Poor Prognostic Indicators

Critical Decision Making for the EMT

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Content Outline

• Overview & Goals
• Definitions
• Patient Assessment Review
• Golden Rules
• Case Studies
• Summary
• Questions/Comments
Overview and Goals

- Develop critical thinking
- Utilize assessment skills to identify patients that require rapid intervention and treatment
- Utilization of additional resources
- Making the rapid transport decision
- Choosing the right place to take your patient
Gary and Stu’s tips on EMS
Survival #1

The Air goes in and out. The blood goes round and round.

Any deviation from that, is a bad thing
Critical Thinking
(Definition)

The intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action.

National Council for Excellence in Critical thinking Instruction.
Poor Prognostic Indicator

Definition

A ominous sign or symptom that usually is associated with poor patient outcome.
Patient Assessment Review

• Primary Survey = Initial Examination
• CUPS Determination/transport discussion
• Secondary Survey = Detailed Physical Exam
Primary Survey
(Initial Assessment)

• Check for immediate life threats.
• Airway, Breathing, Circulation, Neurogenic assessments
• Vitals signs should be estimated
  – Actual number is not as important as recognizing rates outside the normal limits
  – 60/70/80 Rule for Blood Pressure
Who are our patients?
Utilizing CUPS Determination

CUPS Status helps us classify our patients into categories that either require rapid intervention and transport or allows for extended scene time and delayed transport.

It identifies the Sick Sick from the Sick
CUPS Determination

C - Critical/CPR
• Cardiac/Respiratory arrest
• Patients being ventilated

U - Unstable
• Severe airway compromise
• Multi-system trauma
• Hidden Hemorrhage
• Respiratory Distress
• Chest pain
• Altered mental status/Unresponsive

P - Potentially Unstable
• Early signs of shock
• Hemodynamically stable patients with Significant Mechanism of injury
• Major isolated injury
• Altered mental status
• Most medical emergencies

S - Stable
• Single isolated injuries
• Uncomplicated medical emergencies
CUPS Determination

Critical & Unstable Patients
- Approx. 10% of our patients
- Require Rapid Intervention and Transport
- Consider ALS

These are the patients we can make a difference with

Load & GO

Potentially Unstable & Stable Patients
- Approx. 90% of our patients
- Extended scene time permissible
- ALS usually unnecessary

Stay & Play
Platinum 10 minutes

The First 10 minutes after initial injury.

Ideally C & U Patients should be identified, extricated and enroute within the Platinum 10 minutes.
Activities Within the Platinum 10

• Identify Critical & Unstable patients
• Assessment and treatment of life threatening injuries/illness
• Rapid extrication when indicated
• Timely transport to an appropriate facility
• Early alerting of the receiving facility
Secondary Survey Pitfalls
(Detailed Physical Exam)

- Completing Secondary Survey on a patient before life threats are managed
- Failing to complete a secondary survey on critical patients after life threats are managed
- Failing to complete a secondary survey on a stable patient
- Not obtaining the medical history on a trauma patient when possible
Scenario #1

You are called to the Scene of a Donor-Cycle Crash. You find the rider lying on the ground next to his bike. Witnesses state that the rider appeared to “lay the bike down”.

The Scene appears safe.
Primary (initial) Assessment

- **A**: Open and Clear
- **B**: RR= 26/min  LS: Clear  No apparent chest trauma
- **C**: PR= Radial pulse present. Weak and rapid. Skin is cool, clammy, and pale. No obvious external bleeding present
- **D**: Pearl, patient is alert but appears anxious
- **E**: No deformity noted
Discussion

• What type of conditions do you suspect?
• What is your CUPS status/ transportation decision?
• How often would you re-assess vital Signs?
• What interventions would you use?
• What additional resources would you need?
Upon Further Exam

• Head, neck and chest unremarkable
• Pupils are Sluggish
• Abdominal tenderness found in the URQ
• PR and RR still rapid and shallow
• The patient is taking longer to respond to your question
Shock
(Hypoperfusion Syndrome)

“A rude unhinging of the machinery of life”

Samuel Gross 1852
Shock
(Hypoperfusion Syndrome)

• The Body’s inability to meet it’s oxygen needs (poor tissue perfusion)

• Leads to anaerobic metabolism

Shock Is a Life Threatening Condition!!
Shock
(Hypoperfusion Syndrome)

Early Signs and Symptoms
• Altered Mental Status
• Tachycardia
• Tachypnea
• Diaphoresis
• Blood Pressure remains stable

Remember: Our job is to keep the patient from progressing past the early stages
Shock
(Hyperperfusion Syndrome)

Late Stages

• Pulse, Respiration, and Mental Status continue to decrease

• Blood Pressure Drops

Remember: If you wait for the Blood Pressure to Drop.... You Waited too long
Hidden Bleeding
things to remember

• Blood in the abdomen may not always cause pain or tenderness
• Retroperitoneal injuries are usually asymptomatic
• Mechanism of injury
• Level of Shock is greater than can by explained by visible injuries
• The patient can “bleed out” without any signs of external bleeding
Gary and Stu’s tips on EMS
Survival #2

All Bleeding stops eventually!
Scenario #2

You are called to the gym for a basketball player down. The player is a 24 y/o male complaining of sudden onset of chest pain and shortness of breath. Patient states he has a history of Asthma and that he used his MDI without relief.

The Scene is safe
Primary Assessment

- **A**: Open and clear
- **B**: RR= 22 and shallow. Obvious respiratory distress. Patient complains of pain on inspiration. LS: Diminished on left side but clear.
- **C**: PR: 110 radial pulses present. Skin is unremarkable
- **D**: PEARL. Patient is Alert
- **E**: No deformity noted, patient denies any contact took place during the game
Discussion

• What type of conditions do you suspect?
• What is your CUPS status/transportation decision?
• How often would you re-assess vital Signs?
• What interventions would you use?
• What additional resources would you need?
Upon Further Exam

- **S**: Pain on inspiration, increased SOB, Distended neck veins
- **A**: No known allergies
- **M**: Proventil MDI. Taken without relief
- **P**: Asthma
- **L**: Breakfast, 3 hours ago
- **E**: Just finished playing a varsity basketball game.
Upon Further Exam

• **A**: Clear

• **B**: 28 and Labored, No relief with oxygen. LS: Quiet on the left side. Increased JVD and tracheal shift towards the right

• **C**: PR: 126  BP: 100/70 Skin is cool, clammy, and pale

• **D**: Patient is becoming confused and sluggish with his responses
Spontaneous Pneumothorax

Things to Remember

Simple Spontaneous Pneumothorax

• Medical by nature- no associated trauma
• more common in adults between 20-40
  – Tall and thin
  – Males
• May not have any other known pulmonary problems.
Spontaneous Pneumothorax

Things to Remember

**Complex Spontaneous Pneumothorax**
Medical by nature - no associated trauma

- more common in adults >40
- Those with lung pathology at risk
  - Asthma
  - COPD
  - Cancer
  - TB
Spontaneous Pneumothorax

Things to Remember

Spontaneous Pneumothorax

• May occur right after exercise
• Can Quickly Progress to Tension Pneumothorax
• Needs ALS/Rapid transport for needle decompression
Scenario #3

You are doing a stand-by at a Baseball Game. You get called to the field to for the pitcher who was hit by a line drive on the side of the head. The Player is not moving. One of the trainers is holding in-line stabilization.

The Scene is safe
Primary (initial) Assessment

• A: Open and Clear. Gag reflex present
• B: RR= 22/min LS: Clear
• C: PR= 100 Radial pulse present. Skin is cool, clammy, and pale. No external bleeding present
• D: Pearl, patient withdraws to painful stimuli
• E: Obvious bruise to side of head.
Discussion

• What type of conditions do you suspect?
• What is your CUPS status/ transportation decision?
• How often would you re-assess vital Signs?
• What interventions would you use?
• What additional resources would you need?
Upon Further Exam

As you are preparing to immobilize your patient, he begins to stir.

• A: Clear Responsive to name only
• B: RR= 22 with high flow 02
• C: PR= 90. Skin remains Pale. BP: 146/90
• D: Patient responsive to name only
• E: No change.
During Transport

The patient has LOC

• **A**: No gag reflex.
• **B**: RR irregular. (Cheyne-Stokes) respiration's
• **C**: PR=68 BP=168/96
• **D**: Unresponsive with posturing. Pupils Fixed and dilated on the side of the injury
Closed Head Injuries

things to remember

Epidural Hematoma- Bleeding between the skull and the Dura mater

- Represent about 2% of all head injuries
- Common in blows to the side of the head
- Arterial bleeding in nature. Causes rapid change in LOC and vital signs
- Early S/S are similar to that of a concussion
Closed Head Injuries
things to remember

Epidural Hematoma-

- Important to monitor and transport all head injury patients with LOC.
- Period of lucidity followed by return of LOC.
- Unusual breathing patterns present.
Closed Head Injuries

things to remember

Subdural Hematoma - Bleeding between the Brain and the Dura mater

• Venous bleeding
• Early LOC
• S/S may be delayed up to 72 hours
• S/S vary based on the location of the Bleeding
Closed Head Injuries

things to remember

Signs of Intracranial pressure present

• Cushing’s triad
  – Rising blood pressure
  – Changes in breathing pattern
    • Cheyne-Stokes respirations
    • Central Neurogenic Hyperventilation
    • Ataxic (Medullary) Breathing
  – PR decreases
Closed Head Injuries

things to remember

• Change in Pupils
• Varying degrees of LOC
  – onset
  – duration
Closed Head Injuries

things to remember

• Spinal Precautions indicated
• Hyperventilation may be needed
  – Causes Vasoconstriction
  – May reduce swelling in the brain
  – Body is unable to regulate respiration
• Remember to treat for shock
• May hide other injuries due to the body’s compensatory mechanisms
Gary and Stu’s tips on EMS Survival #3

If it’s wet and sticky and it’s not yours…(or your Significant others)-

Don’t touch it without gloves!!
POOR PROGNOSTIC INDICATORS
Narrowing Pulse Pressure
Pericardial Tamponade

- Blood fills the pericardial sack causing a squeezing of the heart
- With each beat more pressure is added
- The heart cannot re-expand to refill for the next beat
- Beck’s Triad
  - Hypotension
  - Muffled heart sounds
  - Neck vein distention
Pericardial Tamponade

When systolic and diastolic pressure meet, no cardiac output is possible
Depressed respiratory rate and unresponsive to Pain. Patient has been Drinking
Alcohol Poisoning

- Alcohol is a CNS depressant
- Patient may be unable to maintain airway
- High risk of aspiration
- Can lead to Blindness, Coma, Death
- Rubbing alcohol can cause these problems even in small doses.
Gary and Stu’s tips on EMS Survival #4

If it’s 3:00 AM on a Saturday night and you’re at the Scene of a car crash. And no one around you is drunk-

Keep looking, someone is missing!
Mental Status Changes
Mental Status Changes

Mental status is the culmination of the function of organs in the body. The brain is very sensitive to disruptions in its environment. Mental status changes should serve as a red flag to the pre-hospital provider.

Pre-Hospital Emergency Care Secrets, 1998
Causes of Mental Status Changes

- A- Alcohol
- E- Epilepsy, Endocrine, Exocrine (Liver)
- I- Insulin
- O- Oxygen, Opiates
- U- Uremia (Kidney Failure)

- T- Trauma/
  Temperature Extremes
- I- Infection
- P- Poisons/Psychiatric
- S- Shock, Stroke,
Back Pain, Person >60, No Known Trauma/Prior Hx
Abdominal Aortic Aneurysm

• “Tearing” pain
• Pain shooting down the leg
• History of hypertension
• Presently hypotensive
• Blood pressure discrepancy between arms
• Poor distal pulses in the legs
Blunt Traumatic Arrest
Blunt Traumatic Arrest

Patients found in the field without vital signs following blunt trauma (i.e., Rapid deceleration injuries) have <.0001% chance of regaining vital signs. In these injuries the aorta shears off from the top of the left ventricle.

Does your system allow you to pronounce?
Paradoxical Chest Rise
Paradoxical Chest Movement

• Leads to Respiratory Distress
• Not easily managed in the field
• Often associated with Pneumothorax and Pericardial Tamponade
Asthma patient with normal respiration rate and diffuse wheezing and dyspnea
Severe stage of Asthma

- Indicates respiratory failure
- Impending respiratory arrest
- Patient may no longer have the capacity to perform the work of breathing necessary to maintain adequate oxygenation
- Sternal retractions and head bobbing in children
- Diminished lung sounds
The Quiet Child
Quiet Child

The Child who just sits there listless, “Floppy”, not interacting with caregiver or EMS. Not responding to your presence or interventions in any way (either crying, pulling away or even curious) is usually very sick.

The Quiet child is usually the sickest!
Gary and Stu’s tips on EMS Survival #5

The better the meal or the dream that got interrupted…

1) The longer the call will take.
2) The stupider the complaint will be
More Things to Remember
Vital Sign Abnormalities

- Tachycardias without any apparent explanation
- Traumatic bradycardias
- Orthostatic changes in vital signs in the suspected hypovolemic patient
- Hypertensive/hypotensive patients
- Diaphoresis, pallor, cyanosis
- Tachypnea, Hyperpnea, Bradypnea,
- Sudden unexplainable mental status changes
Vital Signs Abnormalities

Take the patient's age, past medical history and medications into account when deciding what is “normal” for your patients.

All Vital Sign changes form the normal limits require an explanation.
Gary and Stu’s tips on EMS
Survival #6

If it were not for stupid people……

We would be out of business
Making The Transport Decision
Making The Transport Decision

Where you decide to bring your patient (and by what means) depends on several factors:

- Patient Condition & Complaint
- Patient Choice
- Need for Specialty Referral Center (Tertiary Care Center)
- External factors (weather, patients in custody)
- Local/Regional Resources and Protocol
Making The Transport Decision

Patients in Extremis should go to the nearest 911 receiving Facility

- Respiratory/Cardiac Arrest (Actual or Impending)
- Patients being Ventilated with BVM
- Patients with unsecured airways
Specialty Referral Centers

- Trauma Centers
- Burn Centers
- Other
Trauma Center Candidates

Patients should be transported to Trauma Centers based on:

- Physiologic Parameters
- Types of injury
- Mechanism of injury
- Underlying medical problems
- Transport Time
Why Trauma Centers?

- Dedicated to trauma care
- Specialized Care (Staff trained in trauma care, familiar with obvious and hidden injuries)
- Specialized facilities (All necessary components are available 24/7)
- Specialty services (all necessary specialties and sub-specialties available 24/7)
Trauma Center Candidates
Physiologic Parameters

• Glasgow Coma Scale <12 or
• Systolic Blood Pressure < 90 or
• Respirator Rate <8 or > 29 or
• Revised Trauma Score <11
Trauma Center Candidates
Injury Type

- Penetrating injury to head, chest, abdomen, neck or groin
- Fracture of 2 or more proximal long bones
- Flail chest
- Pelvic Fractures
- Pelvic Fractures

- Open or depressed skull fractures
- Paralysis
- Amputation proximal to wrist or ankle
- Trauma associated with major burns
Trauma Center Candidates
Mechanism of injury

- High speed auto crash
- Fall of > 20 feet (> 2X height for peds)
- Ejected from vehicle
- Pedestrian/Bicyclist struck by vehicle
- Motorcycle Crash (>20mph or separation of rider)
- MVC rollover
- MVC with death of person in same vehicle
- Extrication time >20 minutes.
Trauma Center Candidates
Mechanism of injury
Trauma Center Candidates
Underlying medical problems

• Age <5 or > 55
• Known cardiac or respiratory disease
• Insulin dependant diabetes, cirrhosis, or morbid obesity
• Pregnancy
• Immunosuppressed Patients
• Patients with bleeding disorders or on anticoagulants
Trauma Center Candidates

When in doubt, take to a trauma center!!
Gary and Stu’s tips on EMS Survival #6a

Alcohol is good for Business
Burn Center Candidates
Burn Center Candidates

- Partial thickness burns >10% total BSA
- Burns to face, hands, feet, genitalia, perineum, or major joints
- Full thickness burns in any age group
- Electrical burns, including lighting injury
- Chemical burns
- Inhalation burns (after airway is secured)
- Burned patients with preexisting medical conditions
Burn Center Candidates

• Patients with burns to face, inhalation burns etc. should first have their airway protected (intubated) before transport to burn center.

• Patients who have both trauma and burn injuries should go to the trauma center if the trauma injuries are more severe than the burn.
Specialty Referral Centers

Other

• Hyperbaric Centers: Patients with CO poisoning, smoke inhalation, DCI
• Replantation Centers: Traumatic amputations
• Venomous bite centers
Summing it up!

The EMT is faced with many decisions during the course of treating patients. The use of critical thinking in conjunction with good patient assessment skills will help with the identification of critical/unstable patients and rapid treatment of lift threatening injuries.