ADVANCED ASSESSMENT

Critical Thinking Skills

2007 Ontario Base Hospital Group
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Objectives

- Why is critical thinking important
- Define the components of critical thinking
- Compare pre-hospital to in-hospital
- Differentiate between:
  - critical life-threatening
  - potentially life-threatening
  - non life-threatening
Objectives

Evaluate the benefits and limitations of
- Protocols
- Standing orders
- Patient care algorithms
Introduction

- Paramedic profession has changed
- 21st century healthcare has changed.
  - technology of the day has changed our status.
  - we are professionals, not technicians.
    - to fulfill this role you must develop new ways of handling situations.
    - develop critical thinking skills.
Why Is Critical Thinking Important?

- every patient is unique.
- **very few, if any, patients have read the textbook.**
- patients seldom look like the book says they are supposed to...e.g. have “pressure-like” chest discomfort when having a heart attack.
- don’t rely on so-called “classic” presentations
- employ a systematic, yet focused approach to every patient and don’t rely on “pattern” recognition
Goal For Every Paramedic

- develop Differential Diagnosis.
  - narrow it to a Field Diagnosis.
  - develop and Implement a treatment strategy.
  - reassess & re-evaluate
  - do it well!!
Components of Critical Thinking

- Sound knowledge
- Formulating a differential diagnosis
  - Looking at signs & symptoms in terms of their sensitivity & specificity
- Determine a treatment plan while weighing the risk/benefit ratio for all interventions
- Re-evaluating
Sound Knowledge

- A thorough knowledge of body systems and medical conditions is essential for processing information obtained through patient assessment and history gathering.
- Without a sound knowledge, you would not know what information is relevant and what information is missing to help you make decisions about treatment.
Scenario # 1

Your patient is a 58 year old male. His chief complaint is shortness of breath. He tells you his chest is a little uncomfortable. The patient appears to be in moderate to severe distress with 1-2 word dyspnea. Auscultation reveals coarse crackles in both lower lobes.

At this point, what is the differential diagnosis?
Differential Diagnosis

- AMI
- acute pulmonary edema 2° to CHF
- cardiogenic shock
- pulmonary toxin
- pneumonia
- COPD exacerbation
- anaphylaxis
- ?
The Patient Is Getting Worse!!

- as you are taking a history, the patient is becoming less responsive.
- you quickly assess the pulse and find it weak and difficult to count.
- the wife tells you he has a history of heart trouble and that he described the chest pain as “heavy” in nature.
- his medications include an ACE inhibitor, a nitrate, a diuretic and an antigout drug
- now what do you think the problem may be?
Differential Diagnosis

- AMI
- acute pulmonary edema 2° to CHF
- cardiogenic shock
Sensitivity & Specificity

“Sensitivity is the likelihood of a positive test result in patients with disease; it measures how well the test detects the disease. It is the complement of the false-negative rate (eg., the false-negative rate plus the sensitivity = 100%).

Specificity is the likelihood of a negative test result in patients without disease; it measures how well the test excludes disease. It is the complement of the false-positive rate.”

Merck Manual.
Sensitivity & Specificity

Remember the scenario: 58 year old male with SOB and he tells you his chest is a little uncomfortable. 1-2 word dyspnea and coarse crackles in both lower lobes.

**Sensitivity:** the frequency with which a sign or symptom occurs in a given illness – e.g. shortness of breath occurs frequent in the setting of AMI (high sensitivity)

**Specificity:** describes the uniqueness of a sign or symptom for a given medical condition – e.g. “heavy chest discomfort” occurs in few conditions other than AMI, therefore it is a symptom that has a high specificity for AMI
Why Did You Have to Take Vital Signs?

as you prepare equipment, your partner has been taking vital signs. He reports the following:

- BP is 60/40
- pulse is 60
- respirations are 32 and shallow
- what other diagnostic tools will you use?
- what other information do you wish to have?
What Else?

- How about allergic to morphine.
- Oh yeah, and aspirin.
- And this Paramedic with you is working his first day.
- You are 30 minutes or more from the closest hospital.
- Your radio quit working.

More of this fiasco later.
Field Diagnosis

- at this point you should be narrowing it down to a cardiac event.
- what is the management plan?
Management Plan

- Oxygen high flow
- MONA-maybe?
- Cardiac Monitor

HOUSTON WE HAVE A PROBLEM!!!!!
Patient Acuity

- Critical Life Threatening
  - major Multi-system Trauma
  - devastating Single System Trauma
  - end Stage Disease
  - acute medical condition
  - acute exacerbation of chronic condition
  - compounding co-morbidities
  - no time for critical thinking
    - skills are performed by instinct
    - drawing on your training
    - patient fits standard algorithms
Risk: Benefit Ratio

- Oxygen high flow: Risk, Benefit
- Cardiac Monitor: Risk, Benefit
- SpO₂ Monitor: Risk, Benefit
- ASA: Risk, Benefit
- IV access: Risk, Benefit
- NTG: Risk, Benefit
- Morphine: Risk, Benefit
- Fluid bolus: Risk, Benefit
- Transport: Risk, Benefit
Patient Acuity

Definition:
- Severity or acuteness of your patient’s condition.
- There are 3 classes:
  - Critical Life Threatening
  - Potentially Life Threatening
  - Non-Life-Threatening
Patient Acuity

Potential Life Threatening
- Serious Multi-system Trauma
- Multiple disease etiologies
  - Diabetic with cardiac complications
  - Cardiac history with COPD

Can become unstable at any moment
Can be our greatest challenge!
Patient Acuity

- Non-Life Threatening
  - Majority of EMS Calls
  - Minor illness or injury
  - Requires very little critical thinking
Protocols and Algorithms

- Protocols, standing orders and algorithms help promote a standardized approach to the “classic patient”.
- Clearly defines and outlines performance boundaries.
- However:
  - What about the patient that doesn’t fit the model?
  - The patient with multiple, serious problems?
  - Promotes “cookbook” medicine.
Critical Thinking Skills

- The ability to think under pressure and make clear, precise and accurate decisions weighing all the factors and risks & benefits of treatments.
- Your patient depends on your critical thinking ability.

These cannot be taught!
This ability is developed over time!!
SUMMARY

For an effective critical thinking process, several elements must be present:

- know anatomy, physiology and pathophysiology – Review it often!!!
- focus on large amounts of data simultaneously
- organize the data
- differentiate between relevant and irrelevant data
- analyze and compare similar situations
- be able to defend the decision
Paramedic Practice

3 things to do in a short time.
- gather information.
- evaluate the information.
- process the information.

turn that information into the field diagnosis.

develop and implement a management plan.
Narrow the Field

- First part of the history taking will give you the differential diagnosis.
- That is a broad group of problems and hard to use them to develop a plan.
- Must be able to narrow the problems to a field diagnosis.
- From the field diagnosis is the plan.
Facilitating Behaviours

- stay calm
- plan for the worst
- work systematically
- remain flexible
- reassess
- re-evaluate
- don’t be afraid to discuss situation with your partner and/or with medical control
Thought for the Day

to be an excellent paramedic, you must be like a duck:
  - cool and calm on the surface
  - paddle feverishly underneath
Useful Thinking Styles

- do not allow distractions, unless situation says-”get out” for personal safety
- reflective vs. impulsive
- divergent vs. convergent
- anticipatory vs. reactive
Mental Checklist

- Scan the situation
  - Colombo (or CSI) medicine
- Stop and think
  - every action causes a reaction
- Decide and act
  - “stand back - take in the big picture”
- Maintain control
  - “may I have the Zoll, LifePak 12 please”
- Reevaluate
Critical Decision Process

- Form a concept
  - Scene size up and initial assessment
  - Focused history and physical exam
- Interpret the data
  - Patient acuity
- When you can’t come up with a clear field diagnosis, treat what you find (if appropriate) & transport
Critical Decision Process

- Apply the principles
  - devise the management plan
- Evaluate
  - on-going assessment
- Reflect
  - QA with crew and ED physician
  - view chart audit it as a learning tool, not punishment
Reflective Vs. Impulsive

- **Reflective**
  - Taking your time to figure out what is wrong
  - Acting thoughtfully, deliberately, analytically
  - Good in the non-life threatening situations

- **Impulsive**
  - Acting instinctively
  - No time to think
  - Protocols, algorithm knowledge
  - Good in the obvious or potential life threatening situations
Divergent VS. Convergent

- **Divergent**
  - Takes into account all aspects of a complex situation
  - The patient down a 30 foot embankment with multiple injuries.

- **Convergent**
  - Focuses on the most important aspects
  - The patient that is apneic, with a pulse

*Experience teaches when to use which style*
Anticipatory Vs. Reactive

**Anticipatory**
- Anticipate and prevent
- Seen in the confident, experienced paramedics

**Reactive**
- Let’s see what happens first
- Seen in the less confident
- Can be costly to the patient
Thinking Under Pressure

- Develop “muscle memory”
- Inexperience causes “mental paralysis”
  - Practice, Practice, Practice
  - Take full advantage of lab time
  - Attend in-services with a new outlook
Putting It All Together

- Read the scene
  - Surroundings
- Read the patient
  - History /Physical
  - Vital Signs
- React
  - Decide what to do
  - Do it
- Reevaluate
  - Focused exam
  - Look for other problems
- Revise
  - Flexibility in the plan
- Review
  - I thought that tube went in there.
Summary

- maintain a working knowledge of anatomy, physiology and pathophysiology
- know the principles of emergency medicine
- gather information
- develop a working field diagnosis
- form a management plan
- evaluate the interventions
- compare your findings
What About Our Patient?

- the patient is “circling the drain”.
- now what?
What About Our Patient?

- always remember your basics.
- every advanced call has a basic component.
- don’t be afraid to use them but do know why.
  - defend your plan
Question # 1

Which of the following is an advantage of protocols, standing orders and patient care protocols?

A. they promote a standardized approach to patient care for classic presentations
B. they promote linear thinking and cookbook medicine in all situations
C. Allows for the paramedic to act as a physician
D. Use when you want
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Question # 2

You have assessed a patient to be hypoglycemic. What phase of the critical thinking process have you entered when you initiate your treatment?

A. concept formation
B. data interpretation
C. application of principle
D. reflection on action
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Question # 3

A patient with a history of COPD presents with signs of CHF, but is wheezing as well. Why is it difficult to follow standard protocol / standing orders in this situation?

A. transport is indicated as the patient meets more than one protocol

B. because despite the presenting signs, glucagon is indicated

C. COPD is a contraindication for NTG

D. COPD with bronchospasm and CHF are both present requiring the Paramedic to use critical thinking to identify priority treatments.
Question # 3

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Question # 4

In which situation would a paramedic most likely utilize critical thinking?

A. diabetic patient with blood sugar less than 4 mmol/l
B. a patient with a sore neck post MVC
C. a patient with an obvious anaphylactic reaction
D. A patient with a sore neck post MVC with severe SOB when supine
Question # 4

In which situation would a paramedic most likely utilize critical thinking?

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C. a patient with an obvious anaphylactic reaction
D. A patient with a sore neck post MVC with severe SOB when supine
Well Done!

Ontario Base Hospital Group
Self-directed Education Program
SORRY,
THAT’S NOT THE CORRECT ANSWER