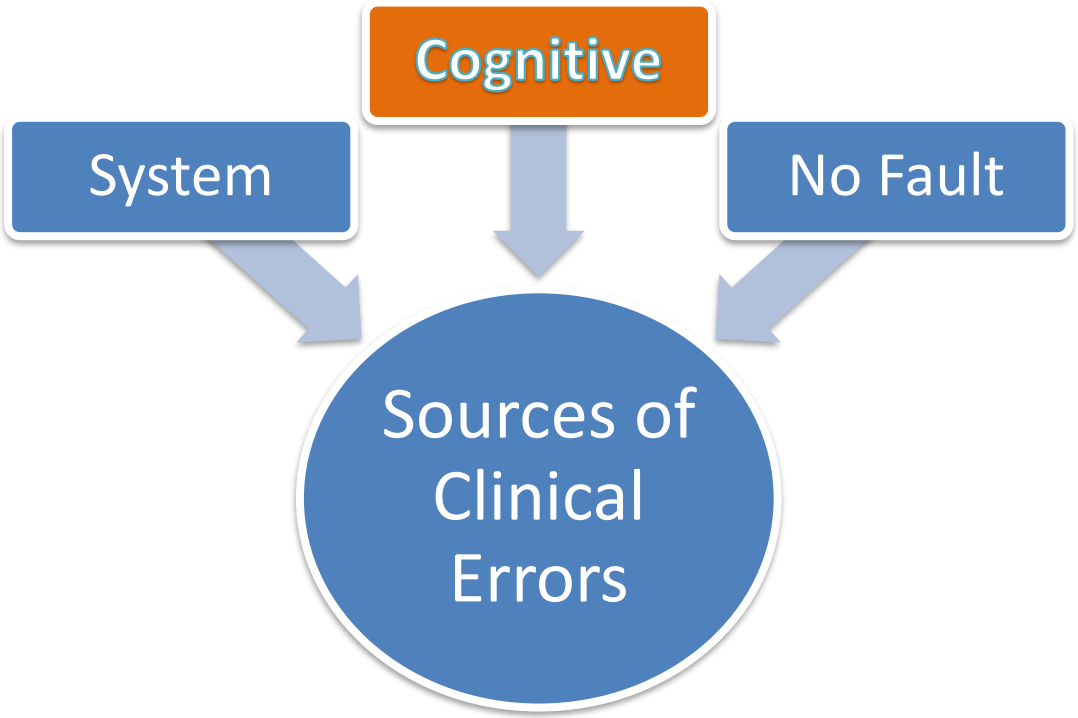
System

- What are examples of EMS System factors that lead to clinical occurrence?
- Error producing conditions
- Time delays
- Equipment failures



Cognitive

- What are examples of paramedic cognitive factors that lead to clinical occurrence?



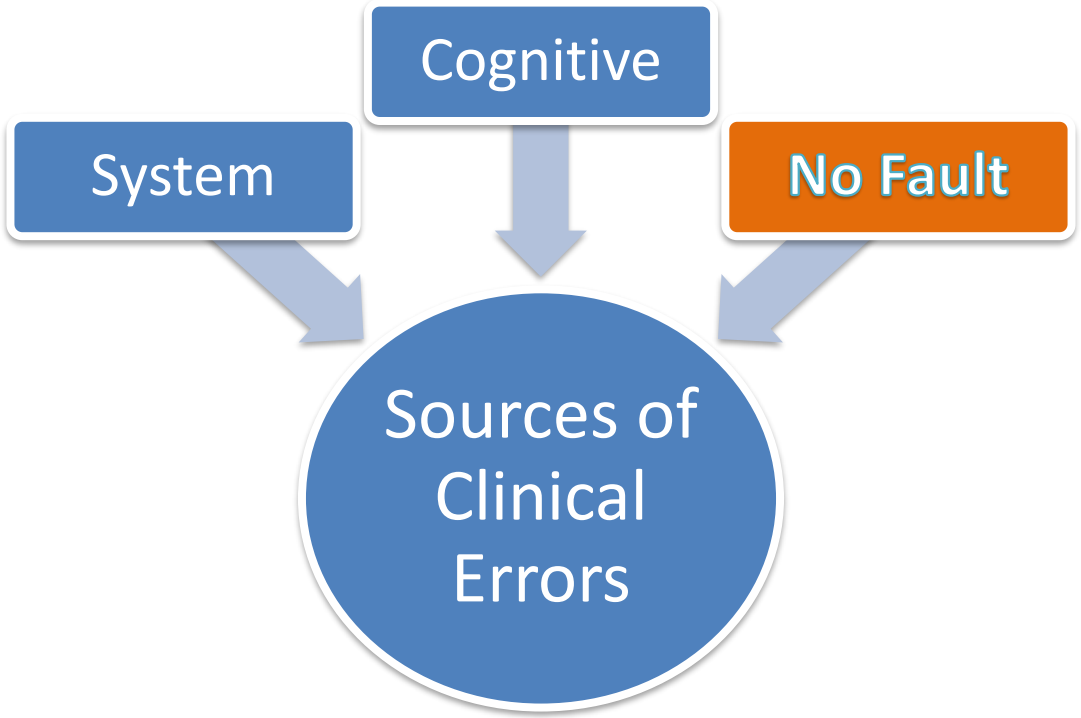
- Flawed or inefficient thinking processes
  - Knowledge deficiencies
  - Incomplete Data Gathering
  - Medication errors
    - Dosage
    - Administration error
  - Test misinterpretation
  - Cognitive Biases

Mistakes

- Rule based mistakes
  - Misapplication of a good rule
  - Application of a bad rule
  - Non-application of a good rule
- Knowledge based mistakes
  - A novel problem where the solution has to be worked out
  - Step two reasoning based on an incomplete or inaccurate information that is subject to cognitive biases

No Fault

- What are examples of No Fault factors in EMS that lead to clinical occurrence?

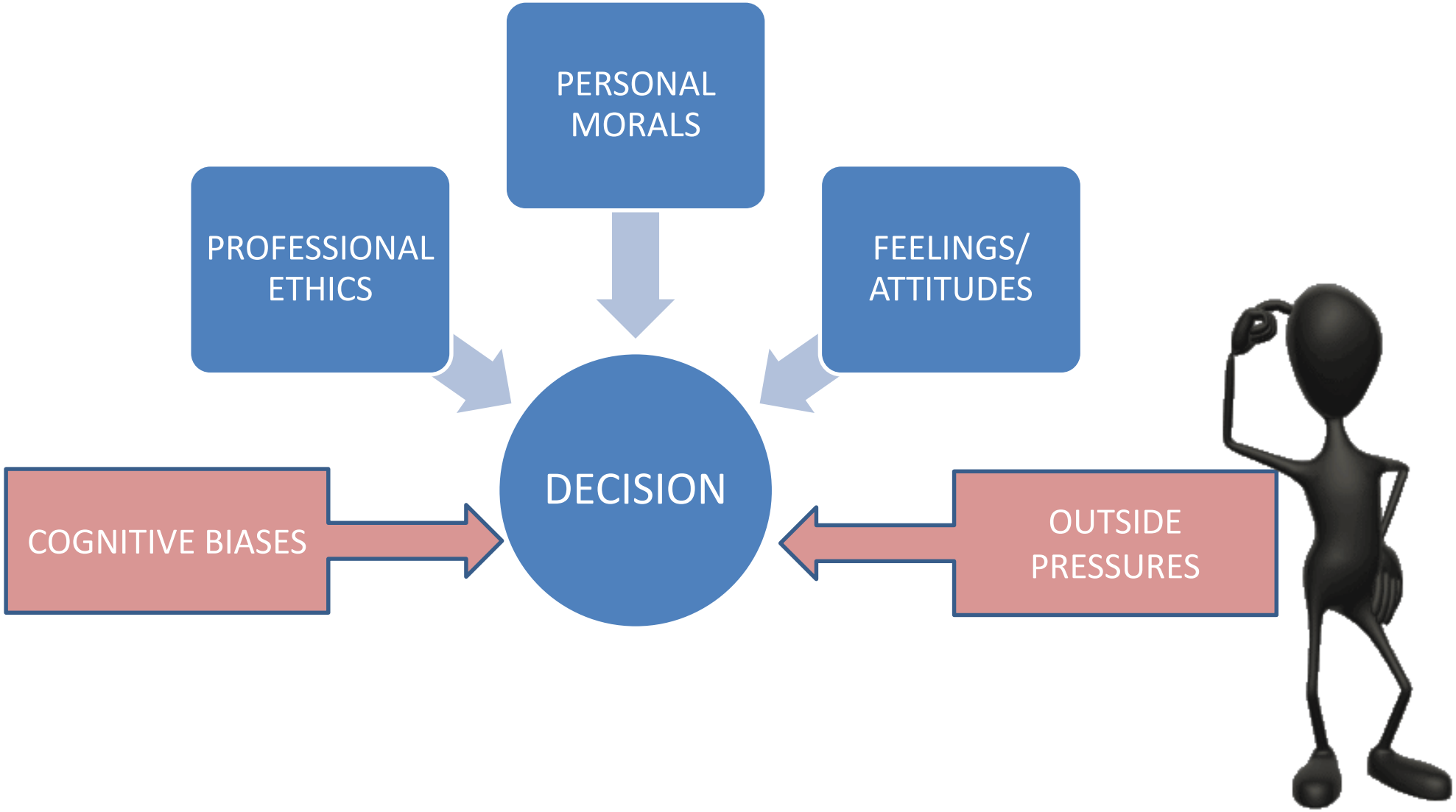


- Considered unavoidable
  - Unreliable information from the pt
  - Somatoform disorders
    - Physical complaint with no physiological cause (psych)
  - New/Rare Disorder
  - Pt refuses diagnostic assessment
  - Silent presentation of co-morbid illness (silent MI)

Clinical Errors

INFLUENCES ON DECISION MAKING

Influences on Decision-Making



Ethics, Morals & the Law

ETHICS

Rules or standards the govern the conduct of members of a particular group/profession

MORALS

Personal standards of right and wrong, influenced by social, culture, religious factors

LAWS

Rule of conduct or action prescribed or ***formally recognized and enforced*** by controlling agency

Ethics and Decision Making

- Clinical decision making often requires ethical consideration.
- The Four Ethical Pillars:
  - Autonomy
    - Patient's self-determination
  - Beneficence
    - Do good for the patient
    - Benefit the sick by preventing and removing harm
  - Nonmaleficence
    - Do no harm to the patient
  - Justice
    - Do what is fair for your patient and others
      - Principle of Triage

Clinical Errors

BARRIERS TO EFFECTIVE DECISION MAKING

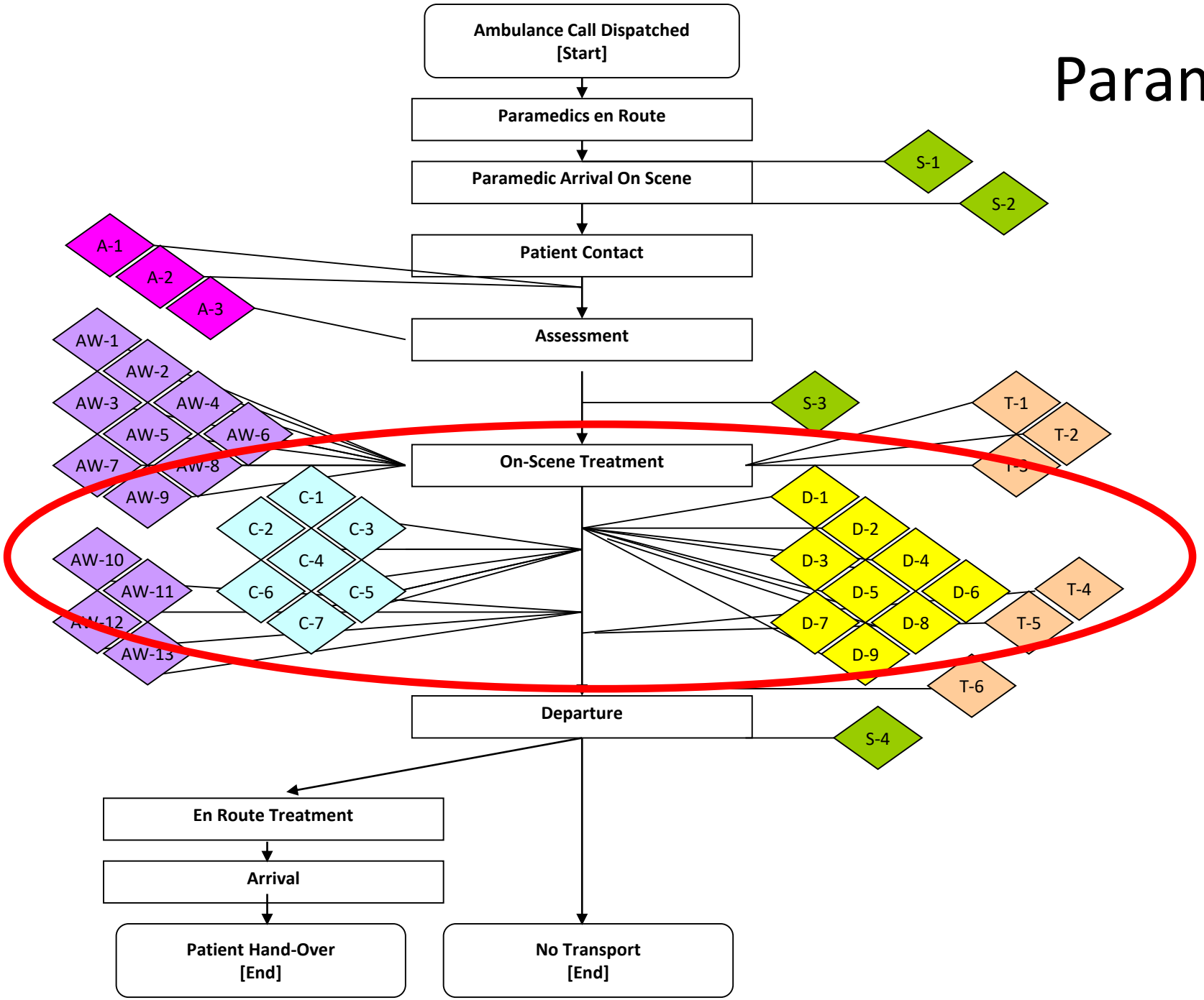
Barriers to Decision Making

- Decisions are made System 1 or System 2
- Different factors can affect how well decisions are made:
  - Setting
    - Thinking in chaotic, unpredictable or fast paced environments
  - Affective Dispositions to Respond
    - Emotions of the clinician
  - Cognitive Dispositions to Respond
    - Otherwise known as ‘biases’. Characterize everyday thinking. Factors that affect thinking

Challenges to Decision Making in the EMS Setting

- The settings in which paramedics care for patients can impact the decisions paramedics make.
- Setting-related factors include:
  - Time
    - Fast-paced environment
    - Urgent/emergent decision making
    - Narrow windows
  - Patient Condition
    - High risk decision making
    - High uncertainty
    - Incomplete data/patient information
  - Available clinical expertise
    - Varying levels of training and experience
    - Additional help may take time
    - Cumbersome to contact online
  - Decision Density
    - Multiple decisions in short period
    - Likely during ‘on scene’ phase

Paramedic Decision Density



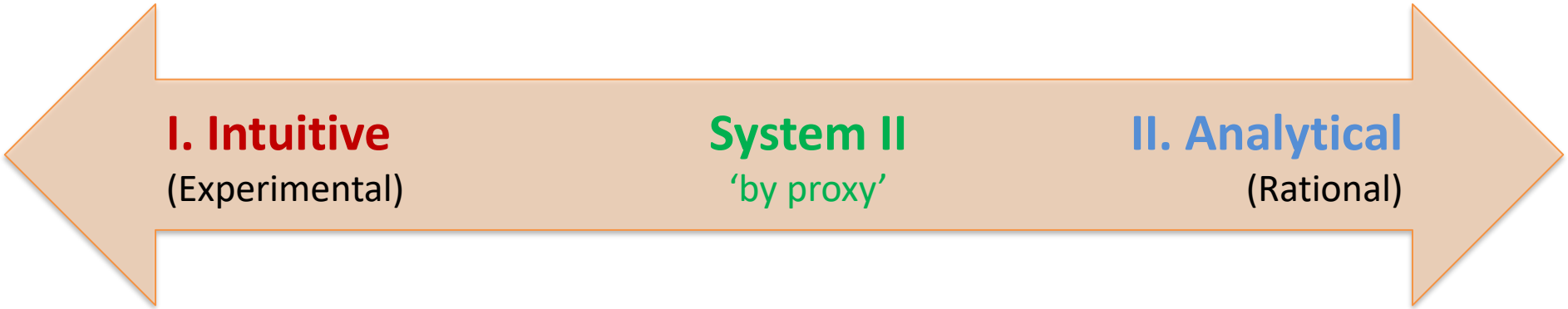
Symbol	Meaning
S	Scene Management Decisions
A	Assessment Decisions
T	General Treatment Decisions
AW	Airway Management Decisions
C	Cardiac Management Decisions
D	Drug Administration Decisions
	Terminal (Start, End)
	Processes

"Biases"

- Biases are mental phenomena that characterize everyday thinking
  - A tendency or inclination the precludes consideration of an issue
  - Inclination to favor a particular perspective at the expense of others
- The word 'bias' has a negative connotation
- Some biases are heuristics – mental shortcuts, which are helpful in thinking

Biases & Decision Making

- Affective and cognitive dispositions to respond are more likely to affect System 1 thinking than System 2



- Clinicians can become more aware of this by reflecting on decision making and through training

Cognitive Biases

- Biases can be put in two rough categories
  - Affective dispositions to respond
  - Cognitive dispositions to respond
- Biases themselves usually happen unconsciously (System 1)
  - System 2 should serve as a check-point to ensure biases aren't negatively influencing decisions
  - Requires meta-cognition

Affective Dispositions to Respond

- Affect = mood/emotion
- Clinician unconscious emotional reactions to a patient or circumstance can affect decisions
- How patient is perceived:
  - Difficult patients (e.g., intoxicated, personality disorders)
  - Patient's setting
  - Communicable diseases
  - Societal groups
    - Links back to ethical principle of justice
    - Be aware of discrimination

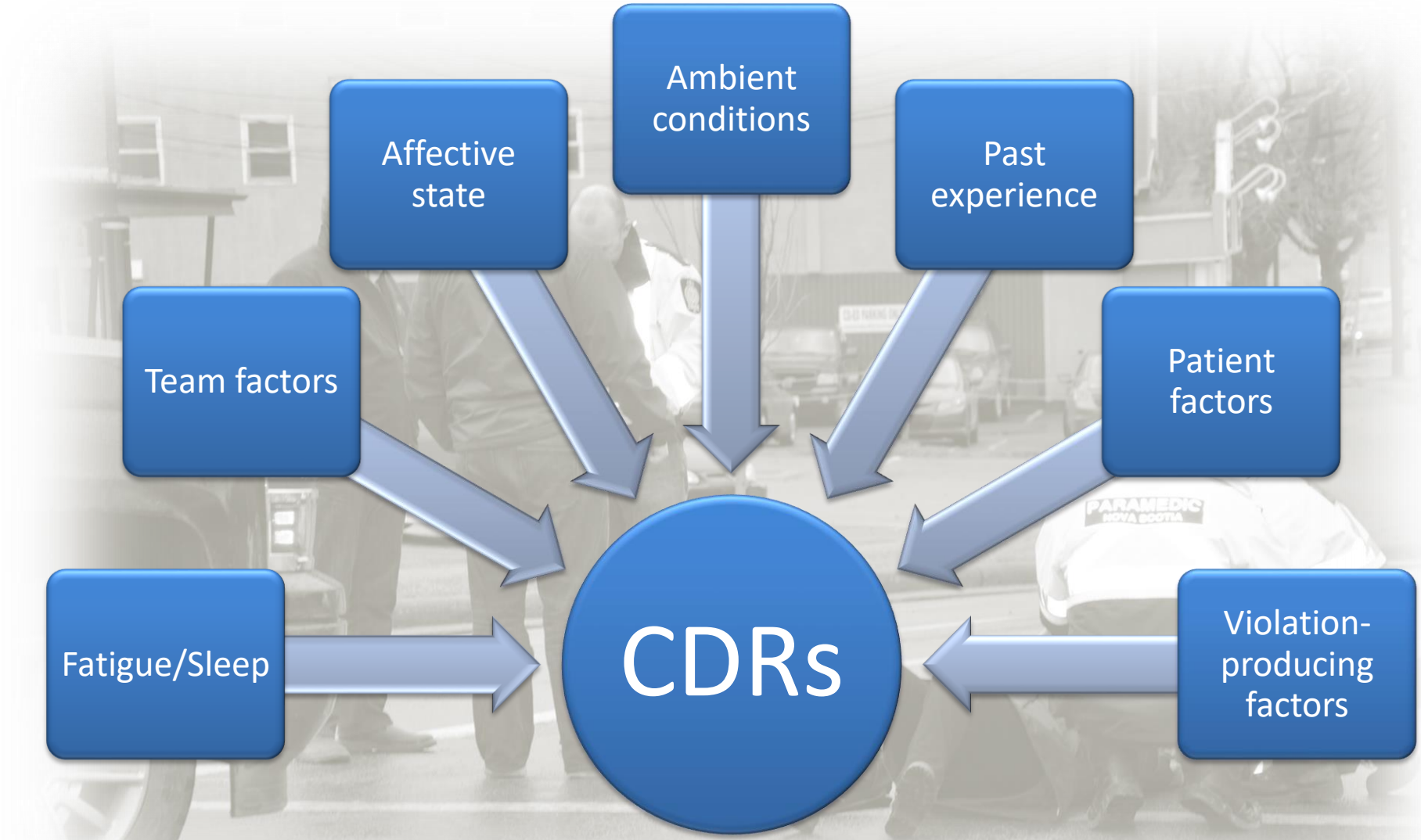
Affective Dispositions to Respond

- Emotional state of the clinician can affect decision making
  - Fatigue
  - Mental health of clinician
    - Depression
    - Mania, other emotional dysregulation
    - Anxiety
  - Emotional attachment to patient situation
- One must have good self awareness to fully understand their own thinking through meta-cognition

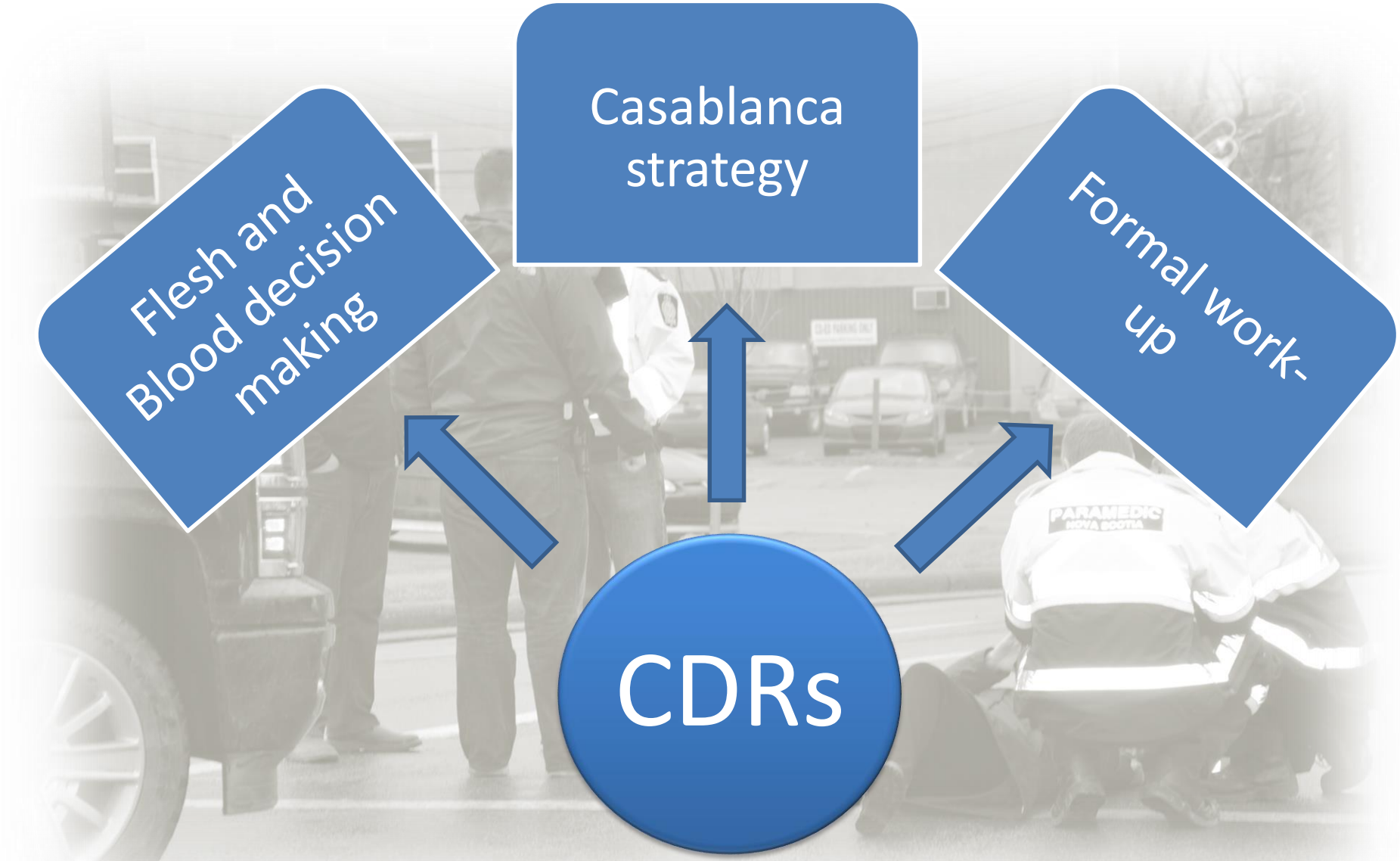
Cognitive Dispositions to Respond (CDR's)

- Diagnoses can be clear and straight forward such as a fracture, foreign body, anaphylaxis, etc.
- But when the diagnosis is unclear or you are uncertain there are a variety of factors that affect our reasoning skills
- The summation of their effects leads to at least one CDR
- This is reflected in a final common cognitive pathway and action
- May be correct or not

Cognitive Dispositions to Respond (CDR's)



Cognitive Pathway Response



Cognitive Dispositions to Respond

- What is commonly referred to as cognitive biases
- Over 100 different cognitive biases have been described
- Affect all thinking, not just clinical decision making
- The ones presented here may be most common in paramedic practice

CDRs Related to:

- Over-Attachment to a Particular Diagnosis
  - Anchoring bias
  - Confirmation bias
  - Sunk costs

Anchoring Bias

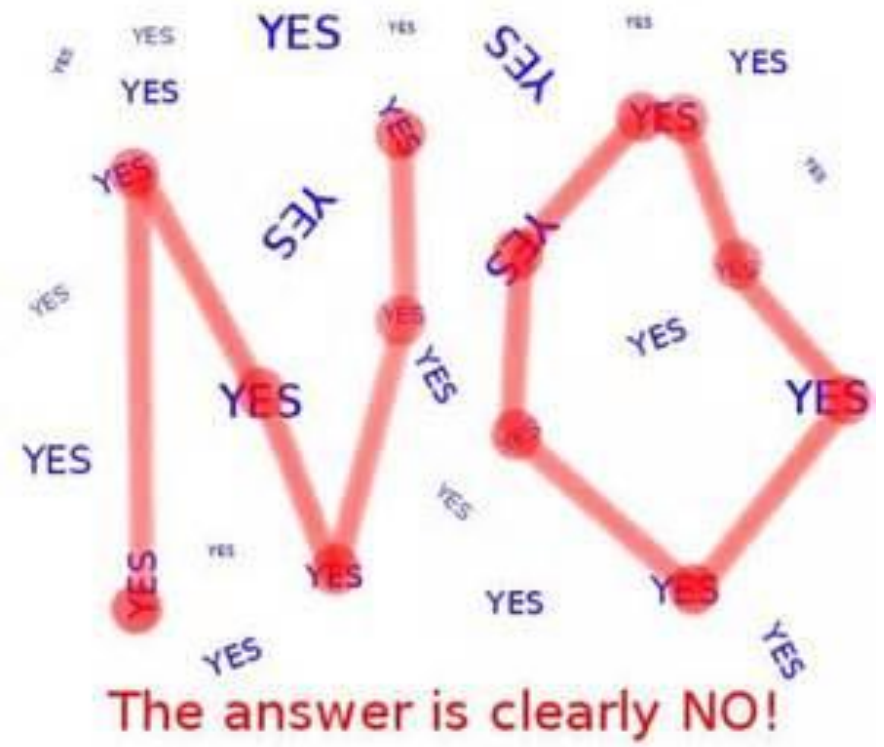
- Describes the common human tendency to rely too heavily on the first piece of information offered (the "anchor") when making decisions.
- Persuaded by features early in assessment, early attachment of a diagnosis and failure to adjust to new information

Anchoring Bias

- You go to a grocery store and see a sign that says the price has been rolled back.
- You assume that since it says it's a deal it must be.
- Patient's may have a "diagnosis" anchored to them and it is hard to change it.

Confirmation Bias

- The tendency to look for confirming evidence to support a diagnosis rather than look for reasons not to support diagnosis.
- Over-value data that supports pre-existing belief/diagnosis



Sunk Costs

- The more invested a clinician is in a particular diagnosis (time, thought etc), the less likely they are to release it and consider alternatives

CDRs Related to:

- Failure to Consider Other Diagnoses
  - Search satisficing
  - Unpacking principle
  - Vertical line failure

Search Satisficing

- Reflects the universal tendency to call off a search once something is found – even if the search was not completed. (Premature Diagnosis Attainment)
- Other things can be missed:
  - Comorbidities
  - Other fractures
  - Coingestants in poisonings

Unpacking Principle

- Failure to elicit all relevant information in establishing a differential diagnosis
- May result in significant possibilities being missed

Vertical Line Failure

- Following routine tasks or algorithms mindlessly
- Opposite of “thinking outside the box”
- Can cause clinicians to:
  - Work in silos
  - Miss unusual diagnoses
  - Get ‘stuck’ in an algorithm and be reluctant to move to another, more appropriate treatment path

CDRs Related to:

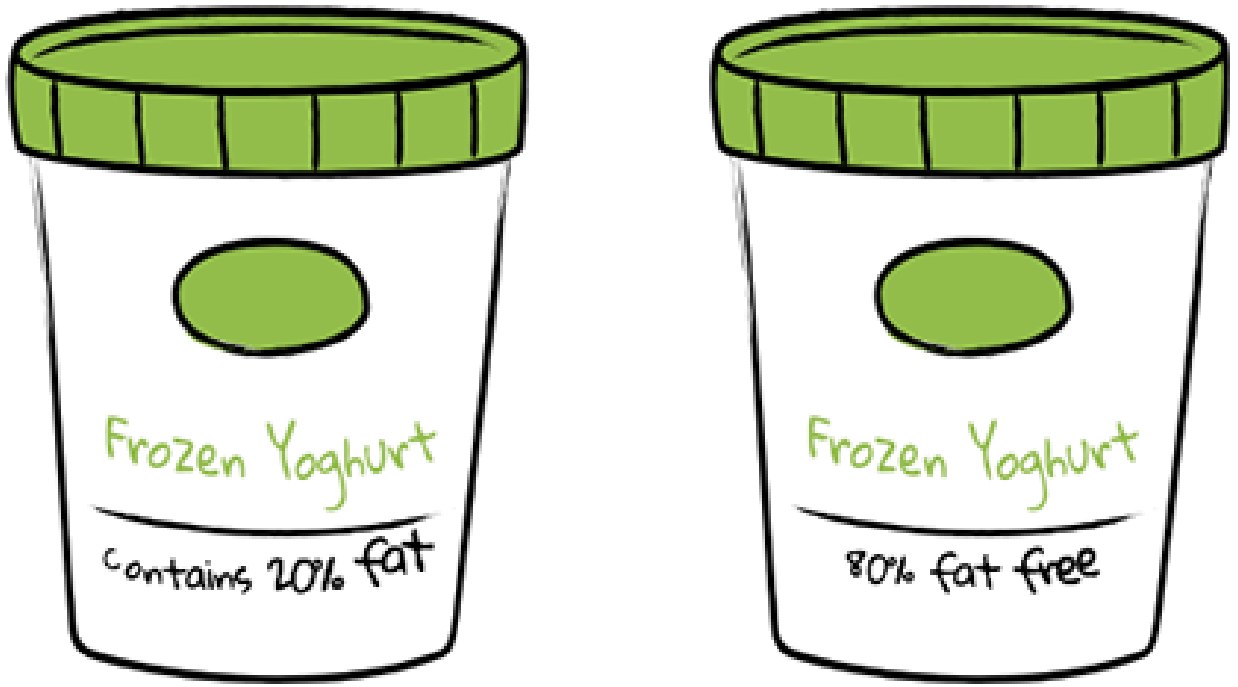
- Inheriting Someone Else's Thinking
  - Diagnosis momentum
  - Framing effect

Diagnosis Momentum

- Once diagnostic labels are attached to a patient they become stickier and stickier.
- Tough to shake a diagnosis once one has been declared.

Framing Effect

- How you see things may be strongly influenced by the way in which the problem is framed.



CDRs Related to:

- Errors in estimating prevalence of disease
  - Availability bias
  - Outcome bias
  - Playing the odds
  - Posterior probability error

Availability Bias

- Recent experience with a disease may inflate the likelihood of it being diagnosed.
- Conversely, if a disease has not been seen for a long time it may be under diagnosed

Outcome Bias

- Opting for diagnosis that lead to good outcomes rather than those that associated with bad outcomes.
- Clinician believes the likelihood of what is going to happen is what they hope for, but not what they really believe is going happen.

Playing the Odds

- The tendency to opt for a benign diagnosis, on the basis that it is more likely than a serious one.

Posterior Probability Error

- Occurs when you over value past experiences of patient as a basis for making decisions on current problems.
  - “Frequent flyers”

CDRs Related to:

- Patient characteristics or presentation
  - Ascertainment bias
  - Fundamental attribution error

Ascertainment Bias

- Expecting a member of a group to have certain characteristics without having actual information about that individual.
  - Stereotyping and gender bias

Fundamental Attribution Error

- The tendency to be judgmental and blame patients for their illness rather than examine the facts.

CDRs Related to:

- Clinician Decision Style (related to personality and affect)
  - Commission bias
  - Omission bias
  - Overconfidence bias

Commission Bias

- Results from the sense of obligation to intervene by the practitioner. (The patient will be harmed unless I do something.)

Omission Bias

- The tendency towards inaction to avoid perceived harm to the patient.
  - If an omission led to a harmful outcome it is perceived as less immoral than performing an act that leads to the same outcome.

Overconfidence Bias

- It is a universal tendency to believe we know more than we do.
- Tendency to act on incomplete information, hunches, or intuition. Too much faith in opinion
- Likely one of the most powerful biases

Clinical Errors

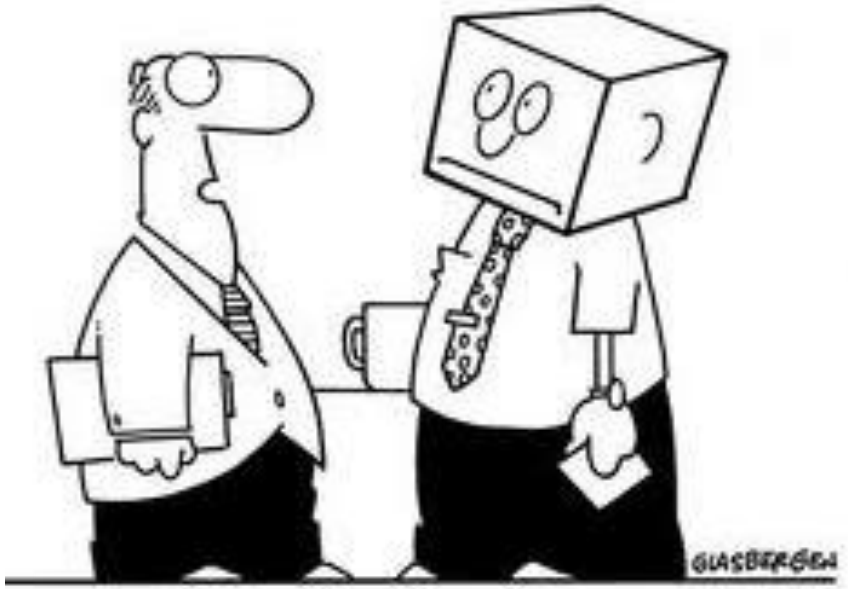
AVOIDING CLINICAL ERRORS

Minimizing Cognitive Biases

- There are several strategies that can be used to reduce the impact of ADRs/CDRs (biases) on decision making
  - Reduce the risk of cognitive errors
- The first step is having an awareness of clinical decision making and meta-cognition
  - Think about your thinking!

During a Call: "What Else Could This Be?"

- Always consider alternatives before acting.
- Pause to consider differential diagnoses before decision or action.
  - Ask your partner
- Think about your thinking
  - Be aware of the effect of rushing on your decisions



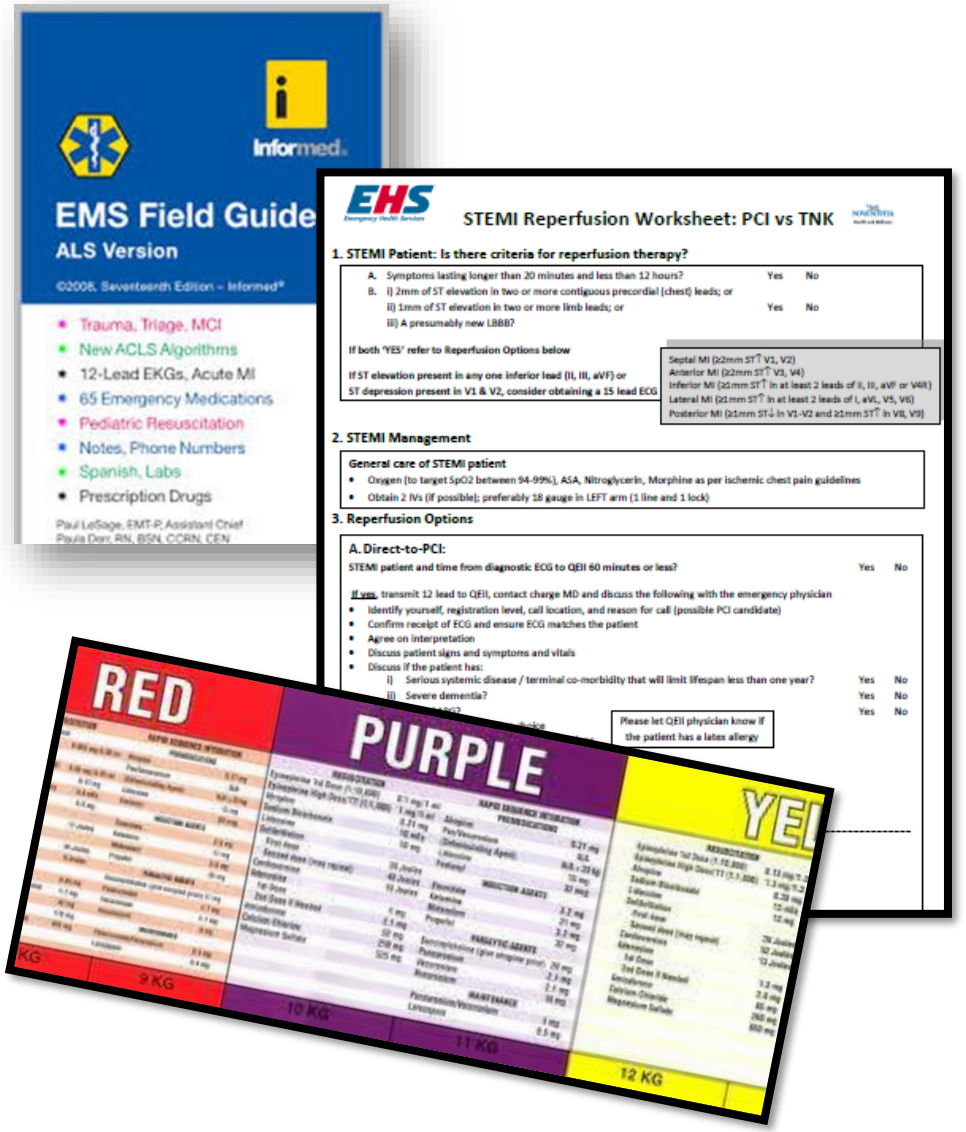
"Thinking outside of the box is difficult for some people. Keep trying."

During a Call: Have a Plan

- Develop generic and specific strategies to avoid bias in particular clinical situations.
- Be sure to start fresh
  - While it's important to listen and understand the information provided to you by clinicians who took care of the patient before you, be sure to conduct a new full assessment, to uncover anything that has been missed.

During a Call: Use of Memory Aids

- Decrease the need to rely on memory
- Use field guides (e.g. the Broselow tape), checklists, mobile devices, etc. to assist during a call



During a Call: Communicate

- Verbally discuss the call with your partner, to ensure all possibilities are considered and you agree on the plan.
- Do not hesitate to consult medical oversight for advice.

After a Call: Reflect

- Think about the call as soon as possible after it is complete.
- Objectively think back on the decisions made.

After a Call: Outcome

- Seek out information on the outcome of your patient

After a Call: Share With Others

- Report adverse events and near misses
- Share your experiences during M&Ms and education sessions.
- Be sure to discuss the decision making process and effect of ADRs & CDRs

In Training: Decision Making Awareness & Think Aloud

- During simulation sessions, pause after every decision or action to discuss why a decision was made.
  - Use the 'think aloud' approach:
    - What information did you use to make the decision? What additional information do you require?
    - Was System 1 or 2 used? What decision strategy?
    - Did participant affect or other factors impact decision making?
  - Use memory aids during simulation