



# Advanced Assessment Critical Thinking Skills

# ADVANCED ASSESSMENT

## Critical Thinking Skills

### AUTHORS

**Mike Muir AEMCA, ACP, BHSc**

Paramedic Program Manager  
Grey-Bruce-Huron Paramedic Base Hospital  
Grey Bruce Health Services, Owen Sound

**Kevin McNab AEMCA, ACP**

Quality Assurance Manager  
Huron County EMS

### REVIEWERS/CONTRIBUTORS

**Rob Theriault AEMCA, RCT(Adv.), CCP(F)**

Peel Region Base Hospital

**Donna Smith AEMCA, ACP**

Hamilton Base Hospital

**Tim Dodd AEMCA, ACP**

Hamilton Base Hospital

# 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
  - ◆ Medical Directives as per the ALS PCS

# Introduction

- \* Paramedic profession has changed
- \* 21<sup>st</sup> 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
- \* 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
SpO <sub>2</sub> 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



# 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 medical directives?

- 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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Which of the following is an advantage of medical directives?

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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

## Question # 2

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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 on 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.

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- 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 # 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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**B**

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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

