INSTRUCTOR GUIDE

TOPIC: Trauma Assessment and Patient Destination

TIME REQUIRED: 2-3 Hours

MATERIALS: Appropriate audio/visual materials and equipment

REFERENCES: Prehospital Trauma Life Support, 5th Edition, Mosby
Maryland EMS Protocols

PREPARATION:

ATTENTION:

MOTIVATION: Assessment and triage of a trauma patient can be a difficult task. The use of organized and consistent assessment techniques can assist the EMS provider in recognition of those patients who have sustained potentially life threatening injuries. This recognition helps the EMS provider to decide the type of medical treatment the patient receives and to differentiate between patients who require immediate transport ("Load and Go") from those who would benefit from continued assessment and care on scene. Lastly, information gained from the assessment, along with knowledge of local trauma protocols, will help guide the EMS provider in transporting the patient to the most appropriate facility.

OBJECTIVE (SPO): The student will be able to discuss the rationale for performing an organized assessment as well as describe the proper assessment, management and destination decision for the trauma patient.

OVERVIEW:

<u>Trauma Assessment and Patient Destination</u>
* Introduction
* Scene / Situation Survey
* Primary Survey
* Identification of the Critical Trauma Patient
* "On Scene" Care of the Trauma Patient
* Secondary Survey
* Patient Destination

TRAUMA ASSESSMENT & PATIENT DESTINATION

SPO	The student will be able to discuss the rationale for performing an organized assessment as well as describe the proper assessment, management and destination decision for the trauma patient.
EO 1-1	Discuss the rationale for performing an organized assessment on a trauma patient.
EO 1-2	List the components of the scene/situation survey.
EO 1-3	Describe the primary survey that is performed on every trauma patient.
EO 1-4	Explain the importance of identifying a patient with a critical injury and the impact it may have on patient management.
EO 1-5	Describe the difference in the on-scene care of a patient with critical injuries as opposed to a patient with non-critical injuries
EO 1-6	List and describe the components of the secondary survey on a trauma patient.
EO 1-7	Describe how to utilize the Maryland Medical Protocols to determine the appropriate destination for a trauma patient.

I. INTRODUCTION (EO 1-1)

A. Epidemiology of trauma

1 Trauma is a "disease of the young"

a. Leading cause of death in patients aged 1-44 years old

2 3rd leading cause of death in all age groups

3 More than 60 million injuries occur annually in the United States

a. It is also a major problem worldwide

4 Many of these injuries may cause significant disability

5 Major financial losses too

a. Direct costs

b. Lost tax income

c. Lost productivity

d. Lost years of life

B. When do patients die from trauma?

1 Immediate (minutes to 1 hour)

a. Can only be prevented by injury prevention education

2 Early (within 4 hours)

a. May be prevented through appropriate prehospital care

3 Late (2 to 5 weeks)

a. May be prevented through prompt transport to a hospital appropriately staffed for trauma care.

C. What is the "Golden Hour"

1 R Adams Cowley described the "Golden Hour"

a. Patients with major trauma had higher survival rates if surgical intervention occurred within one hour of injury.

b. ***There is no definitive research that validates the time frame of one hour (60 minutes)***

i. Some patients have more than an hour, some have less

ii. The concept, though, is very important

a) The sooner we can get a patient with major injuries to a trauma center, the better the chances of survival

2 The "Golden Period" is probably a better description

D. What encompasses the "Golden Period"

1 7 different time periods

a. Time of injury to 911 call

b. Time of 911 call to EMS dispatch

c. Time of EMS dispatch to Ambulance response
d. Time of Ambulance response to arrival on scene
e. Time spent on scene with the patient
f. Time of Ambulance transport to the hospital
g. Time the patient spends in the emergency room prior to surgery

2. EMS Providers can only truly affect one of these time periods
    a. On scene time
        i. ***Note: Some students may feel that we can significantly affect response time and transport time by driving the ambulance faster. Research in this matter does not support this notion except when driving over long distances (Greater than 60 miles)***
    b. The American College of Surgeons and Prehospital Trauma Life Support (PHTLS) International have come to a consensus on the optimal on-scene time for major trauma
        i. 10 minutes
            a) K.A. "The Platinum 10 Minutes"

E. The Platinum 10 Minutes
1. Factors that help EMS providers attain the 10 minute on-scene goal when treating the patient with critical trauma
    a. Rapid & efficient assessment of the scene and patient
        i. Helps to identify patients with critical injuries
    b. Limit on-scene care to addressing life threatening issues only
    c. Effective teamwork to rapidly package the patient
    d. Initiation of timely transport to an appropriate facility
        i. Performing additional assessment and care during transport

F. Special Considerations with Helicopter Transport
1. Trauma Center accessible by ground (Approximate 25 minute transport time)
    a. Transport should be initiated as soon as possible once in the ambulance
2. Trauma Center better accessed by helicopter
    a. Because of the number of variables associated with calling a helicopter to a trauma scene, it is unlikely that the goal of transporting the patient within 10 minutes of ambulance arrival will be met.
    b. Ground crews should, though, still work to meet the goal of having the patient in the ambulance within 10 minutes of arrival on scene

i. Increases the likelihood that all assessment and care that can be performed by the ground crew will be completed prior to the arrival of the helicopter.
    a) Facilitates a smoother and faster transfer of patient care.
    b) Decreases the amount of time the helicopter remains on scene
    c) Decreases the amount of time it takes to get the patient to the hospital (Which is our overall goal anyway!)

II. SCENE / SITUATION SURVEY (EO 1-2)

A.Scene situation survey encompasses two divisions

1 Scene Safety

2 Situation

B.The survey begins upon dispatch prior to arrival

1 Information from dispatch can provide

a.Information about the incident

b.Information about known hazards

c.Information about available resources

C.Scene Safety

1 What are the components for assessing scene safety

a.Ensure safety of rescuers and patients

b.Threatening situations may include

i. Fire

ii. Electrical lines

iii.Hazardous materials

iv.Blood and body fluids

v. Traffic

vi.Weapons

vii.Environmental conditions

viii.***Can students think of any others?

D.Scene Situation

1 Survey of the situation helps to identify

a.What really happened?

b.What is the mechanism of injury to the patient?

c.How many patients are involved.

i. What are their ages

a) Why is this important?

1) It may help to identify the need for pediatric specific resources or transport destinations

d. Are any additional resources needed?
    i. Examples include
        a) Fire Suppression
        b) Rescue & Extrication
        c) HazMat
        d) Tactical Rescue
        e) Shock Trauma Go Team

e. How will the patients be transported?
    i. Examples include
        a) Ambulances
        b) Helicopters
        c) Buses (Mass Casualty)

III. BODY SUBSTANCE ISOLATION

A. Prior to beginning any physical assessment, the EMS provider should take body substance isolation (BSI) precautions

B. BSI precautions can include
    1 Gloves
    2 Eye protection
        a. Especially if the patient has any potential for "spurting" fluids
    3 Masks
    4 Gowns

IV. PATIENT ASSESSMENT OVERVIEW

A. The patient management for trauma is divided into 4 segments
    1 Primary survey
        a. Identifies life-threatening conditions
        b. "Treat as you go"
            i. It is recommended that when an EMS provider finds a life threatening condition, it is managed immediately
                a) ***Note-This can be performed by other providers as directed by the one performing the assessment
    2 Resuscitation
        a. Manage life threatening conditions on scene
        b. Package the patient for rapid transport (if indicated)
    3 Secondary survey
        a. More detailed assessment
            i. Head to toe

b.Performed in ambulance for critical patient
c.Performed on scene for non-critical patient

4 Definitive care in the field
a.Address all injuries as time allows
b.Performed in ambulance for critical patient
c.Performed on scene for non-critical patient

V. PRIMARY SURVEY (EO-1-3)

A.The primary survey should be performed on every potential trauma patient

1 The information gathered in the primary survey will assist the EMS provider in deciding whether or not the patient is critical
a.Critical patients are managed differently than non-critical patients

B.Performed in an "A-B-C-D-E" format

1 Airway with C-spine
2 Breathing
3 Circulation
4 Disability
5 Expose / Environment

C.Airway

1 Assessment
a.Assess for patency
b.Open the airway while protecting cervical spine
i. Utilize modified-jaw-thrust technique

2 Potential Life Threatening Airway Conditions
a.Obstruction
i. Tongue
ii. Blood / Fluid
iii.Foreign Body

3 Potential Airway Treatments
a.Manual opening of the airway (Modified Jaw Thrust)
b.BLS Airway usage
i. Oropharyngeal airway
ii. Nasopharyngeal airway
c.Suction
d.Endotracheal Intubation (Advanced Life Support)

D.Breathing

1 Assessment

a. Estimate rate of ventilations
    i. Does not require an exact "number"
    ii. Should be thought of as "Fast", "Normal" or "Slow"
        a) An exact number can be obtained later in the secondary survey
b. Assess depth of respirations
    i. "Deep", "Normal", "Shallow"
c. Listen to Lung Sounds
    i. ***VERY IMPORTANT***
        a) Many students think of lung sounds as a secondary survey assessment.
        b) The sooner a deficiency can be identified in a patient's respiratory system, the sooner treatment can begin (May require ALS intervention)
    ii. Listen at 5th intercostal space, midclavicular line
        a) "Armpits"
    iii. Assess for presence and sounds
        a) Does not require a detailed assessment. Just the two armpit locations

2 Potential Life Threatening Breathing Conditions
a. Shortness of Breath
b. Abnormal Breathing
    i. Apnea
    ii. Shallow Tidal Volume
    iii. Irregular Patterns
c. Diminished or Absent Lung Sounds
    i. Hemothroax
    ii. Pneumothorax / Tension Pneumothorax
d. Crackles / Fluid in Lungs / Pulmonary Edema

3 Potential Breathing Treatments
a. Oxygen administration
    i. Nonrebreather Mask
    ii. Nasal Cannula
b. Bag-Valve-Mask Ventilations with supplemental oxygen

E. Circulation

1 Assessment
a. Is there any uncontrolled external hemorrhage?
b. Pulse
    i. Feel at the neck(carotid) and the wrist (radial)

ii. Estimate rate
a) Do not need exact number
1. "Fast","Normal" or "Slow"
2. Can get exact number in secondary survey
iii. Note quality (strength)
a) Signs of shock include
1. Weak carotid pulse
2. Weak or absent radial pulses

c. Assess Skin
i. Color
a) Normal (pink mucosa), pale, flushed, cyanotic
ii. Temperature
a) Hot, warm, cool, cold
iii. Moisture
a) Normal (dry), diaphoretic
iv. Capillary refill time
a) Normal, Delayed (> 2 seconds)

2 Potential Life Threatening Circulatory Conditions
a. Hemorrhage
i. External
ii. Internal
b. Shock

3 Potential Circulatory Treatments
a. Control external hemorrhage
i. Direct pressure/pressure dressing
ii. Elevation, pressure points, tourniquets as needed
b. ***NO IV LINES***
i. While IV access may be performed by properly certified personnel, it should not be done in the primary survey. It should not be initiated until the patient is within the ambulance.

F. Disability
1 Assessment
a. Assess Level of Consciousness
i. Utilize the Glasgow Coma Scale
a) Eye Opening
1. 4 – open spontaneously
2. 3 – open to verbal command
3. 2 – open to painful stimuli

4. 1 – no opening

b) Verbal Response
1. 5 – oriented
2. 4 – confused, disoriented
3. 3 – inappropriate words
4. 2 – incomprehensible sounds
5. 1 – no verbal response

c) Motor Response
1. 6 – follows commands
2. 5 – localizes to pain
3. 4 – withdraws to pain
4. 3 – abnormal flexion (decorticate posturing)
5. 2 – abnormal extension (decerebrate posturing)
6. 1 – No motor response

ii. A Quick Method to use the GCS

a) "Open your eyes"
1. If eyes open already – 4
2. If opens eyes to command – 3
3. If no eye opening to command, administer nailbed pressure (pain). If eyes open to pain-2.
4. If eyes do not open to the pain – 1

b) "What happened to you"
1. Note what the patient's verbal response is to your question

c) "Hold up two fingers"
1. If the patient holds up two fingers, he/she receives a 6 for motor response
2. If the patient does not follow the command, administer nailbed pressure (pain) then record the patient's motor response.

b. Assess Pupils

i. Reactivity

ii. Equality

2 Potential Life Threatening Disablity Conditions

a. Unconsciousness

b. Altered Mental Status

c. Suspected Head Injury with unequal pupils

3 Potential Treatments
a.No specific treatments in the primary survey

G.Exposure / Environment
1 Expose the patient as the environment allows to assess for other life threatening conditions
a.May not be noticeable with clothing on
b.Clothing can absorb large amounts of blood
2 After exposure, cover to maintain body heat
a.Hypothermia can worsen outcome from shock.

VI. IDENTIFICATION OF THE CRITICAL TRAUMA PATIENT (EO-1-4)
A.Upon completion of the primary survey, the EMS provider has enough information to identify if the patient appears critical

B.A critical trauma patient may present with one of the following
1 Inadequate or threatened airway
a.For example coma, obstruction, airway burns
2 Impaired ventilations
a.For example decreased tidal volume, decreased respirations
3 Hemorrhage
a.For example significant external or suspected internal hemorrhage
4 Shock
5 Abnormal neurologic status
a.For example GCS < 15 or neurologic deficits
6 Penetrating trauma to head, neck, torso or proximal to elbows/knees
7 Amputation or near amputation
a.For example mangled extremity

C.A critical trauma patient will be managed differently than a non-critical trauma patient
1 Platinum 10 minutes
2 Limited on scene care
3 Initiate rapid transport to a trauma center

VII. ON SCENE CARE OF THE TRAUMA PATIENT (EO-1-5)
A.For patients identified as critical:
1 EMS providers should attempt to begin transport within 10 minutes
2 Medical care should be limited on scene to addressing life threatening issues only

a. Airway management
    i. BLS maneuvers, OPA/NPA, suction, intubation
b. Oxygen administration
c. Supplemental ventilations with BVM
d. Control external hemorrhage
e. NO IVs! – Should be deferred until in ambulance
    i. May be appropriate if the patient is entrapped during extrication
f. NO BLOOD PRESSURES! – Should be deferred until in ambulance
    i. This information is not necessary on scene and will only take time and resources away from moving the patient to the ambulance in a rapid fashion

3. Patients should be packaged rapidly
    a. May include C-spine immobilization if indicated
4. Secondary survey and definitive care should be deferred until transport has been initiated.
    a. See below for secondary survey format
5. Patient should be transported to a trauma center unless otherwise directed by protocol or on-line medical direction

B. For patients identified as non-critical

1. There is no need to leave the scene rapidly unless other external factors create a hazard
2. Secondary survey can be performed on scene prior to transport
    a. See below for secondary survey format
3. Definitive care should be performed prior to transport
4. Patient comfort should be considered.
5. Patient should be transported to a medical facility as dictated by medical protocol or on-line medical direction
    a. May be a trauma center or a local hospital

VIII. SECONDARY SURVEY (EO-1-6)

A. There are 3 main components to the secondary survey

1. Vital Signs
2. AMPLE history
3. Head to toe assessment

B. Obtain a full set of vital signs

1. Obtaining numerical values for vital signs in the primary survey was not necessary. Now the provider should obtain values for the following:

a. Blood pressure
b. Pulse
c. Respirations
d. Oxygen Saturation
e. ECG (if ALS)

C. Obtain an AMPLE history
1. This includes:
   a. Allergies
   b. Medications
   c. Past Medical History
   d. Last Meal
   e. Events Prior to Traumatic Incident
2. This information may be obtained by direct questioning of the patient, statements from family/friends/bystanders or by examining the patient's body for medical alert tags
   a. This information may be important to obtain early if the patient is at risk for losing consciousness.

D. Head-to-Toe Exam
1. Body systems are generally assessed for "DCAP-BTLS"
   a. Deformities
   b. Contusions
   c. Abrasions
   d. Penetrations
   e. Burns
   f. Tenderness
   g. Lacerations
   h. Swelling
2. Head
   a. In addition to DCAP-BTLS
      i. Assess the ears, nose and mouth for blood/fluid
      ii. Assess the pupils for equality and reactivity to light
3. Neck
   a. In addition to DCAP-BTLS
      i. Assess the neck for distended jugular veins
      ii. Assess the trachea (is it midline or deviated at the sternal notch)
      iii. Assess for subcutaneous emphysema
         a) Will feel like "rice krispies" under the skin

4 Chest
    a. In addition to DCAP-BTLS
        i. Look at the chest for symmetrical chest rise
        ii. Look at the chest for paradoxical movement
            a) Indicates a possible flail chest
                1. 3 or more ribs broken in two or more places
        iii. Palpate the chest for crepitus or instability
        iv. Listen to lung sounds
            a) Should be the 2nd assessment of lung sounds
            b) Can be assessed in multiple locations
5 Abdomen
    a. In addition to DCAP-BTLS
        i. Look for abdominal distention
        ii. Palpate for abdominal rigidity
            a) May indicate abdominal bleeding
        iii. Do not listen for abdominal sounds
            a) Takes a number of minutes perform correctly
            b) Does not provide useful information to guide EMS treatment
6 Pelvis
    a. In addition to DCAP-BTLS
        i. Palpate straight down (anterior surface of pelvis)
        ii. Palpate both areas where the femur attaches to the pelvis
            a) If instability is felt, the patient may have a fractured pelvis
                1. 20% Mortality rate for untreated pelvic fractures.
7 Legs
    a. In addition to DCAP-BTLS
        i. Palpate both legs
        ii. Assess distal neurologic function
            a) Distal pulse (dorsalis pedis)
            b) Sensation
            c) Motor function
8 Arms
    a. In addition to DCAP-BTLS
        i. Palpate both arms
        ii. Assess distal neurologic function
            a) Distal pulse (radial pulse)
            b) Sensation

c) Motor function

E. Remind students when to perform secondary surveys
1 Critical patients
a.During transport , or
b.In the ambulance awaiting helicopter transport
2 Non-critical patients
a.On scene prior to transport
i. May be performed in the ambulance if the environment does not allow for assessment in the field

IX. DEFINITIVE CARE IN THE FIELD

A.Definitive care in the field is treatment that generally addresses injuries that are not life threatening

B.Usually performed after the secondary survey

C.Definitive care includes
1 Spinal Immobilization
a.May be performed earlier as part of patient packaging for a critical trauma patient
2 Establish IV access
a.May be performed shortly after movement of patient to ambulance
i. In conjunction with secondary survey
3 Splint musculoskeletal injuries
a.Helps to facilitate patient movement
b.Helps to decrease pain
c.Helps to decrease the incidence of fat embolisms after a fracture
4 Dress wounds
a.Apply sterile dressing to soft tissue injuries that were not life threatening

X. PATIENT DESTINATION (EO-1-7)

A.A decision has to be made as to where to transport a patient and what mode of transport to utilize

B.Mode of Transport
1 Generally two types

a. Ambulance
    i. Acceptable mode of transport if transport time is "reasonable."
        a) Most experts agree that a transport time of 20-25 minutes is acceptable for ground transport to a trauma center
    ii. No weight restrictions
    iii. Generally little restriction on continued assessment and treatment
b. Helicopter
    i. Good mode of transport to cover long distances
    ii. Smaller compartment size limits the number of rescuers
    iii. Some compartment designs make certain patient treatment and assessment difficult in flight, requiring almost all treatment be performed prior to lift off.

C. Destination

1. Critically injured patients should be transported to a designated trauma center with immediate surgical capabilities if available.
2. Maryland has created a triage decision tree to identify which patients should be transported to a trauma center.
    a. Utilizes criteria based on physiology, anatomy, mechanism of injury and preexisting conditions.
    b. Categorized as A, B, C or D
3. Category A Criteria
    a. These patients should be transported to a trauma center. Emergency transport should be considered as these situations are often potentially life threatening
        i. GCS < 8
        ii. Adult Blood Pressure < 90 systolic
        iii. Pediatric Blood Pressure < 60 systolic
        iv. Respiratory Rate less than 10 or greater than 29
        v. Flail Chest
        vi. Pelvic Fracture
        vii. Rapidly declining GCS
        viii. Penetrating injuries to head, neck or torso
        ix. Two or more proximal long bone fractures
            a) Long bone = femur or humerus
4. Category B Criteria

a. These patients should be transported to a trauma center. Some of these conditions are potentially life threatening and some are potentially limb threatening. The decision for emergency vs non emergency transport should be made based upon the patient's condition
    i. GCS 8-14
    ii. Paralysis or vascular compromise of limb
    iii. Penetrating injuries to extremities proximal to elbow & knee
    iv. Amputation proximal to wrist and ankle
    v. Combination of trauma with burns

5 Category C Criteria
a. These patients should be transported to a trauma center. The situations in this category describe mechanisms of injury that have been associated with significant injury. It is possible, though, that a patient involved in this situation may not be experiencing any critical injuries. Therefore, the mode of transport (ambulance vs. helicopter, emergency vs non-emergency) should be based upon the patient's condition
    i. Ejection from automobile
    ii. Death in the same passenger compartment
    iii. Extrication time greater than 20 minutes
    iv. Fall greater than 3 times the patient's height
    v. Vehicular rollover
    vi. High speed auto crash
    vii. Initial speed greater than 40 mph
    viii. Major auto deformity greater than 20 inches
    ix. Intrusion into passenger compartment greater than 12 inches
    x. Auto/pedestrian or Auto/bicycle injury with significant impact (>5 mph)
    xi. Exposure to blast or explosion
    xii. Pedestrian thrown or run over
    xiii. Motorcycle crash > 20 mph
    xiv. Motor cycle crash with separation of rider from motorcycle

6 Category D Criteria
a. This category lists situations or medical conditions that a patient may have that make him/her more susceptible to traumatic injuries. They are referred to as "Co-morbid" factors. If a patient has experienced a traumatic incident and does not fall into Criteria A, B or C, you should check to see if they have any of those factors. If they do fall into Category D, you may consider transport to a

trauma center. It is recommended, though, that you consult with online medical direction as the local hospital may feel comfortable caring for the patient. In most circumstances, emergency transport is not warranted for these patients.

i. Age less than 5
ii. Age greater than 55
iii. Cardiac disease
iv. Respiratory disease
v. Insulin dependant diabetes
vi. Cirrhosis of the liver
vii. Morbid obesity
viii. Pregnancy
ix. Immunosuppressed patients
x. Patient with a bleeding disorder or on anticoagulants

7 Always remember, though, that when in doubt, transport the patient to a trauma center.

XI. PRACTICE PATIENT SCENARIOS

A. Instructor should create patient care scenarios. These can be utilized, as time permits, to practice the trauma assessment presented in this drill. Information should be provided for the following patient assessment categories:

1 Scene Assessment
2 Mechanism of injury
3 Primary Survey
4 Critical vs. non-critical patient
5 Secondary Survey
6 Suggested management of patient care
7 Reassessment

B. The best method of practicing this, is to encourage the students to be as “hands-on” as possible with their physical assessment of the patient and treatment of the patient.

C. While moulage is not necessary, its use can enhance the learning experience and make training more realistic.

SUMMARY

REVIEW:

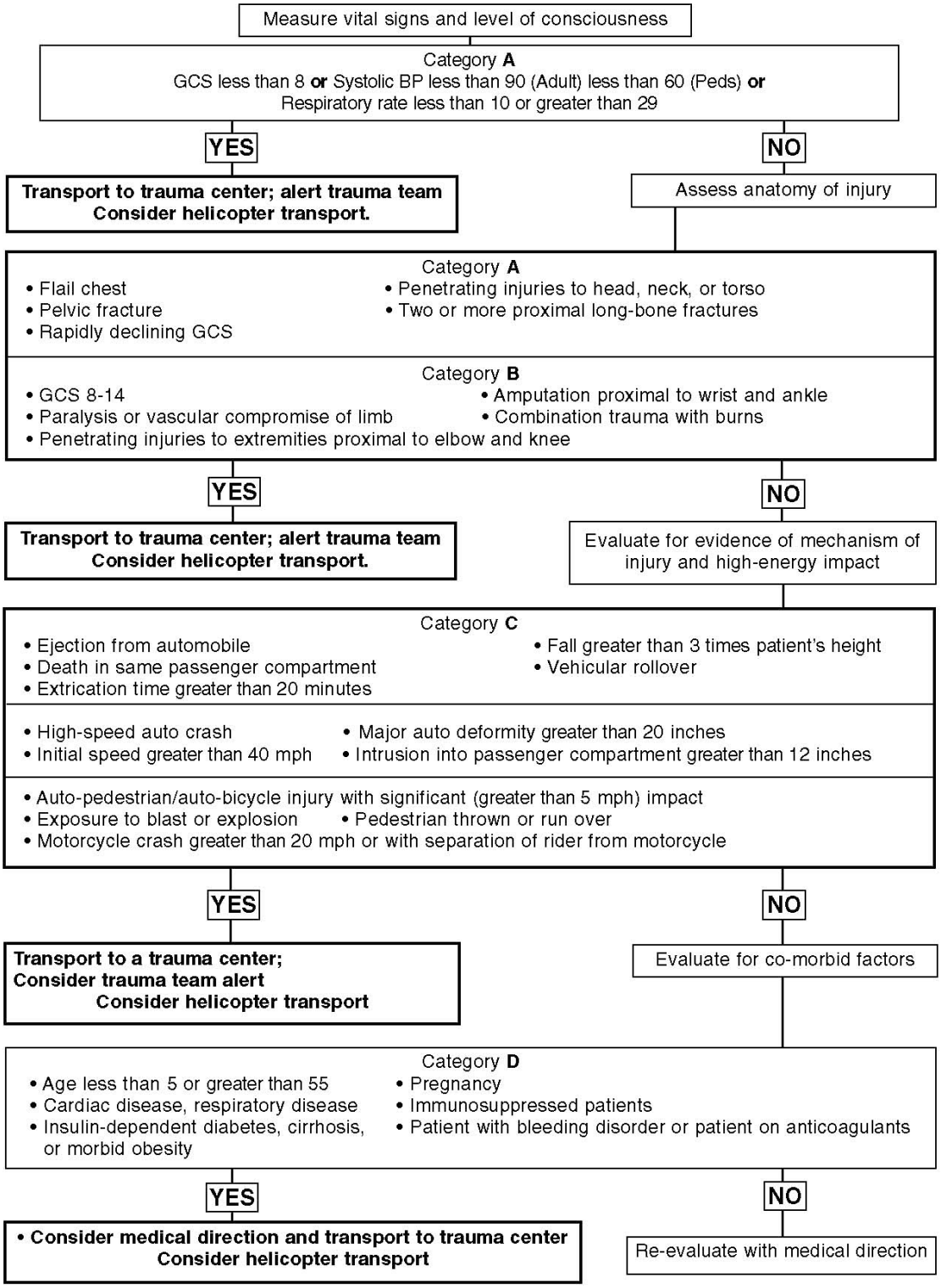
Trauma Assessment and Patient Destination
* Introduction
* Scene / Situation Survey
* Primary Survey
* Identification of the Critical Trauma Patient
* “On Scene” Care of the Trauma Patient
* Secondary Survey
* Patient Destination

REMOTIVATION: It has been said that the fate of the wounded lies in the hands of the one who applies the first bandage. Research has also shown that the care a trauma patient receives within the first hour after injury can have an affect on their outcome 2 to 20 days later. By performing good assessments, providing quality care and initiating transport to the most appropriate facility for the situation, we can give our trauma patients the best possible chances for recovery.

ASSIGNMENT:

EVALUATION:

SS. TRAUMA DECISION TREE



PHTLS
Assessment

Scene Survey

Scene safety, BSI, Mechanism of injury, Number of victims
Need for additonal resources, General impression

A - Airway (with cervical spine immobilization)

With cervical spine immobilization. Suction? Airway Adjuncts?

B - Breathing (with chest exam/ lungs sounds)

Approximate rate and depth. Need for 0_2. NRB? BVM?

C - Circulation (feel carotid and radial pulses)

Approximate rate and quality. Gross bleeding? Skin signs?

D - Disability

Assess initial level of consciousness with GCS

E - Expose (strip and flip)

Examine for other life threatening injuries

****Remember to cover patient back up to prevent hypothermia****