

**PROTOCOL
Routine Trauma Care**

Overview: Assessment and management of patients with injury or suspected injury shall be conducted in accordance with State of Wisconsin Standard Procedures. Time from injury to definitive trauma center care is a critical factor in the morbidity and mortality of the injured patient. On-scene times should be kept to a minimum and the patient should be promptly transported to the trauma center.

Definition of major Trauma: (as defined by the Northeast Wisconsin Regional Trauma Advisory Council)

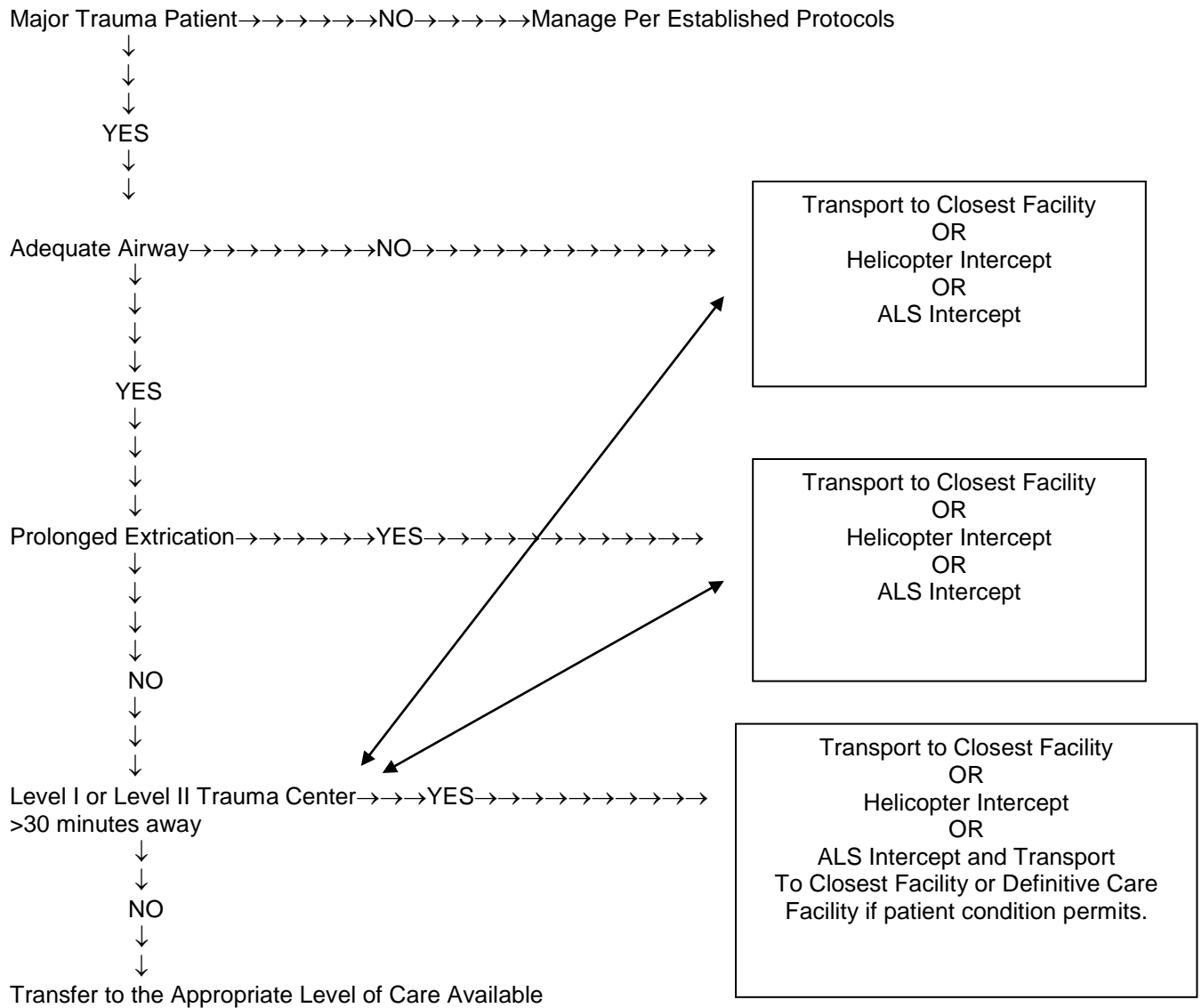
1. Unresponsive to voice commands
2. Systolic Blood Pressure less than 90
3. Systolic Blood pressure less than 70 in child under 5, or under 80 in child over 5
4. Respiratory rate less than 10 or greater than 30 breaths per minute
5. Ineffective breathing, grunting or stridor in a child
6. Penetrating injury to head, neck, torso or proximal extremity
7. Flail chest
8. Trauma with concurrent burns greater than 15% Body Surface Area
9. Distended, rigid abdomen with signs of shock
10. Two or more long bone fractures
11. Depressed or open skull fracture
12. Unstable pelvic fracture
13. New onset paralysis
14. Amputation proximal to wrist or ankle

Indicators of possible Major Trauma:

1. Ejection from automobile during crash
2. Death of another occupant of same vehicle in a crash
3. Extrication time in excess of 20 minutes
4. Falls from higher than 20 feet. Use 10 feet for a child
5. Victim of a roll over motor vehicle crash
6. Victim of a high speed vehicle crash; >40mph, >20mph for a child
7. Major auto deformity, intrusion of damage into passenger compartment
8. Auto vs. pedestrian or bicycle
9. Pedestrian thrown or run over
10. Any motorcycle crash
11. Trauma patient with extremes of age <5 or >55
12. Injured patient with underlying lung or cardiac disease
13. Injured patient who is pregnant
14. Injured patient who is immunosuppressed
15. Injured patient with bleeding disorder or who is on anticoagulation medication

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Transport, Air Medical and ALS Intercept Guidelines:



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Emergency Medical Responder, BLS, ILS and ALS Care: should be focused on assessing the situation and initiating care to assure the patient is maintaining an airway, is breathing, has a perfusing pulse and beginning treatment for shock. Assure scene safety. Use appropriate personnel and equipment for rescue.

1. Scene Survey:
 - a. Assess for hazards.
 - b. Determine number of patients.
 - c. Note mechanism of injury.
 - d. Special extrication needs.
2. Initial Assessment:
 - a. General impression of the patient's condition and patient situation.
 - b. Assess level of consciousness (AVPU).
 - c. Maintain C-spine in neutral position manually.
 - d. Assess, secure and maintain a patent airway using C-spine precautions.
 - e. Place airway adjunct if indicated.
 - f. Assess breathing and respiratory effort:
 - i. Approximate rate.
 - ii. Quality (depth of ventilation and movement of air).
 - iii. OXYGEN: preferably 15 L/min by mask. If the patient does not tolerate a mask, then administer 6 L/min by nasal canal. Be prepared to support the patient's respirations with ventilation via bag-valve-mask.
 - g. Assess circulation by evaluating:
 - i. Carotid and radial pulses.
 - ii. Skin temperature, color and condition.
 - iii. Immediately control major (arterial or heavy venous) external bleeding.
3. Critical Decision / Establish Patient Priorities (based on MOI and initial exam)
 - a. Rapid Trauma Assessment (if the patient has significant MOI or injuries)
 - b. Focused Trauma Assessment (if the patient has isolated injury and there is no significant MOI)
4. Rapid Trauma Assessment Vs. Focused Trauma Assessment
 - a. Rapid Trauma Assessment (if the patient has significant injuries or MOI).
 - b. Inspect Head and Neck:
 - i. DCAP-BLS, TIC, Obvious wounds.
 - ii. JVD.
 - iii. Tracheal Deviation.
 - iv. Tenderness.
 - c. Inspect Chest:
 - i. DCAPP-BLS and TIC.

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- ii. Breath Sounds - Present / Equal? Heart sounds.
 - iii. Obvious wounds, open sucking chest wound, flail chest?
 - d. Brief examination of abdomen:
 - i. DCAP-BLS, Obvious wounds.
 - ii. Soft, rigid, distended, tender?
 - e. Inspect pelvis and extremities:
 - i. DCAP-BLS and TIC.
 - ii. Extremity PMS (CMS).
 - f. Posterior Exam:
 - i. Log roll patient with minimum of 2 rescuers (protecting the spinal).
 - ii. DCAP-BLS.
 - iii. Place backboard along patient and log roll onto board and immobilize.
 - g. Critical Decision / Load and Go?
 - i. If the patient meets Load and Go criteria:
 - 1. Manage the airway.
 - 2. Immobilize C-spine.
 - 3. Transport immediately.
 - 4. Detailed Exam is performed enroute.
 - 5. Other interventions are performed enroute (i.e., IV access, splinting, bandaging)
- 5. Detailed Exam:
 - a. SAMPLE History (if not obtained during rapid trauma assessment)
 - b. Vital signs (Reassess vitals every 5 minutes if significant injuries or MOI).
 - c. Neurological Exam
 - i. Level of Consciousness (AVPU)
 - ii. Glasgow Coma Scale
 - iii. Pupils
 - iv. PMS (CMS)
 - d. Head – to – Toe Exam (DCAP, BTLS, TIC, PMS)
- 6. Interventions, shock resuscitation and wound care if indicated.
- 7. Evaluate effectiveness of interventions (re-assess).
- 8. On-going Exam
 - a. Monitor mental status
- 9. Evaluate effectiveness of interventions (re-assess).

Critical Thinking Elements:

- It is strongly recommended that IVs be established enroute to the hospital thereby not delaying transport time of critical trauma patients.
- If intubation is required, intubate using in-line stabilization of cervical spine. Do not delay transport.
- Prompt transport with early notification of Medical Control and the receiving hospital will expedite the care of the trauma patient.
- Trauma patients should be transported to the closest, most appropriate Trauma Center. Medical Control should be contacted immediately if there is any question as to which Trauma Center the patient should be transported to.

Acronyms

D—Deformities	B—Burns	P—Pulse (Distal Pulse)	T—Tenderness
C—Contusions	L—Lacerations	M—Motor	I—Instability
A—Abrasions	S—Swelling	S—Sensory	C—Crepitus
P—Punctures/Penetrations			
P—Paradoxical Motion			

AVPU	=	Alert, responds to Verbal stimuli, responds to Painful stimuli, Unresponsive
JVD	=	Jugular vein distention
MOI	=	Mechanism of Injury

PROTOCOL

Shock Due To Trauma / Hemorrhage

Overview: Common signs and symptoms of shock include: confusion, restlessness, combativeness, unconscious (altered Level of Consciousness); pale, cool, clammy skin (diaphoresis); rapid, thready pulse (tachycardia); respiratory rate greater than 24 per minute (tachypnea); systolic blood pressure less than 100 systolic (hypotension). Conditions that may indicate impending shock include significant mechanism of injury, tender and/or distended abdomen, pelvic instability and bilateral femur fractures. Load and Go with any trauma patient with signs and symptoms of shock. On scene treatment should consist of conducting the Initial and Rapid Trauma Assessments, managing the airway and ventilation, C-spine control and immobilization, control of severe (life threatening) bleeding and Load and Go.

Emergency Medical Responder Care should be focused on assessing the situation and initiating care to assure the patient is maintaining an airway, is breathing, has a perfusing pulse and beginning treatment for shock.

1. Render initial care in accordance with the Routine Patient Care Protocol and Routine Trauma Care Protocol.
2. **OXYGEN:** preferably 15 L/min by mask. If the patient does not tolerate a mask, then administer 6 L/min by nasal canal. Be prepared to support the patient's respirations with ventilation via bag-valve-mask.
3. Control bleeding using direct pressure, pressure dressings and pressure points.

BLS/ILS and ALS Care should be directed at conducting a thorough patient assessment, providing care to assure the patient is maintaining an airway, is breathing, has a perfusing pulse, beginning treatment for shock and preparing or providing patient transportation.

1. Render initial care in accordance with the Routine Patient Care Protocol, Routine Trauma Care Protocol and BLS care as above. (ILS/ALS may initiate IV line)
2. **OXYGEN:** preferably 15 L/min by mask. If the patient does not tolerate a mask, then administer 6 L/min by nasal canal. Be prepared to support the patient's respirations with ventilation via bag-valve-mask.
3. IV FLUID THERAPY: (If the patient has an altered level of consciousness or hypotension.)
 - a. Administer a **NORMAL SALINE 200-500 ml fluid bolus**. Reassess after completion. If still hypotensive give additional 500 ml bolus. May infuse up to a total of 2 L.
4. Assure prompt transport with early notification of Medical Control and the receiving hospital.

Critical Thinking Elements:

- Hypotension may not occur in the early stages of decrease tissue perfusion, however, aggressive therapy is indicated if shock is suspected or mechanism of injury is significant.
- In the unstable trauma patient, manage the airway, control the C-spine, then load and go. Prolonged care in the field is contraindicated.
- Assessment and management of the trauma patient should be conducted in accordance with BTLS guidelines.
- IV access should be established enroute to the hospital thereby not delaying transport time of critical trauma patients.
- IV fluid bolus and flow rate should be regulated and patient response to fluid resuscitation closely monitored. Multiple, unregulated, wide-open IV lines are not advocated for hypotensive patients suffering from hemorrhagic shock. Contact Medical Control for guidance.
- If intubation is required, intubate using in-line stabilization of cervical spine. Do not delay transport.

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- Prompt transport with early notification of Medical Control and the receiving hospital will expedite the care of the trauma patient.
- Trauma patients should be transported to the closest, most appropriate facility. Medical Control should be contacted immediately if there is any question as to which facility the patient should be transported.

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Head Trauma

Overview: Injuries to the head may cause underlying brain tissue damage. Increased intracranial pressure from bleeding or swelling tissue is a common threat after head trauma. Common signs and symptoms of increased intracranial pressure includes decreased level of consciousness dilated or unequal pupils, increased systolic blood pressure, decreased pulse and narrowing pulse pressure. Priorities for the treatment of head-injury patients include maintenance of adequate oxygenation and blood pressure as well as appropriate attention to possible cervical spine injury and control.

Emergency Medical Responder Care should be focused on assessing the situation and initiating care to assure the patient is maintaining an airway, is breathing, has a perfusing pulse and beginning treatment for shock.

1. Render initial care in accordance with the Routine Patient Care Protocol and Routine Trauma Care Protocol.
2. **OXYGEN:** preferably 15 L/min by mask. If the patient does not tolerate a mask, then administer 6 L/min by nasal canal. Be prepared to support the patient's respirations with ventilation via bag-valve-mask.
3. Control external bleeding using direct pressure and pressure dressings.
4. Be prepared for vomiting and have suction ready.
5. Elevate head of board 30 degrees if systolic blood pressure is greater than 100mmHg.

BLS should be directed at conducting a thorough patient assessment, providing care to assure the patient is maintaining an airway, is breathing, has a perfusing pulse, beginning treatment for shock and preparing or providing patient transportation.

1. Render initial care in accordance with the Routine Patient Care Protocol, Routine Trauma Care Protocol and BLS care as above. (ILS/ALS may initiate IV line and test blood glucose)
2. **OXYGEN:** preferably 15 L/min by mask. If the patient does not tolerate a mask, then administer 6 L/min by nasal canal. Be prepared to support the patient's respirations with ventilation via bag-valve-mask. RSI may be indicated to protect the airway (See RSI protocol).

ILS and ALS Care

3. IV FLUID THERAPY: (If the patient has an altered level of consciousness or hypotension.)
 - a. Administer a 200-300 ml fluid bolus
4. If signs of increased intracranial pressure are NOT present and the patient has an altered mental status:
 - a. **DEXTROSE 50%, 50 ml IVP** if blood glucose level is less than 60mg/dl
 - b. If no response to DEXTROSE, administer **NARCAN 2 mg IVP**. May be given IM if unable to establish IV.
5. Repeat vital signs and trauma score every 5 minutes en route.
6. Assure prompt transport with early notification of Medical Control and the receiving hospital.

Critical Thinking Elements

- Patients with adequate ventilatory effort (6-8 breaths per minute in the adult) should receive 100% oxygen by NRM. Patients with poor ventilatory effort (slow rate or shallow breathing) may need assisted ventilations at normal rate. Hyperventilation of the head trauma patient should be avoided.

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- Deeply comatose patients may require intubation to assure adequate airway. Use in-line stabilization of cervical spine when intubating the head trauma patient. Aggressive hyperventilation is to be avoided.
- Restrict IV fluids to keep open rate if the systolic blood pressure is 100mmHg or greater.
- Treat for hemorrhagic shock if the patient's systolic blood pressure is less than 100mmHg. Hypotension worsens brain injury. Fluid administration should not be withheld in hypotensive head injury patients.
- RSI should be used to protect the unconscious or deeply altered patient.

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Spinal Trauma

Overview: Injuries to the spine commonly result from mechanism of injury involving high kinetic energy. Mechanisms of injury suggesting possible spinal injury include falls, MVAs and forceful blows to the head or neck. Any neurovascular impairment and spinal deformity indicates the likelihood of spinal injuries.

Emergency Medical Responder Care should be focused on assessing the situation and initiating care to assure the patient is maintaining an airway, is breathing, has a perfusing pulse and beginning treatment for shock. Use appropriate personnel and equipment for rescue.

1. Render initial care in accordance with the Routine Patient Care Protocol and Routine Trauma Care Protocol.
2. **OXYGEN:** preferably 15 L/min by mask. If the patient does not tolerate a mask, then administer 6 L/min by nasal canal. Be prepared to support the patient's respirations with ventilation via bag-valve-mask.
3. Frequently reassess patient's airway/ventilatory status: rate/depth of respiration, ability to talk.
4. Assess and record any pain on palpation of spine, motor/sensory deficits in any extremity, abnormal (hold-up) arm position, ptosis and/or priapism.
5. Assess skin for temperature (initially warm), color (flushed), and absence of sweating (dry below injury). Cover patient; keep warm. Assess for neurogenic shock: decreased BP, decreased pulse, decreased respiratory rate.
6. Patient may be very anxious; provide psychological support.
7. Extrication/immobilization: apply appropriately sized rigid cervical collar and full spinal immobilization. Sitting patients that are stable and in a stable environment shall use KED.
8. Protect paralyzed limbs by securing patient to backboard.

BLS/ILS and ALS Care should be directed at conducting a thorough patient assessment, providing care to assure the patient is maintaining an airway, is breathing, has a perfusing pulse, begin treating for shock and preparing or providing patient transportation.

1. Render initial care in accordance with the Routine Patient Care Protocol, Routine Trauma Care Protocol and BLS care as above. (ILS/ALS may initiate IV line)
2. **OXYGEN:** preferably 15 L/min by mask. If the patient does not tolerate a mask, then administer 6 L/min by nasal canal. Be prepared to support the patient's respirations with ventilation via bag-valve-mask. Be prepared to intubate if motor/sensory deficit progresses in arms and/or respiratory depth diminishes.
3. IV FLUID THERAPY: (If the patient has an altered level of consciousness or hypotension.)
 - a. Administer a **NORMAL SALINE 200-500 ml fluid bolus**
4. **DOPAMINE:** If the patient remains hypotensive (systolic less than 100), consult MEDICAL CONTROL for orders to administer a Dopamine infusion. Dopamine is provided premixed (400 mg) in 250cc D5W solution. This yields a concentration of 1600mcg/ml. The initial rate of infusion is 1—10mcg/kg/minute, which can be obtained with a 24gtts/minute-infusion rate. Begin infusion at 24gtts/min and increase by 12gtts/min every 2 minutes to achieve and maintain a mean arterial pressure (MAP) greater than 80 mmHg. Closely monitor vital signs.
5. Repeat vital signs and trauma score every 5 minutes en route.
6. Assure prompt transport with early notification of Medical Control and the receiving hospital.
7. Document CMS before, and after, and size of C-Collar.

Critical Thinking Elements

- Spinal immobilization should be accomplished if there is any doubt or suspicion the patient has sustained a spinal injury. A poor neurological outcome due to lack of immobilization far outweighs the discomfort of immobilization to those without injuries.
- In all situations, airway and ventilation have the highest priority and must be addressed with minimal movement of the patient prior to full assessment and immobilization.
- Treat for shock if the patient's systolic blood pressure is less than 100mmHg. Hypotension worsens spinal injury.

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Extremity Injuries

Overview: Attention should be given to extremity injuries to limit further pain and damage to the patient. However, extremity care should not interfere with life saving measures or decisions. Signs of extremity include injury pain, deformity, contusion, tenderness, swelling, instability, crepitus and lack of distal pulses. In the unstable trauma patient, manage the airway and C-spine, immobilize on a longboard then load and go. Prolonged care in the field is contraindicated. Transport of the unstable or “load and go” trauma patient should not be delayed for managing extremity injuries. These injuries should be managed enroute.

Emergency Medical Responder, BLS, ILS and ALS Care: should be focused on assessing the situation and initiating care to assure the patient is maintaining an airway, is breathing, has a perfusing pulse and beginning treatment for shock.

1. Render initial care in accordance with the Routine Patient Care Protocol and Routine Trauma Care Protocol (ILS/ALS may initiate IV line). IV access should not be attempted in the injured extremity.
2. **OXYGEN:** preferably 15 L/min by mask. If the patient does not tolerate a mask, then administer 6 L/min by nasal canal.
3. Control external bleeding:
 - a. Apply direct pressure and pressure dressing.
 - b. Elevate the extremity, if possible.
 - c. Apply pressure to pressure point.
 - d. Apply tourniquet if other methods are unable to control severe hemorrhage or would inappropriately delay transport.
 - e. Do not use clamps.
 - f. Check and record distal pulse, motor and sensory functions.
4. Dress and splint injured extremity (muscular-skeletal-joint injuries).
 - a. Using a rigid splint for long bones, immobilize the joints above and below the injury site.
 - b. Using a rigid splint for joint injuries, immobilize the long bones above and below the injured site.
 - c. If a soft splint or pillow is used, assure the joints and bones are immobilized sufficiently to stabilize the injured structures.
 - d. If no distal pulse is present and the extremity is angulated, reduce by applying manual traction until pulses return.
 - e. Recheck and record distal pulse, motor and sensory functions.
5. Amputation
 - a. Control external bleeding.
 - b. Dress, bandage and/or splint injured extremity.
 - c. If partially amputated, NEVER COMPLETE THE AMPUTATION.
 - d. Try to RECOVER THE SEVERED PART, collecting all possible tissue and bone fragments, etc.
 - e. Care of Severed Part:

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- i. Wrap in sterile gauze, towel or sheet.
 - ii. Wet dressing with sterile water or lactated ringers.
 - iii. Place part in waterproof bag or container and seal. DO NOT immerse amputated part in any solutions.
 - iv. Place this container in another container filled with ice or cold water. DO NOT allow the tissue to freeze.
 - v. Transport with the patient.
6. ALS shall manage pain according to the pain protocol.
7. Transport as soon as possible.

**PROTOCOL
Traumatic Arrest**

Overview: Resuscitation success rates of trauma patients in cardiac arrest are extremely poor. This is usually due to prolonged hypoxia. Resuscitation efforts are more likely to be successful if EMS arrives early in the arrest, understands the differences in the trauma arrest and the medical arrest and treatment is directed at identifying and treating the underlying cause. Traumatic arrest is usually caused by airway problems (unmanaged airway during unconsciousness), breathing problems (chest trauma) and/or circulatory problems (hemorrhagic shock). Patients who are found in Asystole after massive blunt trauma or penetrating trauma of a vital organ are probably dead; they may be pronounced dead on-scene with the concurrence of Medical Control.

Emergency Medical Responder / BLS, ILS and ALS Care should be focused on rapid scene and initial survey to confirm the patient is in cardiopulmonary arrest and determine if resuscitation will be attempted. Medical Control must be contacted and consulted for death determination and cease effort orders if resuscitation will not be attempted. Resuscitative efforts should be initiated immediately if resuscitation will be attempted. It is important to assure CPR, if it is being performed, is being performed correctly.

1. Rapid scene survey and initial exam to find possible cause(s) of arrest and determine if resuscitation will be attempted.
2. Initiate cardiopulmonary arrest protocols and procedures.
3. If MVA and still in vehicle; rapid extrication. Load and go.
4. If penetrating trauma; load and go.
5. Special considerations in trauma arrests:
 - A. Rapidly immobilize the spine.
 - B. Treat dysrhythmias.
 - C. (ALS) Intubate using in-line stabilization of the cervical spine. Combitube may be used (FRLS—if appropriately trained; BLS, ILS, ALS).
 - D. (ILS & ALS) Enroute to hospital, start 2 large bore (14/16 gauge) IVs at a rate to achieve and maintain peripheral perfusion (systolic BP 90 - 100 mm Hg). Do not delay transport attempting to start IV/IOs. IV/IO attempts should be made enroute.
 - E. (ALS) If chest trauma is present; EVALUATE need for needle chest decompression.
 - F. (ALS—Paramedic only) If chest trauma is present; Evaluate need for Pericardiocentesis.
6. **Expedient transport and early notification of Medical Control and receiving hospital is imperative.**

PROCEDURE
Critical Trauma (Load and Go) Situations

Description: There are certain situations that require hospital / trauma center treatment within minutes if the victim is to have any chance for survival. The initial trauma assessment is designed to identify these situations. When these situations are recognized, the victim should be loaded immediately onto a backboard, transferred to the ambulance and transported promptly. Airway management, ventilation support and spinal immobilization are the only procedures that should be managed prior to transport. Other lifesaving procedures should be done during transport. Non-lifesaving procedures (such as splinting and bandaging) must not hold up transport.

Indications: Load and Go Criteria - Critical Trauma Situations:

1. Head injury with unconsciousness, unequal pupils or decreasing level of consciousness.
2. Airway obstruction that cannot be quickly relieved by mechanical methods such as suction, forceps or intubation.
3. Conditions resulting in possible inadequate breathing:
4. Large open chest wound (sucking chest wound).
5. Large flail chest.
6. Tension pneumothorax.
7. Major blunt chest injury.
8. Laryngotracheal fracture.
9. Traumatic cardiopulmonary arrest.
10. Shock.
11. Signs of conditions that may rapidly lead to shock:
12. Tender, distended abdomen.
13. Pelvic instability.
14. Bilateral femur fractures.

Procedure: Trauma care for the load and go patient:

1. Perform initial and rapid trauma assessments.
2. Once a load and go situation is recognized:
 - Complete rapid trauma assessment.
 - Assure airway is controlled and ventilate the patient if respiratory effort is inadequate.
 - Maintain spinal immobilization.
3. LOAD AND GO.
4. Complete Detailed Exam in ambulance enroute to hospital.
5. ILS/ALS Care. IV Fluid Therapy: Two (2) large bore IVs of NS at a rate to achieve and maintain peripheral perfusion (systolic BP of 90 - 100 mm Hg) may be attempted enroute to hospital / trauma center.
6. CONTACT MEDICAL CONTROL as soon as possible. Call in as a "Trauma Team Alert".

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Special Considerations:

- IV access should be established enroute to the hospital thereby not delaying transport time of critical trauma patients.
- IV fluid bolus and flow rate should be regulated and patient response to fluid resuscitation closely monitored. Multiple, unregulated, wide-open IV lines are not advocated for hypotensive patients suffering from hemorrhagic shock. Contact Medical Control for guidance.
- If intubation is required, intubate using in-line stabilization of cervical spine. Do not delay transport.
- Prompt transport with early notification of Medical Control and the receiving hospital will expedite the care of the trauma patient.
- Trauma patients should be transported to the closest, most appropriate Trauma Center. Medical Control should be contacted immediately if there is any question as to which Trauma Center the patient should be transported.

**PROCEDURE
Trauma Score/Glasgow Coma Scale**

Description: A standard procedure for assessing trauma scores in the field is necessary so that both field personnel and emergency department personnel recognize the reliability of that trauma score.

Indications: Required documentation for all patients.

Procedure:

Respiratory Rate

The respiratory rate is measured by counting the rhythmic rise and fall of the chest for 15 seconds. Multiply the number of respirations by four (4) to obtain the Respiratory Rate per-minute. If the patient's respirations are such that they are difficult to detect, place your hand on the patient's sternum and count the respirations for 15 seconds. Once again, multiply by four (4) to obtain the respiratory rate per-minute.

Respiratory rate and assigned score:

10 to 29	=	4 points
Greater than 29	=	3 points
6 to 9	=	2 points
1 to 5	=	1 point
0	=	0 points

Initiate ventilation support for a score of 3 or below.

Systolic Blood Pressure

The systolic blood pressure is the first pulse sound heard as the blood pressure cuff is slowly deflated. If the blood pressure is not audible, a palpable pressure should be obtained (attempted). A palpable systolic blood pressure is the first pulse beat felt at the distal artery as the blood pressure cuff is slowly deflated.

Systolic blood pressure and assigned score:

Greater than 89	=	4 points
76 – 89	=	3 points
50 – 75	=	2 points
1 – 49	=	1 point
0	=	0 points

A score of 3 or below indicates an unstable patient and the need to load and go.

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Glasgow Coma Scale (Eye opening, Verbal response, Motor response)

The Glasgow Coma Scale has been designed to quantitatively relate consciousness to motor responses, verbal responses, and eye opening. The examiner determines the patient's best response to a set of standardized stimulus.

Eye Opening

The examiner determines the minimum stimulus that evokes opening of one or both eyes.

Spontaneous	(4 points)	Eyes are open when assessment begins.
Voice	(3 points)	Eyes open to speech. The patient may need to be commanded to open his eyes by the examiner. This should be shouted if necessary to get a response.
Pain	(2 points)	If verbal stimulation is unsuccessful, noxious stimuli is applied to the upper extremities observing the eyes for opening response.
None	(1 point)	If there is no eye opening response to the above stimuli.

NOTE: If the patient can not realistically open the eyes because of bandages, edema or direct trauma, please note and document in the patient's medical record.

Best Verbal Response

The examiner determines the patient's best response to a set of standardized questions:

Who are you?
Where are you?
What month is it?
What year is it?

Oriented	(5 points)	The patient is able to answer the above questions appropriately.
Confused	(4 points)	The patient is unable to give correct responses to questions, but he/she is capable of producing phrases or sentences.
Inappropriate Words	(3 points)	The patient speaks only a few words at a time (these words may be obscenities). Typically the response is obtained through noxious stimulus rather than verbal stimulus.
Incomprehensive Sounds	(2 points)	The patient's response consists of moans, groans or mumbling. There are no recognizable words.
No Verbal Response	(1 point)	No vocalizations even to noxious stimuli, which is repeated and prolonged (30 seconds).

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NOTE: If the patient is intubated, dysphasic or has maxillofacial injuries which may preclude a verbal response, the examiner's assessment should be documented in the patient's medical record.

Best Motor Response

Examiner determines the BEST movement from either arm in response to stimulus.

Obeys Simple Commands	(6 points)	Comprehends and responds to instructions. This instruction is usually given verbally, (i.e., the patient raises his arm on request).
Localizes Pain	(5 points)	Patient fails to obey commands, but after noxious stimulus, the patient reaches to the stimulus to remove the source of stimulus.
Flexion Withdrawal	(4 points)	After noxious stimulation there is flexion of the elbow but the patient does not localize the stimulus or attempt to remove the stimulus.
Abnormal Flexion	(3 points)	The patient abducts his shoulder flexes and pronates his arm, flexes wrist and makes a fist in response to stimuli (decorticate rigidity).
Abnormal Extension	(2 points)	The patient abducts and internally rotates his shoulder, extends the forearm, flexes the wrist, and makes a fist in response to stimulus.
No Motor Response	(1 point)	The stimulus should be applied for at least 30 seconds to assure any possible response.

NOTE: If the patient has suspected or known Spinal Cord Injury, this neurological deficit should be noted in the patient's medical records.

Computing the Revised Trauma Score

The Revised Trauma Score (RTS) is computed by adjusting the Glasgow coma score to a scale with measurement for the respiratory rate and systolic blood pressure. All three scores are then added to obtain the RTS. The conversion scale for the GCS is indicated below along with the scales for respiratory rate and systolic blood pressure.

Glasgow Coma Scale	13 – 15	4 points
	9 – 12	3 points
	6 – 8	2 points
	4 – 5	1 point
	0 – 3	0 points
Respiratory Rate	10 - 29	4 points
	Greater than 29	3 points
	6 – 9	2 points
	1 – 5	1 point
	0	0 points
Systolic Blood Pressure	Greater than 89	4 points
	76 – 89	3 points
	50 – 75	2 points
	1 – 49	1 point

PROCEDURE
Spinal Immobilization

DESCRIPTION: Any type of patient manipulation may be dangerous during care of the suspected spinal injury patient. The following procedure should be used to maintain spinal stabilization during patient treatment and movement.

INDICATIONS: Mechanisms of injury suggesting possible spinal injury or complaints of neck or back pain.

MATERIALS/EQUIPMENT: Minimum of two trained rescuers; long and short spine boards; securing straps, belts and tape; towel rolls and head immobilizers; rigid cervical collars

APPROVED FOR: BLS, ILS, and ALS. Emergency Medical Responders may perform procedure if have approved training

PROCEDURE:

1. Suspect possible spinal injury in ALL patients with:
 - a. Head or facial trauma (i.e., injuries above the clavicle).
 - b. Patients with decreased or altered level of consciousness when events leading to the episode are unknown.
 - c. Suspected deceleration injuries, auto wrecks, falls, ejections, etc.
 - d. Complaints of neck or back pain not related to medical history.
 - e. Physical findings suggesting neck or back injury.
 - f. Mechanism of injury unknown or questionable.
2. Spinal Management
 - a. Routine Trauma Care.
 - b. Upon patient contact, immediately establish manual immobilization of the cervical spine.
 - c. Use "Spinal Immobilization Algorithm" (page 22) to determine need for immobilization.
 - d. Approach the patient in a manner that prevents the patient from moving his/her head and neck to answer your questions or to view you.
 - e. Stabilize the patient's head and neck in a neutral in-line position by grasping the patient's head along the lateral aspects and performing the; modified jaw thrust (if indicated).
 - f. Once airway, breathing and circulatory status have been evaluated apply a rigid formed cervical collar.
 - g. Using an acceptable patient movement technique and appropriate number of personnel, position the patient on a full (long) backboard. Assess and document neurovascular status before and after moving the patient.
 - h. Secure the patient's head with an approved cervical-head immobilizer and straps or towel rolls and tape.
 - i. Secure the patients torso and extremities to the backboard by use of straps or belts.
 - j. Reassess airway, breathing and circulation. Perform on-going assessment.
 - k. Assess and document neurovascular status before and after moving the patient.
3. Sitting Spinal Management

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- a. Stable patients in a safe environment who are found in a sitting position and have a suspected spinal injury should be secured to an extrication device (KED or short board) prior to moving.
 - b. Patients who meet PHTLS load and go criteria or whose condition may be complicated by using an extrication device should be moved using the rapid extrication technique. Proper manual stabilization must be maintained throughout the extrication.
 - c. Secure neutral, in-line stabilization of the head and neck as above.
 - d. Keeping the patient's spine in a neutral in-line position, pivot the patient to a position so that a long board may be secured under the patient's buttock and behind his/her back.
 - e. Lower the patient to the long board and secure as above.
 - f. Assess and document the patient's neurovascular status before and after the move.
4. Lateral Recumbent Management.
 - a. Patients who are found in a lateral recumbent position and have a suspected spinal injury and/or complain of neuro deficit, should be moved as a unit while maintaining neutral, in-line stabilization of the head and neck
5. Document any unusual circumstances.

Selective Spinal Immobilization Algorithm

Selective Spinal Immobilization is a only approved for Advanced EMT, Intermediate and Paramedic Levels with additional training following the WI Scope of Practice.

