

SECTION: Adult Trauma Emergencies

PROTOCOL TITLE: Injury – General Trauma Management

REVISED: 06/2015

OVERVIEW

Each year, one out of three Americans sustains a traumatic injury. Trauma is a major cause of disability in the United States. According to the Centers for Disease Control (CDC) in 2008, 118,021 deaths occurred due to trauma. Trauma is the leading cause of death in people under 44 years of age, accounting for half the deaths of children under the age of 4 years, and 80% of deaths in persons 15 to 24 years of age.

As a responder, your actions within the first few moments of arriving on the scene of a traumatic injury are crucial to the success of managing the situation. Within these moments, you must size up the situation, mitigate as many hazards as possible, establish incident command, rapidly triage patients and ultimately assess, treat and extricate patients from the scene. In doing so, you must decide when to extricate a patient and what treatment is essential to improve the patient's chances of survival, based on your knowledge, previous experience and a problem-based assessment algorithm.

Rapid transport of the trauma patient is essential to improving patient outcome.

The trauma patient varies in presentation based on the type and mechanism of injury. Primarily, the pre-hospital EMS provider is concerned with five areas in the field; securing the scene to protect both rescuers and patients, conducting a primary assessment and managing any life threats, performing a rapid trauma assessment, extricating the victim rapidly while protecting the cervical spine, and immobilizing and transporting the victim to an appropriate facility while conducting a secondary and ongoing surveys.

SCENE SURVEY:

Summary of Scene Survey

Evaluate situation / scene for potential safety hazards.

Obtain an overview of the scene to determine Mechanism of Injury (MOI) include damage to vehicle, structures, furniture, etc.

Wear personal protective equipment (PPE) appropriate to hazards of the scene and / or patient.

Gain access to the patient.

Determine the number of patients and additional resources needed.

As with all scene responses, assessment of the situation begins from the moment of first dispatch. You must not only consider the information received, but take into account the time of day, traffic, weather, safety issues and potential resources that may be required. As you arrive, the first concern should be to assess the scene for safety of responding pre-hospital EMS providers and to develop an index of suspicion for potential injuries based upon the scene and mechanism of injury. Your safety always comes first, followed by your team, then your patient. Once it is determined that the scene is manageable, begin patient triage. There has been some controversy as to which triage method or methods should be used, as there are at least, nine different triage tools available

worldwide, including two pediatric versions, but there is little evidence supporting one method over the other. The most common methods found in literature are Simple Triage and Rapid Treatment (START) and JumpSTART (the pediatric version of START), which are both used in North America.

PRIMARY ASSESSMENT:

Once all hazards have been mitigated and you can safely function, you should continue on to the primary assessment to look for any life-threatening injuries. These are injuries and instability of the respiratory and cardiovascular systems that would most likely be fatal within minutes if they are not immediately found and corrected. The approach to the trauma patient is based on the same primary assessment of the patient's airway, breathing, circulation, neurologic disability, and exposure used for all patients. Unlike a medical patient, the mechanism of injury should also be quickly determined and considered.

A. AIRWAY / C-SPINE STABILIZATION / LEVEL OF RESPONSIVENESS:

Summary of Primary Airway, C-spine, and LOC Assessment

Airway: Patent, maintainable, un-maintainable
 Level of consciousness, altered mental status
 Skin appearance: Ashen, pale, gray, cyanotic, or mottled
 Facial fractures, head fractures, C-spine step-off
 Airway clearance
 Sounds of obstruction
 Glasgow coma scale, AVPU

Summary of Primary Disability (Neurological) Assessment

A.V.P.U.	Glasgow Coma Scale (GCS)		
A - Alert V - Responds to verbal stimuli P - Responds to painful stimuli U - Unresponsive	Eye Opening:	Spontaneous	4
		To voice	3
		To pain	2
		No response	1
	Verbal Response:	Oriented	5
		Confused	4
		Inappropriate words	3
		Incomprehensible	2
	Motor Response:	No response	1
		Obeys commands	6
		Localizes (pain)	5
		Withdraws (pain)	4
	Flexion (pain)	3	
	Extension (pain)	2	
	No response	1	

Summary of Primary -- Breathing Assessment

Rate and depth of respirations
Cyanosis
Position of the trachea
Presence of obvious injury or deformity
Work of breathing
Use of accessory muscles
Flaring of nostrils
Presence of bilateral breath sounds
Asymmetric chest movements
Palpation of crepitus
Integrity of chest wall

B. BREATHING:

Once the airway is assessed and managed, a quick assessment of the patient's breathing should be performed. If weather permits, and a chest injury is suspected, exposing the chest is prudent. With a stethoscope in one hand, wrap both hands around the patient's chest high along the mid-axillary line, then repeat on the other side. This allows you to assess for the presence or absence of breath sounds and to feel for equal expansion, crepitus and / or flail segments while visualizing for any injuries. Treatments that may be initiated here include high-flow oxygen, manual ventilations, sealing penetrating chest wounds and decompressing a suspected tension pneumothorax.

C. CIRCULATION:**Summary of Primary Circulation Assessment**

Pulse rate and quality
Skin appearance: Color
Peripheral pulses
Skin temperature
Level of consciousness
Open wounds
Arterial and/ or venous hemorrhage

RAPID TRAUMA ASSESSMENT:

A rapid trauma assessment is indicated for any patient whose MOI involves environmental factors (burns, drowning, toxic inhalation, etc), motion, or the transfer of a significant amount of energy to that patient (motor vehicle collisions, projectile penetrations, rapid deceleration, etc). As the primary assessment is meant to look for injuries and conditions that may be fatal in minutes, the rapid trauma assessment looks for injuries or conditions that are more subtle or may not be evident for a longer period (15 - 30 minutes).

As others are preparing for the extrication, do a very rapid trauma assessment looking for gross injuries that may pose a problem during extrication, such as multiple long bone or pelvic fractures that may cause pain, further injury and hemorrhage if care is not taken

when moving the patient from the vehicle to a backboard. Although this maneuver is "*rapid*" it does not allow for compromise of the cervical spine. Cervical spine injuries should be considered in all trauma patients until they can be ruled out by appropriate medical personnel. A stiff cervical collar, backboard, spider straps, head blocks, and tape, or an appropriate substitution as the need or situation arises, should be used to protect the cervical spine during transport. Neurological assessments of all extremities should be performed and documented before and after all immobilization.

To properly perform the rapid trauma assessment, the patient must be fully exposed. Do not feel guilty about cutting away obtrusive clothing if there is a high index of suspicion for injuries based upon the mechanism; however, take into account when and where you expose the patient. If there is a large crowd, maintain the patient's modesty by exposing only what is vital to the assessment and treatment and / or shielding the patient from the crowd with sheets or tarps. Also consider body temperature during exposure, as patients rapidly lose body heat through convection and radiation to the surrounding environment. No matter the temperature outside, always cover the patient with sheets or blankets and consider turning the air-conditioning down, or off, in the ambulance, as cold blood is less likely to clot and trauma patients are more prone to hypothermia.

If any serious conditions are found during the rapid trauma assessment, stabilize the patient as soon as possible, but determine to what extent. Look at the patient's overall condition and perform a risk-benefit analysis to determine if the proposed treatment would make a difference in the outcome versus how long it would take to accomplish that treatment considering the patient's other injuries. Also consider whether the desired treatment could be done safely enroute to the intended receiving facility.

Always be aware of the time you are spending on scene or on a particular task and be ready to transport if the patient's condition changes. Transport to the closest hospital is always warranted if you are unable to obtain or maintain an airway. Notify the hospital of the airway problem so they can have the appropriate equipment, medications, and personnel in place prior to the patient's arrival.

SECONDARY ASSESSMENT:

Typically, the secondary assessment begins once any life threats to the patient's airway, breathing, and circulation have been managed and any major injuries are stabilized. In a trauma situation, parts of the secondary assessment may occur simultaneously with other assessments, but should never interfere with them. The ability to do this is directly dependent upon the number of people available and the space within which providers have to work.

VITAL SIGNS:

When and where you obtain vital signs is directly related to the severity of the patient's condition, the number of responders on the scene, and available access to the patient. Vital signs are commonly left until the patient is in the ambulance and all critical and essential treatment has been established. Occasionally, when there are enough responders, one person may be delegated to obtain vital signs, but remember that this should not delay transport.

Vital sign trending is the practice of continually retaking vital signs to identify changes in patient condition. In the trauma patient, this occurs minimally every five minutes, or whenever the patient's condition changes. Trending will help to determine patient stability and alert providers to impending problems.

ONGOING ASSESSMENT:

The ongoing assessment involves continual reassessment of the patient any time his or her condition changes; an intervention is performed; or after any movement. Regularly reassess the patient's ABCs. Assessing mental status, performing baseline and repeat Glasgow Coma Scale scoring, and checking / rechecking the pupils will help determine any changes in the patient's neurologic status. Constant assessment of neurovascular status will alert you to developing paralysis, shock or a splint that is improperly applied. Subjective information such as asking the patient if s/he is feeling better or worse should be included. And finally, reassessing after interventions is important and may include effectiveness and tightness of splints, patency and flow rates of intravenous lines, and confirmation of endotracheal tube placement.

Summary of Secondary Assessment

Skin	<ul style="list-style-type: none"> • Presence of petechia, purpura, abrasions, bruises, scars, or birthmarks • Lacerations, uncontrolled hemorrhage • Rashes • Abnormal skin turgor • Signs of abuse or neglect
Head and Neck	<ul style="list-style-type: none"> • Presence of lacerations, contusions, raccoon eyes, • Battle's sign, or drainage from the nose, mouth, and / or ears • Gross visual examination • Abnormal extra-ocular movements • Position of the trachea • Neck veins • Swallowing difficulties • Nuchal rigidity • Presence of lymphadenopathy or neck masses • Vertebral step-off
Ears, Nose, and Throat	<ul style="list-style-type: none"> • Hemorrhage • Drainage • Sunken eyes • Gross assessment of the hearing • Obstruction • Foreign body
Mouth and Throat	<ul style="list-style-type: none"> • Mucous membranes • Drooling • Breath odor • Drainage • Injuries to teeth • Airway obstruction
Thorax, Lungs, and Cardiovascular System	<ul style="list-style-type: none"> • Breath sounds • Open Pneumothorax • Crepitus • Paradoxical motion • Heart Sounds
Abdomen	<ul style="list-style-type: none"> • Shape and size • Bowel sounds • Tenderness • Rigidity • Evisceration • Masses (i.e. suprapubic masses) • Pelvic tenderness, crepitus, or instability

Genitourinary	<ul style="list-style-type: none"> • Rectal bleeding • Color of urine
Extremities and Back	<ul style="list-style-type: none"> • Gross motor and sensory function • Peripheral pulses • Lack of use of an extremity • Deformity, angulation • Wounds, abrasions • Vertebral column, flank, buttocks • Equipment is appropriately applied (i.e. traction splints, extremity splints, cervical collar)

Assessment Acronyms		
S.A.M.P.L.E.	O.P.Q.R.S.T.	
S Signs and Symptoms	O Onset (When did the problem / pain begin?)	
A Allergies	P Provocation (What makes the problem / pain worse?)	
M Medications	Q Quality (Can you describe the problem / pain?)	
P Pertinent past medical history	R Radiation (Does the pain move anywhere?)	
L Last oral intake	S Severity (On a scale of 1 - 10, how bad is the pain?)	
E Events leading up to the event	T Time (Does the condition come and go? Duration?)	
T.I.C.S.	D.C.A.P. / B.T.L.S.	
T Tracks, tags, tattoos	D Deformities	B Burns
I Instability	C Contusions	T Tenderness
C Crepitus	A Abrasions	L Lacerations
S Scars	P Punctures	S Swelling

START TRIAGE

(Simple Triage and Rapid Treatment)

