MEDAVIE HealthEd
College of Paramedicine

ÉduSanté
Collège de formation paramédicale

Clinical Decision Making

Advanced Care Paramedicine

Module: 02

Section: 01d

Lecture Outline

- Introduction
- Paramedic practice
- Thinking under pressure
- The critical decision process
- Critical Errors

Introduction

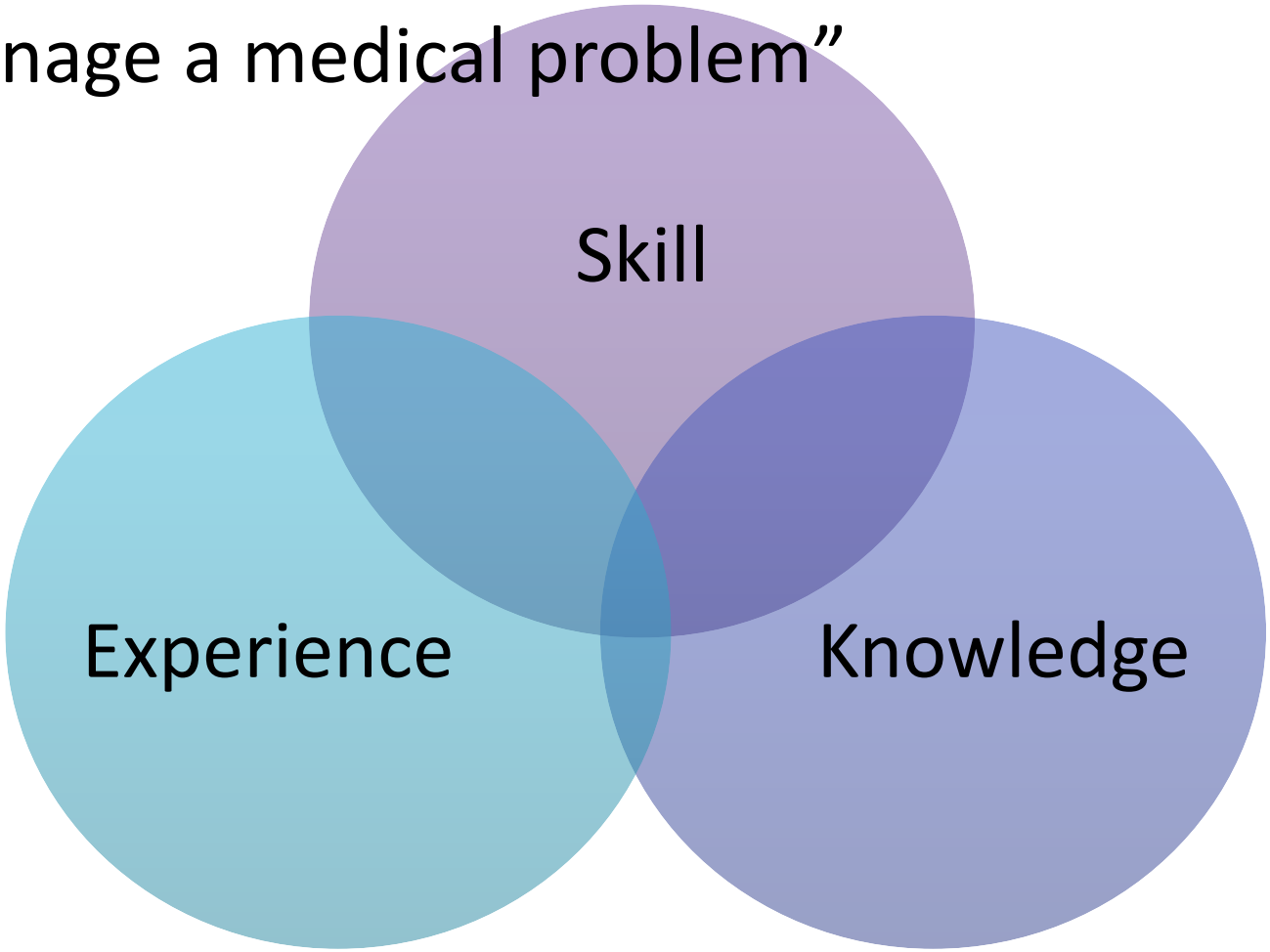
- 21st Century Paramedics are prehospital practitioners of emergency medicine and not field technicians.
- As a paramedic, you inevitably will face your moment of truth—a critical decision that can mean the difference between life and death.

Critical Thinking

- Process by which the information gleaned from the history and physical examination
  - Not “intuitive”
  - Merges with clinical knowledge, experience, and the current best evidence to formulate the next steps in patient care
    - Development of the diagnostic and management plans
- Critical reflection involves thinking through the reasoning for these decisions

Clinical Reasoning

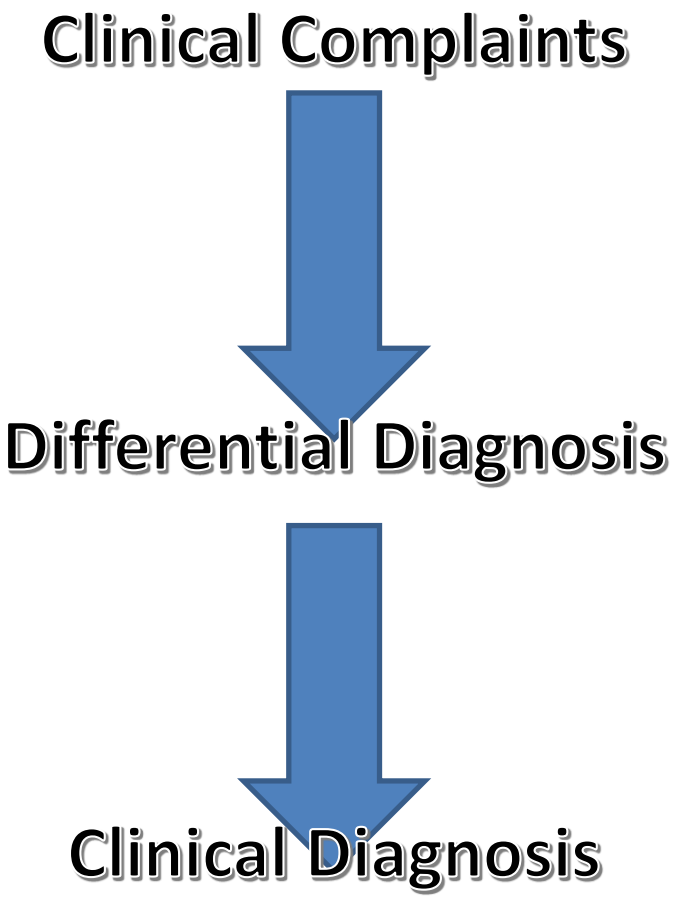
- "the cognitive process necessary to evaluate and manage a medical problem"



The Clinical Examination

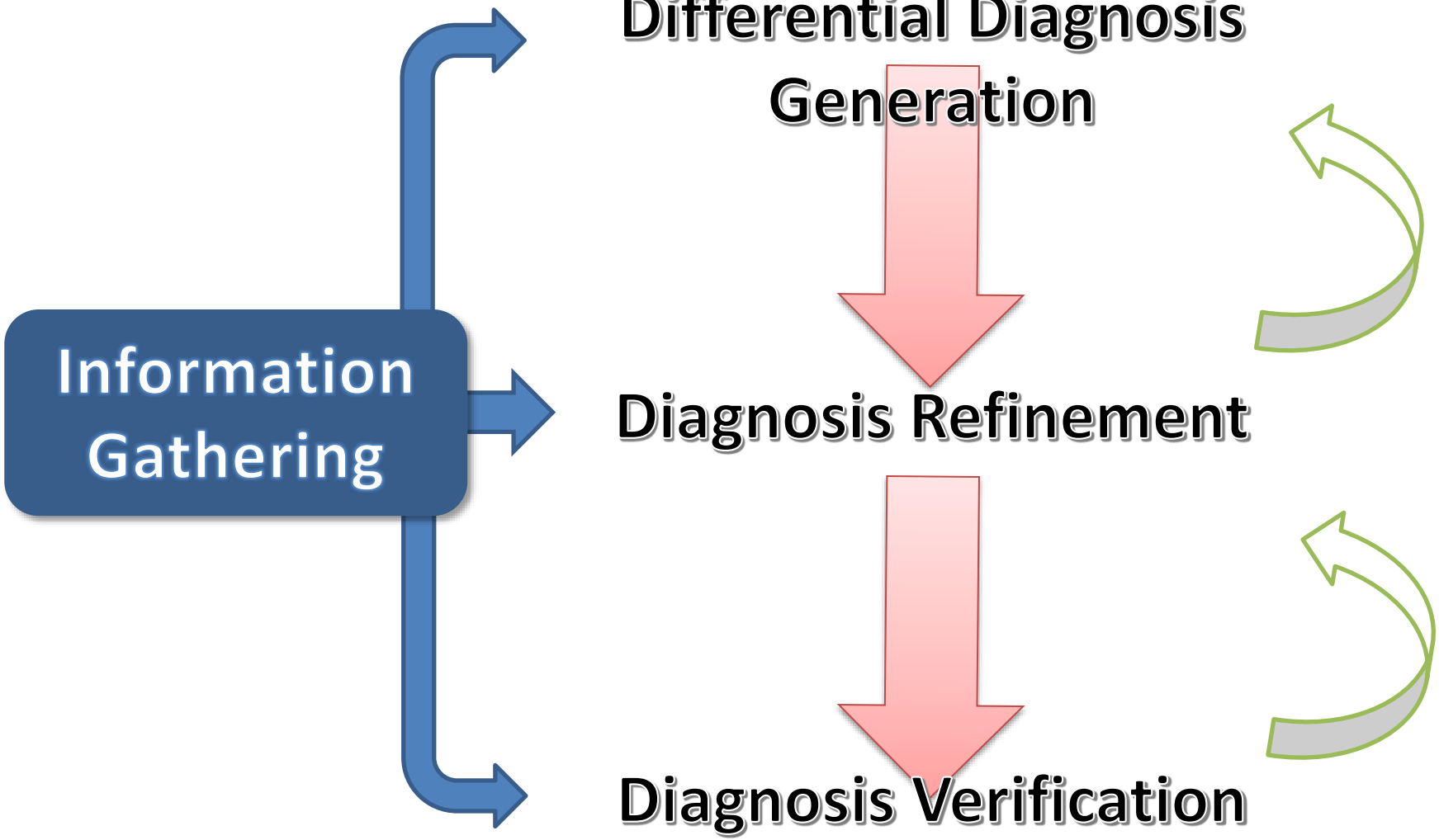
- Thus far, we have been concerned with the initial interaction with the patient:
  - Establishment of respectful rapport
  - Information-gathering processes
    - History and physical examination
- Next steps:
  - Organizing
  - Integrating
  - Analyzing information

Paramedic Practice



- Paramedic must gather, evaluate, and synthesize much information in very little time.
- Develop a field diagnosis
  - Prehospital evaluation of the patient's condition and its causes
- Develop and implement a treatment plan

Diagnostic Process



Acuity

- The severity or acuteness of your patient's condition falls into three classes:
  - Critically life threatening
  - Potentially life threatening
  - Not life threatening
- Protocols, standing orders and patient care algorithms provide guidance for caring for these different presentations

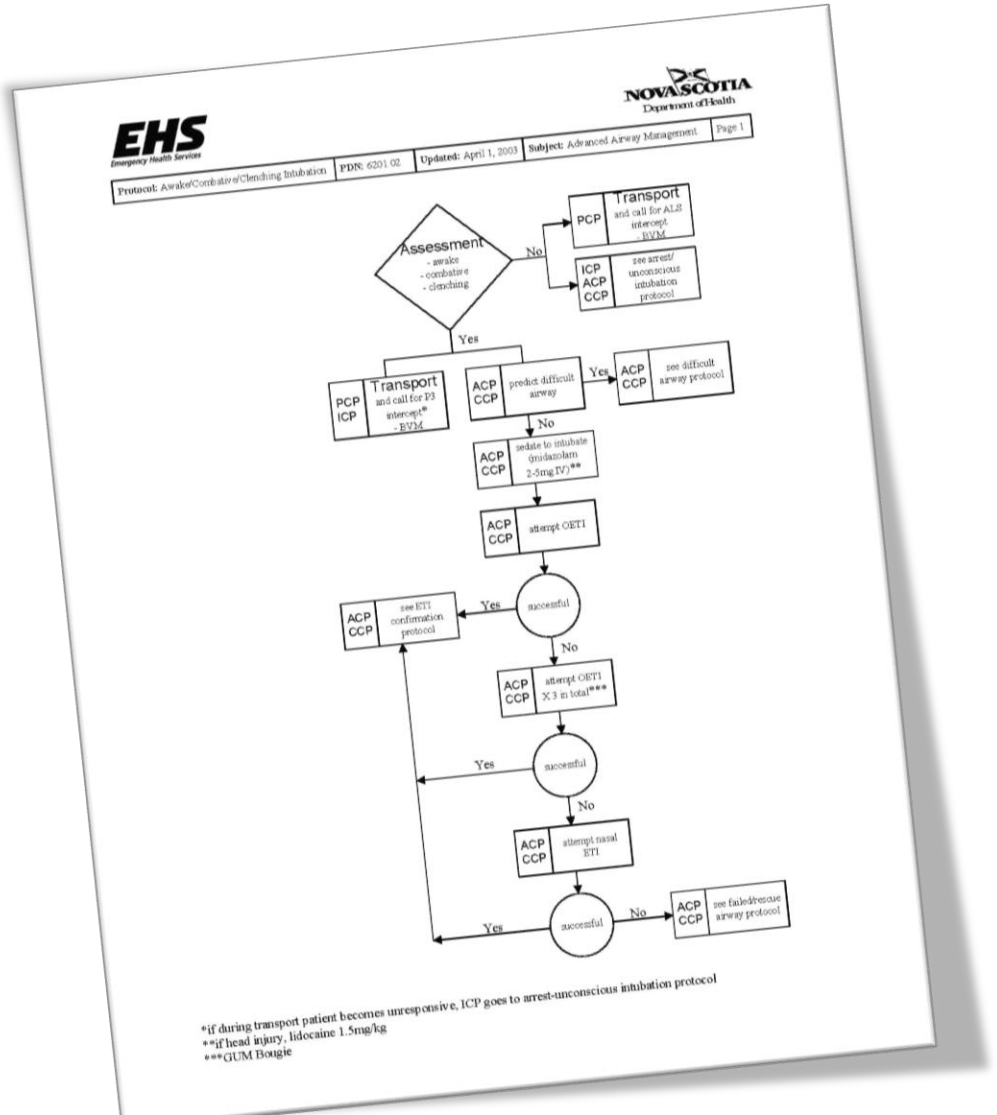
Definitions

- Protocol
  - A standard that includes general and specific principles for managing certain patient conditions.
- Clinical Practice Guidelines
  - Statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options.
- Standing Order
  - Treatments you can perform before contacting the medical control physician for permission
- Algorhythm
  - Schematic flow chart that outlines appropriate care for specific signs and symptoms.

Protocols, standing orders, and patient care algorithms provide a standardized approach to emergency patient care.

How Do You Make Decisions?

- Protocol Driven
  - Standing Orders
  - Algorhythmic



How Do You Make Decisions?

- Protocol Driven
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- Pattern Recognition

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- Worst Case Scenario

How Do You Make Decisions?

- Protocol Driven
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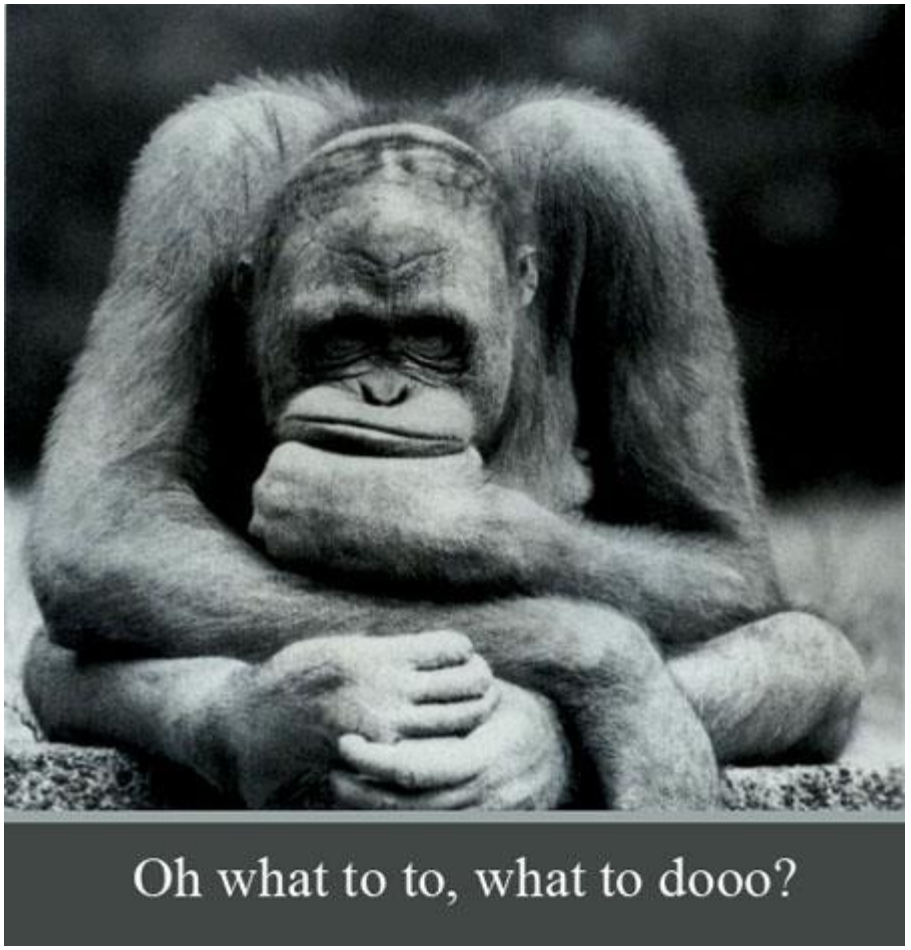
- Pattern Recognition
- Worst Case Scenario
- Event Driven



- Worst case scenario

- Pattern Recognition

RATIONAL Decision Making

- Protocol Driven

- Event Driven

Fundamental Knowledge and Abilities

- Anatomy, physiology and pathophysiology
- Focusing on large amounts or data
- Organizing information
- Identifying and dealing with medical ambiguity
- Differentiating between relevant and irrelevant data
- Analyzing and comparing similar situations
- Explaining decisions and constructing logical arguments

Clinical Decision Making

STEPS IN CRITICAL THINKING

Assessment, Judgment, and Evidence

- Bringing the decision making, clinical experience, and knowledge of the patient together with the current best evidence regarding the issues involved
  - Assess information
  - Assign priorities
  - Form clinical opinion
  - Integrate patient and professional preferences
  - Further assess

Differential Diagnosis

- Initial patient presentation and complaints will allow you to form a differential diagnosis
  - The list of probable causes of your patient's symptoms
- Further history and assessment will allow you to narrow your diagnosis to a most probable cause
- Allows for a "Rule in/Rule out" approach

Diagnosis Identification

- A diagnosis (chief complaint) may be defined as anything that will need further evaluation and/or attention and what the patient is telling you.
- It may be related to one or more of the following:
  - An uncertain diagnosis
  - New symptoms or physical examination findings related to a previous diagnosis
  - New symptoms or findings of unknown etiology
  - Unusual findings revealed in the clinical examination
  - Personal or social difficulties

Diagnosis Identification (Cont.)

- Formulate problems as specifically as possible
- The diagnosis list is key to developing a complete understanding of a patient's concern
- This includes using your differentials to help rule in and rule out condition

Diagnosis Identification (Cont.)

- Review the list and note any thing missing that you might expect in support of your hypotheses
  - Beware of “red herrings,” the bits of information that are distracting and draw your thinking away from central issues
- Critically evaluate unexpected or unusual findings, but do not let them distort full consideration of all you have learned

Diagnosis Identification (Cont.)

- After a matching data (both subjective and objective) with possible diagnosis
  - Consider the appropriate assessments and diagnostics to confirm the diagnosis and/or rule out other possibilities
  - Specialty consultation may be needed before establishing the diagnosis (OLMC, etc)

Valid Hypotheses

- Critical thinking allows you to consider and discard a variety of possible diagnoses—from the common to the rare
- It has been said (Kopp, 1997) that there are at least three diagnoses for every disease
  - The one that unifies what you have learned
  - The one you cannot afford to miss
  - The one that it actually is
  - Sometimes they are the same one, *but usually not*

Valid Hypotheses (Cont.)

- Occam's razor or *lex parsimoniae* ("law of parsimony" or "law of succinctness")
  - All findings should be unified into one diagnosis
  - *This is not always true*
  - More than one disease process can exist at one time in the same person

Facilitating Behaviours

- Stay calm, do not panic
- Assume and plan for the worst; err on the side of the patient
- Maintain a systematic assessment pattern
- Balance analysis, data processing and decision making styles
- Remain adaptable
- Except for safety concerns, never allow anything to distract you from your most important job—assessing and caring for your patient.

Useful Thinking Styles

- Situation analysis
  - Reflective versus impulsive
- Data processing
  - Divergent versus convergent
- Decision making
  - Anticipatory versus reactive

Thinking Under Pressure

- With experience, you will learn to manage nervousness and maintain a steadfast, controlled demeanor.
- Develop a routine mental checklist to stay focused and systematic.
- 2 Common methods are the Mental Checklist and The Critical Decision Process

Thinking Under Pressure

- Hormonal influences from "fight or flight" response
  - Positive effects
    - Enhanced visual and auditory acuity
    - Improved reflexes and muscle strength
  - Negative effects
    - Impaired critical thinking skills
    - Diminished concentration and assessment ability

Mental Conditioning

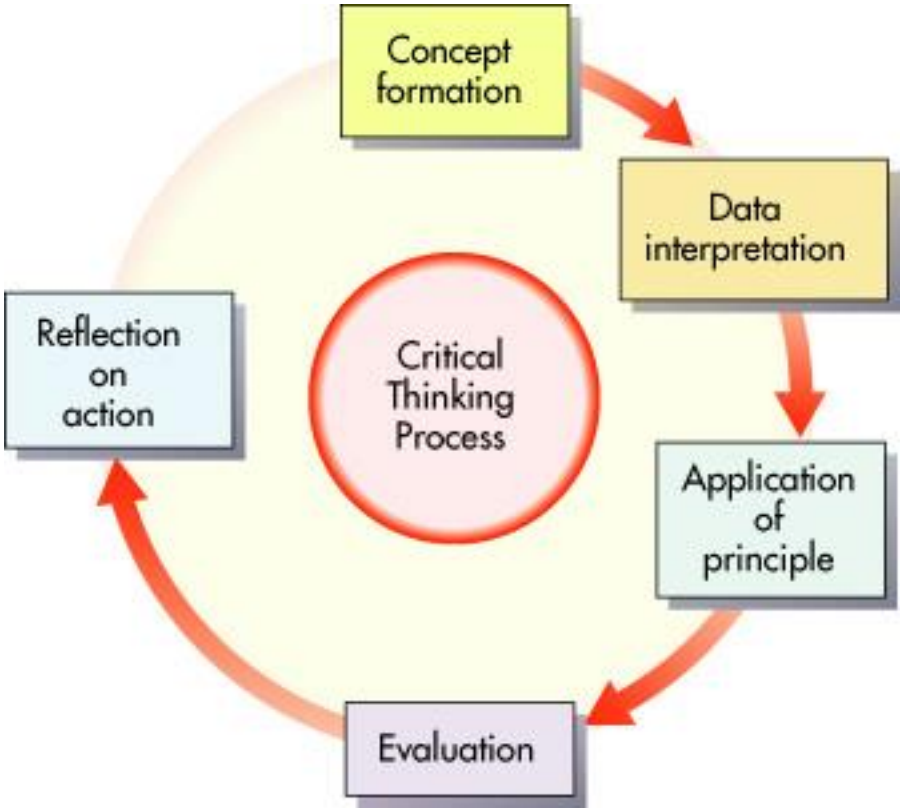
- Key to effective performance under pressure
  - Skills learned at a pseudo-instinctive performance level
  - Automatic response for technical treatment requirements

Mental Checklist

- Scan the situation
- Stop and think
- Decide and act
- Maintain control
- Re-evaluate

The Critical Decision Process

- Form a concept
- Interpret the data
- Apply the principles
- Evaluate
- Reflect



Putting It All Together

- The Six R's
  - Read the scene
  - Read the patient
  - React
  - Re-evaluate
  - Revise the management plan
  - Review your performance

Clinical Decision Making

POSSIBLE BARRIERS TO CRITICAL THINKING

Feelings, Attitudes and Values

- Critical thinking becomes complex because of emotions in both patient and provider
- Feelings, attitudes, and values may be strong enough that our decision making may be impaired
- Recognize that your personal biases may affect your decision and assessment process.

The Ethical Context

- Personal and societal ethics does not provide answers to the situations you will encounter within EMS. But will guide your decisions
- Consideration of ethical principles provides the framework for respectful, flexible discussion and a disciplined approach to clinical decision making

The Ethical Context (Cont.)

- Some ethical considerations or guidelines include:
  - Autonomy
    - Patient's self-determination
  - Beneficence
    - Do good for the patient
  - Nonmaleficence
    - Do no harm to the patient

The Ethical Context (Cont.)

- Utilitarianism
  - Appropriate use of resources for the greater good
- Fairness and justice
  - Equitable treatment of all
- Deontologic imperatives
  - Care delivered according to traditions and in cultural contexts. This is supported by protocols and patient care guidelines

The Ethical Context (Cont.)

- Ethical principles can come into conflict in any given circumstance
- If it is difficult to make a decision, consider the following:
  - Is the problem one of ethics or poor communication
  - Are you and the patient communication clearly or are there barriers between the patient and provider?
  - Is there a reasonable chance for a satisfactory health or medical care outcome?

Clinical Decision Making

EVALUATION AND MANAGEMENT PLAN PUTTING IT ALL TOGETHER

Evaluation and Management

- This is the point where you decide what you think is going on (the diagnosis) and what you are going to do about it (your management plan)
- Your working diagnosis is based on your assessment findings, history with differentials ruled-in or out and matched with appropriate medical care

Evaluation and Management

- Developing a sequence for your critical thinking and clinical decision making process, based on your assessment process, will help you accurately assess your patient and decide upon a working diagnosis.

Evaluation and Management

- Remember that clinical decision making and the critical thinking process takes place throughout the whole call an helps you become a better practitioner.

Clinical Decision Making

CLINICAL ERRORS

Clinical Errors

- Human error (not technical error) is the greatest threat to complex and potentially hazardous systems such as healthcare.
- The aviation field notes that over 70% of adverse events are due to human factors
  - Healthcare data suggests a similar rate
- Human fallibility can be moderated, but it cannot be eliminated.

Decision Making

System 1	System 2
Fast	Slow
Unconscious Effortless Automatic	Deliberate and conscious Effortful Controlled mental process
Without self-awareness or control	With self-awareness or control
Impressions Intuitions Feelings	Logic Analysis Reflection
Can perform while tired, sick or stressed	Impaired by fatigue, illness or stress
Performs familiar or practiced routines	Necessary for novel decisions or routines
Error prone	Reliable, can override errors through careful thought

Clinical Errors

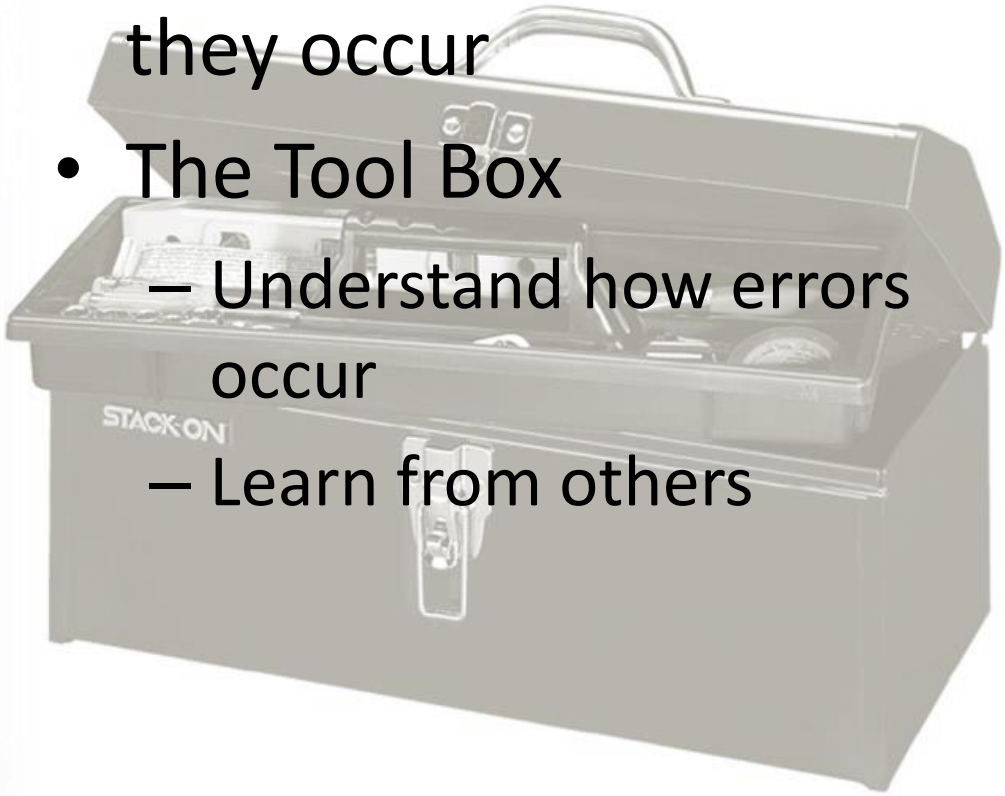
- Not all errors are the same, and each may have different underlying mechanisms, occur in different parts of the organisation or require different methods of risk management to avoid them
- Error types
  - Execution failures
  - Planning or problem solving failures

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 2 reasoning based on an incomplete or inaccurate information that is subject to cognitive biases

How to Avoid Clinical Errors

- Must understand how they occur
- The Tool Box
  - Understand how errors occur
  - Learn from others



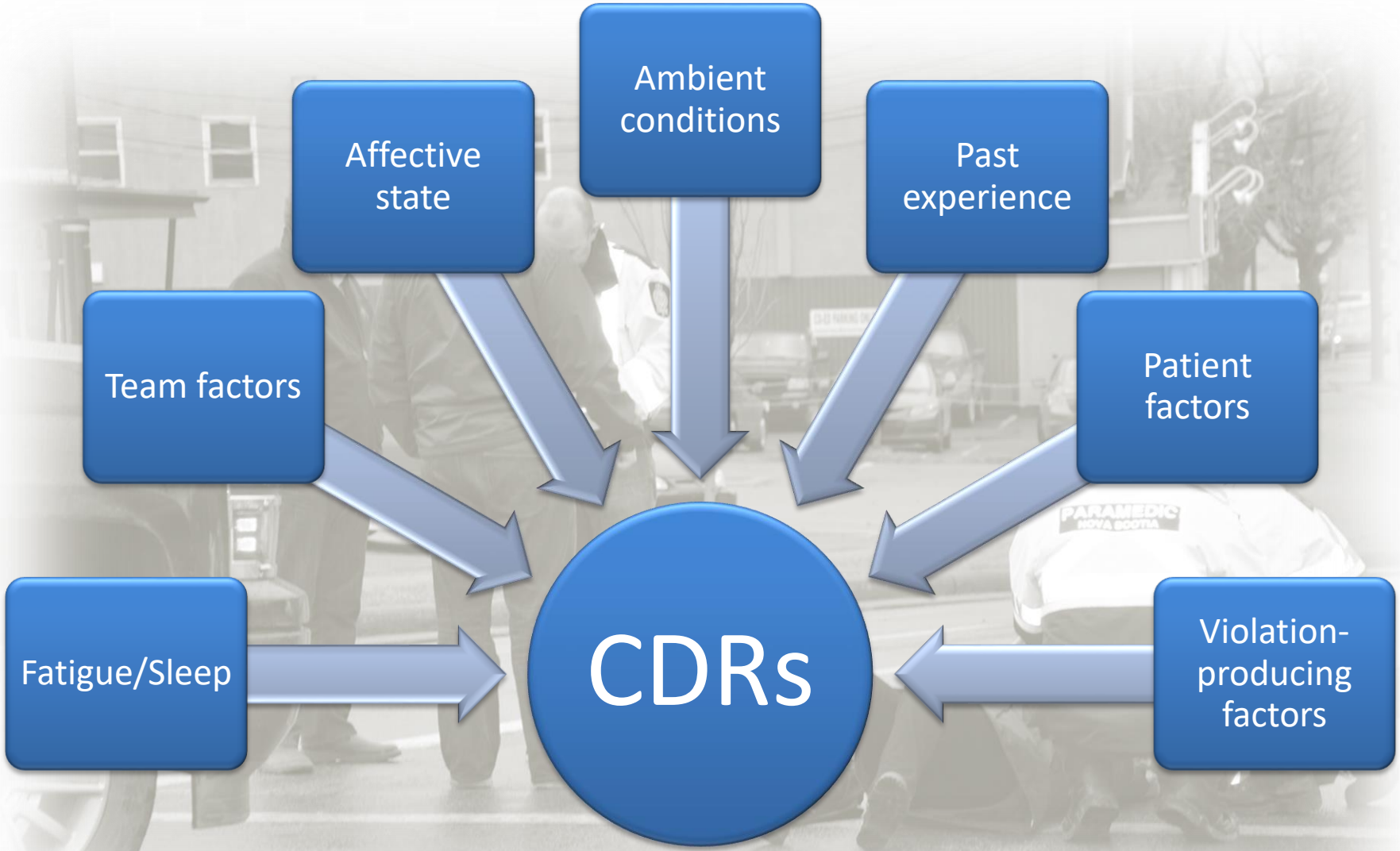
Challenges

- Fast-paced environment
- Urgent/Emergent decision making
- High risk decision making
- High uncertainty
- Incomplete data
- Narrow windows
- Multiple decisions
- Varying levels of training

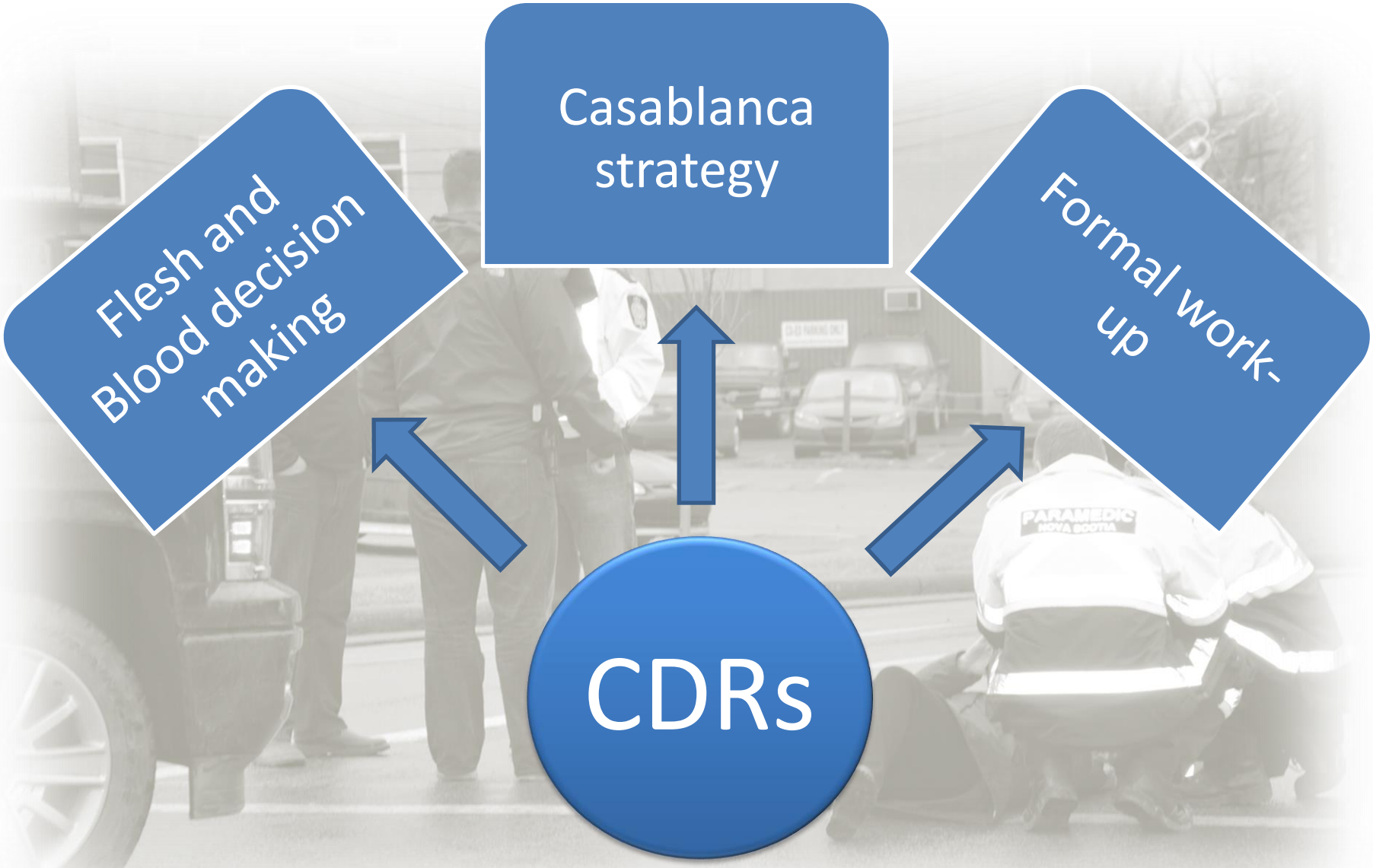
Cognitive Dispositions to Respond (CDR's)

- 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)



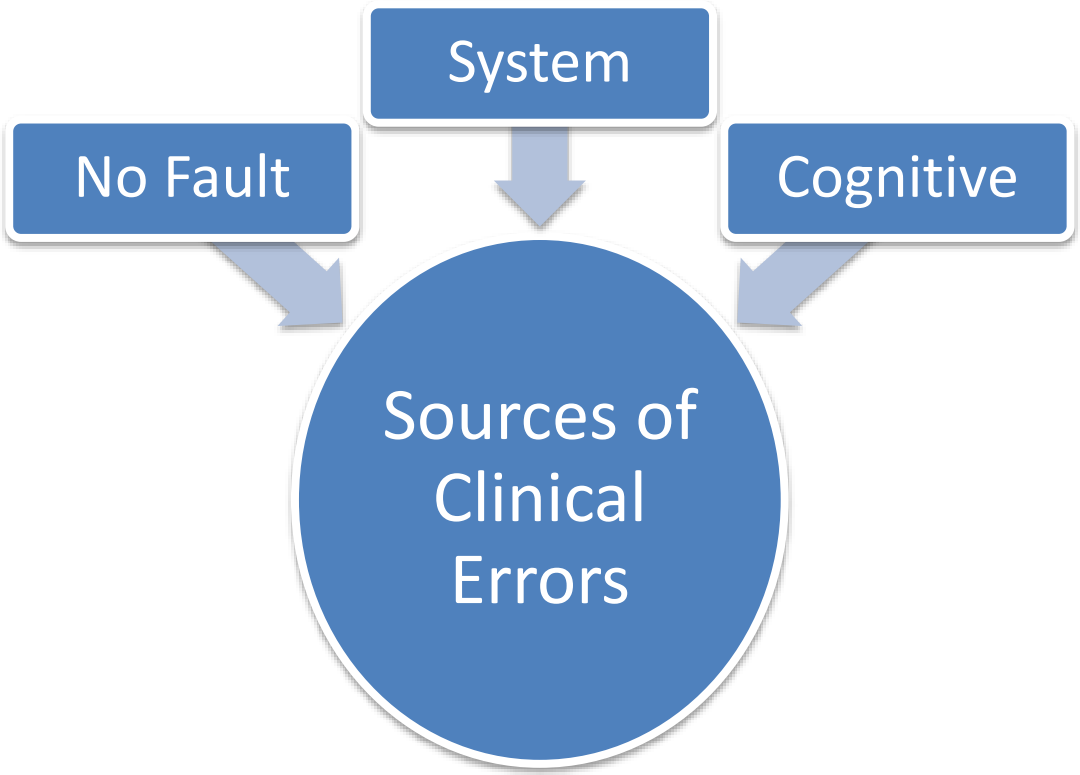
Cognitive Pathway Response



Clinical Errors

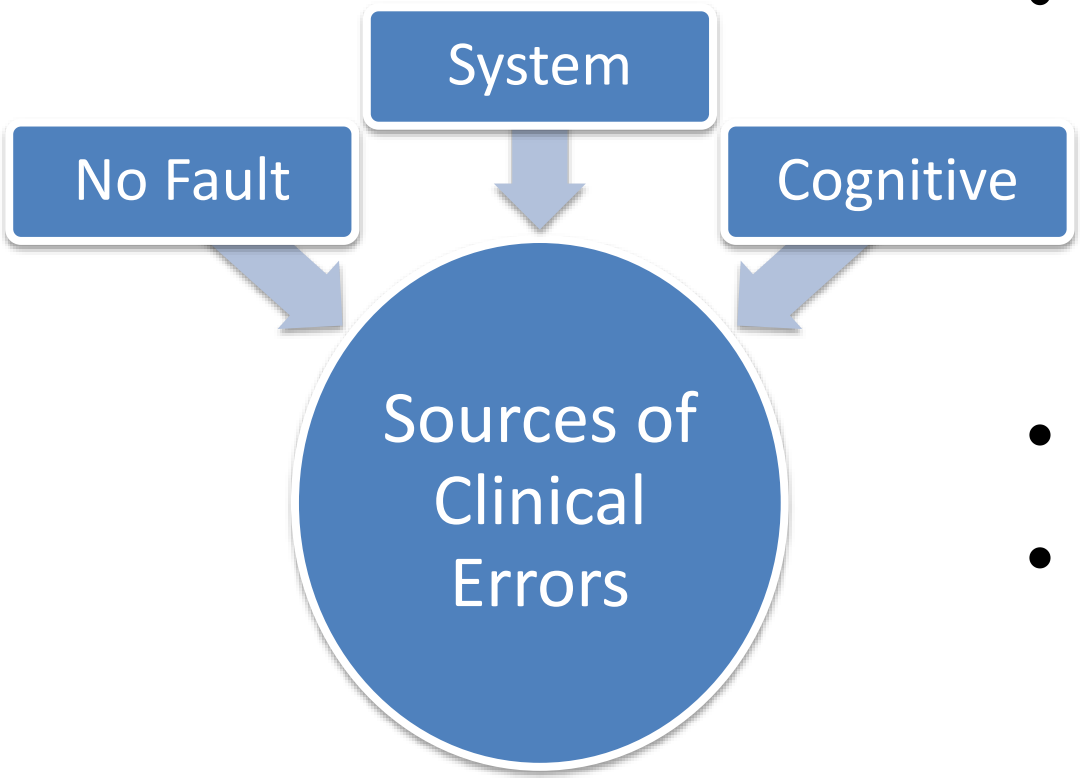
- How do clinical errors occur?

No Fault



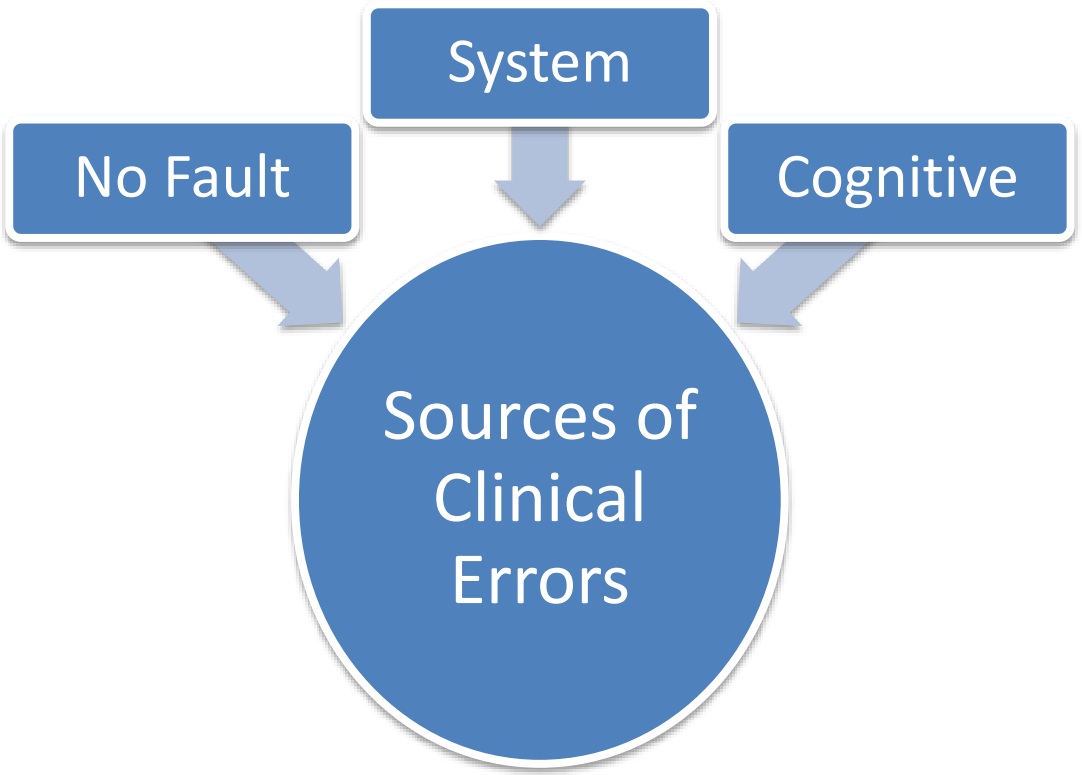
- Considered unavoidable
  - Unreliable information from the pt
  - Somatoform disorders
    - Physical complaint with no physiological cause (psych)
  - New/Rare Disorder
  - Pt refuses diagnostic assessment
  - Silent presentation of co-morbid illness (silent MI)

System



- Error producing conditions
  - Language Barriers
  - Chaotic scenes
- Time delays
- Equipment failures

Cognitive



- Knowledge deficiencies
- Incomplete Data Gathering
- Medication errors
- Dosage
- Administration error
- Test misinterpretation
- Cognitive Biases

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Clinical Errors

COGNITIVE BIASES

Anchoring Bias

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

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.

Ascertainment Bias

- Stereotyping and gender bias
- Expecting a member of a group to have certain characteristics without having actual information about that individual.
- All elderly people are deaf
- Children don’t understand
- All drug addicts are seeking more medications

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
- The 2014 Ebola outbreak in West Africa was a real concern for those African nations with little resources to identify and quarantine the problem in a timely and effective manner. It was constantly in the news.
- As a result, when patients presented to their doctor at that time with a fever, the consideration of Ebola as a cause of the fever was perceived by some as being more likely than other illnesses (such as influenza) which were orders of magnitude more likely than Ebola.

Commission Bias

- Results from the sense of obligation to intervene by the practitioner. The patient will be harmed unless I do something.
- You are transporting a palliative care patient from home to the hospital and is presenting with agonal respirations, weak pulse and ALOC. Enroute they go into cardiac arrest. Do you treat?

Confirmation Bias

- The tendency to look for confirming evidence to support a diagnosis rather than look for reasons not to support diagnosis.
- Closely connected to Anchoring Bias

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.
- During a hand over of a patient the information provided by the clinician is given in context to support their differential diagnosis and/or treatment while leaving out other aspects that may not support it.

Fundamental Attribution Error

- The tendency to be judgmental and blame patients for their illness rather than examine the facts.
  - Marie, a 20 y/o paramedic student, continuously puts her head down on the desk during lectures. Her instructor has noticed this and considers her lazy and unmotivated. She plans to reflect this "lack of motivation" in Marie's class grade.
  - Marie is the only one who puts her head down in class, and she does this consistently. Other students are focused on the instructor. She must not be motivated; it sounds logical.
  - The situation explaining it indicates Marie's behavior is the opposite, however. She is trying to pursue her education while trying to raise her child and working part time to support her education.

Gambler's Fallacy

- Making risky diagnosis based on recent trends or likelihoods.
  - A person thinks the probability of an outcome has changed, when in reality, it has stayed the same.
  - If a coin is flipped 10 times and lands on "heads" every time, a person employing gambler's fallacy would believe the probability of the coin landing on "heads" the 11th time would be very low.
  - The truth, however, is that the probability of a coin being "heads" or "tails" is 50% every time the coin is flipped.
  - The probability remains the same.

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.
  - Parents of a 1 y/o child trying to decide if they should vaccinate their child for influenza. The probability is that 10 in 10,000 will die from the flu but the vaccine has some side effects that could be fatal.

Outcome Bias

- Opting for diagnosis that lead to good outcomes rather than those that associated with bad outcomes.
- In other words if the outcome is bad then the decisions that led up to it must be bad or a good outcome came from good decisions.

Overconfidence Bias

- It is a universal tendency to believe we know more than we do.
  - Individuals with little experience in scientific research become convinced of a proposition (such as the dangers of vaccines and genetically modified organisms) because they "did their research" by typing these terms into an internet search engine or read about them on social media.

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"

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)

Sunk Costs

- The more clinicians invest in a particular diagnosis, the less likely they may be to release it and consider alternatives.

Unpacking Principle

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

Minimizing Cognitive Biases

- Understand where errors occur and minimize their opportunities
- Consider alternatives (What else could it be – don’t get tunnel vision)
- Utilize memory aids (mnemonics, algorithms, apps)
- Practice and train
- Stay current, review CPG’s
- Read articles, texts….

What if I make an Error?