TRAUMA PROTOCOLS

Routine Trauma Care Protocol

Assessment and management of patients with injury or suspected injury shall be conducted in accordance with PHTLS / BTLS guidelines. Time from injury to definitive trauma center care is a critical factor in the morbidity and mortality of the injured patient. Scene times should be kept to a minimum and the patient should be promptly transported to the trauma center. ***Trauma notification should be made via telemetry as soon as possible***.

First Responder Care, BLS Care, ILS Care, ALS Care

1. **Scene Assessment (Scene Size-Up)**

   - Ensure scene safety – identify any hazards (*e.g.* fire, downed power lines, unstable vehicle, leaking fuel, weapons).
   - Determine the number of patients.
   - Identify the **mechanism of injury** (gunshot wound, vehicle rollover, high speed crash, ejection from the vehicle).
   - Identify special extrication needs, if any.
   - Call for additional resources if needed.

2. **Primary Survey (Initial Assessment)**
   The purpose of the primary assessment is for the prehospital provider to rapidly identify and manage life-threatening conditions:

   - Obtain a general impression of the patient's condition.
   - Assess, secure and maintain a patent airway while simultaneously using C-spine precautions.
   - Assess breathing and respiratory effort:
     - Approximate respiratory rate.
     - Assess quality of respiratory effort (depth of ventilation and movement of air).
     - **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared suction the airway and support the patient's respirations with BVM (or intubate) if necessary.
     - **Needle Chest Decompression (ALS only)**: if patient is in severe respiratory distress or cardiac arrest with s/s of tension pneumothorax.

Routine Trauma Care Protocol

First Responder Care, BLS Care, ILS Care, ALS Care

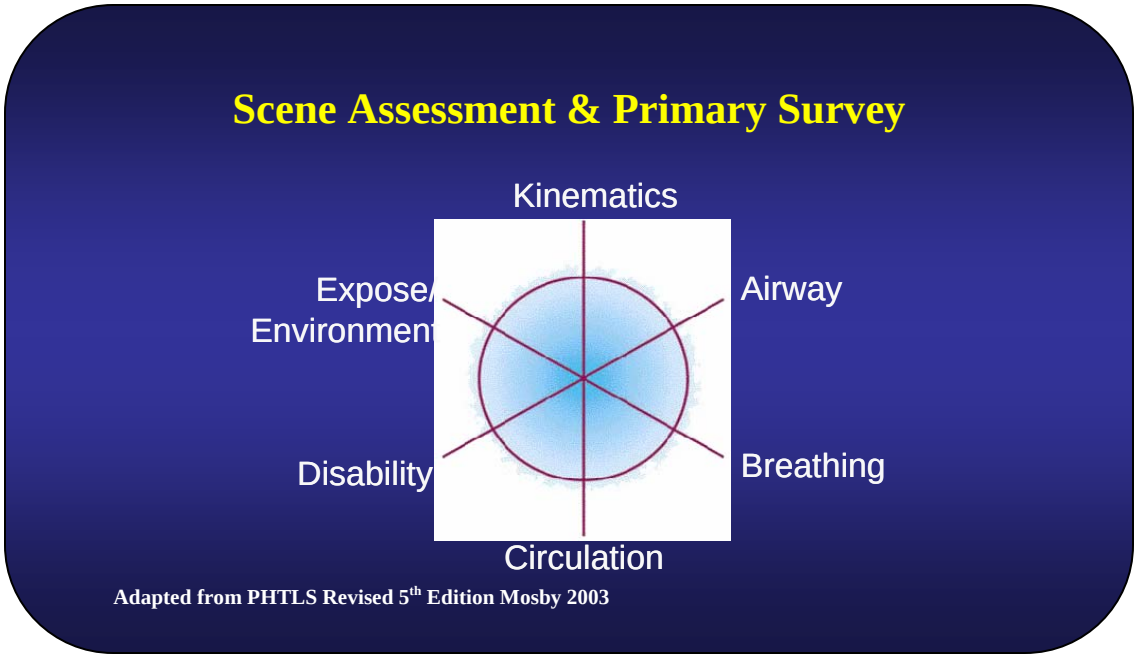
2. Primary Survey (Initial Assessment) (continued)

- Assess circulation:
  - Evaluate carotid and radial pulses.
  - Evaluate skin color, temperature and condition.
  - Immediately control major external bleeding.

- **Critical Decision (**based on mechanism of injury & initial exam**)**:
  - Limit scene time to 10 minutes or less if the patient has a significant mechanism of injury or meets "Load & Go" criteria.

- Determine disability (level of consciousness):
  - **A – Alert**
  - **V – Responds to verbal stimuli**
  - **P – Responds to painful stimuli**
  - **U – Unresponsive**

- Expose the patient:
  - Cut the patient's clothing away quickly to adequately assess for the presence (or absence) of injuries.



Routine Trauma Care Protocol

First Responder Care, BLS Care, ILS Care, ALS Care

3. **Secondary Survey (Focused History & Physical Exam)**
   The secondary survey is a hear-to-toe evaluation of the patient. The object of this survey is to identify injuries or problems that were not identified during the primary survey.

   - Examine the head:
     - Search for any soft tissue injuries.
     - Palpate the bones of the face & skull to identify deformity, depression, crepitus or other injury.
     - Check pupils for size, reactivity to light, equality, accommodation, roundness and shape.

   - Examine the neck:
     - Examine for contusions, abrasions, lacerations or other injury.
     - Check for JVD, tracheal deviation, deformity.
     - Palpate the c-spine for deformity & tenderness.

   - Examine the chest:
     - Closely examine for deformity, contusions, redness, abrasions, lacerations, penetrating trauma or other injury.
     - Look for flail segments, paradoxical movement & crepitus.
     - Auscultate breath sounds.
     - Watch for supraclavicular and intercostals retractions.

   - Examine the abdomen:
     - Examine for contusions, redness, abrasions, lacerations, penetrating trauma or other injury.
     - Palpate the abdomen and examine for tenderness, rigidity and distention.

   - Examine the pelvis:
     - Examine for contusions, redness, abrasions, lacerations, deformity or other injury.
     - Palpate for instability and crepitus.

Routine Trauma Care Protocol

First Responder Care, BLS Care, ILS Care, ALS Care

3. Secondary Survey (Focused History & Physical Exam) (continued)

- Examine the back:
  - Log roll with a minimum of 2 rescuers protecting the spine.
  - Look for contusions, abrasions, lacerations, penetrating trauma, deformity or any other injury.
  - Log roll onto long spine board and immobilize.

- Examine the extremities:
  - Examine for contusions abrasions, lacerations, penetrating trauma, deformity or any other injury.
  - Manage injuries en route to the hospital.

- Neurological exam:
  - Calculate Glasgow Coma Scale (GCS)
  - Reassess pupils
  - Assess grip strength & equality and sensation.
  - Calculate Revised Trauma Score (RTS)

- Vital signs:
  - Blood pressure
  - Pulse
  - Respirations
  - Pulse Oximetry

- History:
  - Obtain a SAMPLE history if possible.
  - Signs & symptoms
  - Allergies
  - Medications
  - Past medical history
  - Last oral intake
  - Events of the incident

Routine Trauma Care Protocol

First Responder Care, BLS Care, ILS Care, ALS Care

3. **Secondary Survey (Focused History & Physical Exam) (continued)**

   - **Interventions (en route)**
     - Cardiac monitor
     - Blood glucose level
     - IV access / fluid bolus
     - Wound care
     - Splinting

4. **Monitoring and Reassessment (Ongoing Assessment)**

   - **Evaluate effectiveness of interventions**
   - **Vital signs every *5 minutes***
   - **Reassess mental status (GCS) every *5 minutes***

5. **CONTACT MEDICAL CONTROL VIA TELEMETRY AS SOON AS POSSIBLE**

Critical Thinking Elements

- **Prompt transport with early Medical Control contact & receiving hospital notification will expedite the care of the trauma patient.**
- **IVs should be established en route to the hospital thereby not delaying transport of critical trauma patients (unless scene time is extended due to prolonged extrication).**
- **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.**

Routine Trauma Care Protocol

Glasgow Coma Scale

Eye Opening	**Spontaneous**	**4**
	To Voice	**3**
	To Pain	**2**
	None	**1**
Verbal Response	**Oriented**	**5**
	Confused	**4**
	Inappropriate Words	**3**
	Incomprehensible Words	**2**
	None	**1**
Motor Response	**Obeys Command**	**6**
	Localizes Pain	**5**
	Withdraw (pain)	**4**
	Flexion (pain)	**3**
	Extension (pain)	**2**
	None	**1**
	TOTAL	

- **Maximum score = 15**
- **Score of 13-15 = Minor injury (generally)**
- **Score of 9-12 = Moderate injury**
- **Score of 8 or less = Major injury and is an indication for intubation (*"GCS less than 8 – intubate")***

Routine Trauma Care Protocol

Revised Trauma Score

		Score
A. Ventilatory Rate	10-29/min	4
	> 29/min	3
	6-9/min	2
	1-5/min	1
	0	0
B. Systolic Blood Pressure	> 89 mmHg	4
	76-89 mmHg	3
	50-75 mmHg	2
	01-49 mmHg	1
	No pulse	0
C. Glasgow Coma Scale Score	13-15	4
	9-12	3
	6-8	2
	4-5	1
	< 4	0

RTS Total = A+B+C _____

Shock (Trauma/Hemorrhage) Protocol

Common signs and symptoms of shock include:

- Confusion
- Restlessness
- Combativeness
- ALOC
- Pallor
- Diaphoresis
- Tachycardia
- Tachypnea
- Hypotension

Conditions that may indicate impending shock include:

- Significant mechanism of injury
- Tender and/or distended abdomen
- Pelvic instability
- Bilateral femur fractures

"Load & Go" with any trauma patient with signs and symptoms of shock – on scene treatment should be minimal. Conduct a *Primary Survey*, manage the airway, take C-spine precautions & immobilize and control any life-threatening hemorrhage. Contact Medical Control as early as possible.

First Responder Care

First Responder Care should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Patient Care Protocol* and *Routine Trauma Care Protocol*.

Shock (Trauma/Hemorrhage) Protocol

First Responder Care (continued)

2. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

3. Control bleeding using direct pressure, pressure dressings and pressure points.

BLS Care

BLS Care should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol* and *Routine Trauma Care Protocol.*

2. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient does not tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

3. Control bleeding using direct pressure, pressure dressings and pressure points.

4. Initiate ALS intercept and transport as soon as possible.

5. Contact Medical Control as soon as possible.

ILS Care

ILS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol* and *Routine Trauma Care Protocol.*

2. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient does not tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

Shock (Trauma/Hemorrhage) Protocol

ILS Care (continued)

3. Control bleeding using direct pressure, pressure dressings and pressure points.

4. **IV Fluid Therapy**: 500mL fluid bolus if needed to obtain a systolic BP of at least 100mmHg.

5. Initiate ALS intercept if needed and transport as soon as possible.

6. **Contact Medical Control** as soon as possible.

ALS Care

ALS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol* and *Routine Trauma Care Protocol*.

2. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient does not tolerate a mask. Be prepared to support the patient's respirations with BVM (or intubate) if necessary.

3. Control bleeding using direct pressure, pressure dressings and pressure points.

4. **IV Fluid Therapy**: 500mL fluid bolus if needed to obtain a systolic BP of at least 100mmHg.

5. Transport as soon as possible.

6. **Contact Medical Control** as soon as possible.

Critical Thinking Elements

- **Hypotension may not occur in the early stages of shock. However, aggressive therapy is indicated if there is a significant mechanism of injury and/or shock is suspected.**
- **IV access should be obtained en route and should not delay transport time.**
- **IV fluid bolus/flow rate should be regulated and patient response to fluid monitored closely.**
- **If intubation is required, intubate using in-line stabilization of the C-spine.**

Head Trauma Protocol

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 include:

- Confusion
- ALOC
- Dilated or unequal pupils
- Markedly increased systolic blood pressure
- Decreased pulse (bradycardia)
- Abnormal respiratory patterns

Priorities for the treatment of head injury patients include airway management, maintenance of adequate oxygenation & blood pressure as well as appropriate C-spine control & immobilization.

First Responder Care

First Responder Care should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Patient Care Protocol*.

2. Be prepared for vomiting and have suction readily available.

3. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

4. Control bleeding using direct pressure, pressure dressings and pressure points.

Head Trauma Protocol

BLS Care

BLS Care should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol* and *Routine Trauma Care Protocol*.

2. Be prepared for vomiting and have suction readily available.

3. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient does not tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

4. Control bleeding using direct pressure, pressure dressings and pressure points.

5. Repeat vital signs, GCS & RTS every ***5 minutes***.

6. If patient has an altered mental status, perform **blood glucose level test**.

7. **Glucagon**: 1mg IM if blood sugar is < 60mg/dL and the patient is unresponsive.

8. Initiate ALS intercept and transport as soon as possible.

9. **Contact Medical Control** as soon as possible.

ILS Care

ILS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol* and *Routine Trauma Care Protocol.*

2. Be prepared for vomiting and have suction readily available.

3. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient does not tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

Head Trauma Protocol

ILS Care (continued)

4. Control bleeding using direct pressure, pressure dressings and pressure points.

5. Repeat vital signs, GCS & RTS every ***5 minutes***.

6. **IV Fluid Therapy**: 500mL fluid bolus if needed to obtain a systolic BP of 100mmHg.

*If signs of increased ICP **are not** present and the patient has an altered mental status:*

7. Perform **blood glucose level test**.

8. **Dextrose 50%**: 25g IV if blood sugar is < 60mg/dL.

9. **Narcan**: 2mg IV or IM

10. Initiate ALS intercept if needed and transport as soon as possible.

11. **Contact Medical Control** as soon as possible.

ALS Care

ALS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol* and *Routine Trauma Care Protocol.*

2. Be prepared for vomiting and have suction readily available.

3. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient does not tolerate a mask. Be prepared to support the patient's respirations with BVM (or intubate) if necessary.

4. Control bleeding using direct pressure, pressure dressings and pressure points.

5. Repeat vital signs, GCS & RTS every ***5 minutes***.

Head Trauma Protocol

ALS Care (continued)

6. **IV Fluid Therapy**: 500mL fluid bolus if needed to obtain a systolic BP of 100mmHg.

*If signs of increased ICP **are not** present and the patient has an altered mental status:*

7. Perform **blood glucose level test**.

8. **Dextrose 50%**: 25g IV if blood sugar is < 60mg/dL.

9. **Narcan**: 2mg IV, IM or SQ.

10. **Contact Medical Control** as soon as possible.

Critical Thinking Elements

- **Head trauma patients should receive oxygen to keep SpO_2 > 95%, preferably via NRM. Patients with poor respiratory effort may require ventilation with a BVM at 10-12 vpm (ventilations per minute).**
- **Avoid hyperventilating a head trauma patient. Oxygen is a powerful vasoconstrictor and cerebral perfusion may be reduced if the patient is hyperventilated. If s/s of increased ICP are present (*Cushing's phenomenon*), then controlled mild hyperventilation may be needed (with Medical Control order) at 20 vpm until s/s of increased ICP have subsided.**
- ***Cushing's phenomenon* refers to the ominous combination of markedly increased arterial blood pressure and resultant bradycardia.**
- **Deeply comatose patients may require intubation (GCS < 8). Use in-line C-spine stabilization and avoid aggressive hyperventilation.**
- **Treat for hemorrhagic shock if the patient's systolic BP is < 100mmHg. Hypotension decreases cerebral perfusion and worsens brain injury and must be corrected.**

Spinal Trauma Protocol

Injuries to the spine commonly result from mechanism of injury involving high kinetic energy. Any neurovascular impairment or spinal deformities are indicative of possible spinal trauma.

Mechanisms of injury suggesting possible spinal injury include:

- Falls
- Motor vehicle crashes (MVCs)
- Gunshot wounds to the head, neck or back
- Forceful blows to the head and neck

First Responder Care

First Responder Care should be focused on assessing the situation and initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock.

1. Render initial care in accordance with the *Routine Patient Care Protocol*.

2. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

3. Frequently reassess the patient's airway & ventilatory status.

4. Assess and record any pain on palpation of the spine, any motor/sensory deficits of the extremities, abnormal arm position, ptosis and/or priapism.

5. Assess skin for temperature which will initially be warm, flushed and dry (below the point of injury). Cover the patient and keep him/her warm.

6. Assess for neurogenic shock: decreased BP, decreased pulse, & decreased respiratory rate.

7. Fully immobilize the patient and protect paralyzed limbs by securing the patient to the backboard.

Spinal Trauma Protocol

BLS Care

BLS Care should be directed at conducting a thorough patient assessment, initiating routine patient care to assure that the patient has a patent airway, is breathing and has a perfusing pulse as well as beginning treatment for shock and preparing the patient for or providing transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol*.

2. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

3. Frequently reassess the patient's airway & ventilatory status.

4. Assess and record any pain on palpation of the spine, any motor/sensory deficits of the extremities, abnormal arm position, ptosis and/or priapism.

5. Assess skin for temperature which will initially be warm, flushed and dry (below the point of injury). Cover the patient and keep him/her warm.

6. Assess for neurogenic shock: decreased BP, decreased pulse, & decreased respiratory rate.

7. Fully immobilize the patient and protect paralyzed limbs by securing the patient to the backboard.

8. Repeat vital signs, GCS & RTS every ***5 minutes***.

9. Initiate ALS intercept and transport as soon as possible.

10. **Contact Medical Control** as soon as possible.

Spinal Trauma Protocol

ILS Care

ILS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol*.

2. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

3. Frequently reassess the patient's airway & ventilatory status.

4. Assess and record any pain on palpation of the spine, any motor/sensory deficits of the extremities, abnormal arm position, ptosis and/or priapism.

5. Assess skin for temperature which will initially be warm, flushed and dry (below the point of injury). Cover the patient and keep him/her warm.

6. Assess for neurogenic shock: decreased BP, decreased pulse, & decreased respiratory rate.

7. Fully immobilize the patient and protect paralyzed limbs by securing the patient to the backboard.

8. Repeat vital signs, GCS & RTS every ***5 minutes***.

9. **IV Fluid Therapy**: 500mL fluid bolus if needed to obtain a systolic BP of at least 100mmHg.

10. Initiate ALS intercept if needed and transport as soon as possible.

11. **Contact Medical Control** as soon as possible.

Spinal Trauma Protocol

ALS Care

ALS Care should be directed at continuing or establishing care, conducting a thorough patient assessment, stabilizing the patient's perfusion and preparing for or providing patient transport.

1. Render initial care in accordance with the *Routine Patient Care Protocol*.

2. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

3. Frequently reassess the patient's airway & ventilatory status.

4. Assess and record any pain on palpation of the spine, any motor/sensory deficits of the extremities, abnormal arm position, ptosis and/or priapism.

5. Assess skin for temperature which will initially be warm, flushed and dry (below the point of injury). Cover the patient and keep him/her warm.

6. Assess for neurogenic shock: decreased BP, decreased pulse, & decreased respiratory rate.

7. Fully immobilize the patient and protect paralyzed limbs by securing the patient to the backboard.

8. Repeat vital signs, GCS & RTS every ***5 minutes***.

9. **IV Fluid Therapy**: 500mL fluid bolus if needed to obtain a systolic BP of at least 100mmHg.

10. **Dopamine**: If the patient remains hypotensive. Begin infusion at 24gtts/min. Increase by 12gtts/min every ***2 minutes*** to achieve and maintain a systolic BP of at least 100mmHg. Closely monitor vital signs.

    - *Dopamine is provided premixed (400mg in 250mL D_5W). This yields a concentration of 1600mcg/mL. The initial rate of infusion is 1-10mcg/kg/min which can be achieved with a 24gtts/min infusion rate.*

Spinal Trauma Protocol

ALS Care (continued)

11. Transport as soon as possible.

12. Contact Medical Control as soon as possible.

Traumatic Arrest Protocol

Resuscitation success rates of trauma patients in cardiac arrest are extremely poor, usually due to prolonged hypoxia. Efforts to resuscitate are more likely to be successful if EMS arrives early in the arrest, understands the differences between traumatic cardiac arrest patients & medical cardiac arrest patients and treatment is directed at identifying & treating the underlying cause. Traumatic arrest is usually caused by airway problems (unmanaged airway during unconsciousness), breathing problems (from chest trauma) and/or circulatory problems (internal or external hemorrhaging).

Patients who are found in **asystole** after massive blunt trauma or penetrating trauma of a vital organ are dead and may be pronounced dead at scene with the concurrence of Medical Control.

First Responder Care, BLS Care, ILS Care, ALS Care

First Responder, BLS, ILS & **ALS** Care should be focused on rapid assessment confirming that the patient is in cardiac arrest and determine if resuscitation will be attempted. Medical Control must be consulted for death determination on scene. If resuscitative efforts are going to be attempted, begin resuscitation *immediately* and "Load & Go" with the patient.

1. Rapidly assess to determine possible causes of the arrest and determine if resuscitation will be attempted.
2. Initiate cardiac arrest protocols and procedures.
3. Rapidly extricate, fully immobilize and "Load & Go".
4. "Load & Go" with any type of penetrating trauma.
5. **ILS Care a**nd **ALS Care: ** Intubate using in-line stabilization of the cervical spine.
6. **ILS Care a**nd **ALS Care:** Obtain IV access en route to the hospital with a 14g or 16g IV catheter (if possible). A 2nd line may be established if time permits.
7. **ILS Care a**nd **ALS Care: IV Fluid Therapy:** 500mL fluid bolus to achieve and maintain a systolic BP of at least 100mmHg.
8. **ALS Only: Needle chest decompression** if chest trauma is present and/or the patient is in PEA and tension pneumothorax is suspected.

Critical Trauma Procedure ("Load & Go" Situations)

There are certain situations that require hospital / trauma center treatment within minutes if the victim is to have any chance for survival. The primary survey (initial 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, ventilatory support, control of **major** hemorrhaging and spinal immobilization are the only procedures that should be managed prior to transport. Other lifesaving procedures should be done en route. Procedures such as splinting and bandaging must not delay transport.

"Load & Go" Criteria

1. Head injury with a decreasing LOC, unresponsiveness or unequal pupils
2. GCS $\leq$ 10
3. Airway obstruction that cannot be quickly relieved by mechanical methods such as suction, Magill forceps or intubation
4. Large open chest wound (sucking chest wound)
5. Large flail chest
6. Tension pneumothorax
7. Major blunt chest trauma
8. Laryngotracheal fracture
9. Traumatic cardiac arrest
10. Shock
11. Tender, distended abdomen
12. Pelvic instability
13. Bilateral femur fractures
14. Penetrating trauma of the head, neck, torso or groin
15. Ejection from a vehicle
16. Amputation above the wrist or ankle
17. Trauma combined with $\geq$ 20% TBSA Burn
18. Falls > 20 feet
19. Pregnancy $\geq$ 24 weeks

Critical Trauma Procedure ("Load & Go" Situations)

Section 515.APPENDIX C Minimum Trauma Field Triage Criteria

SUSTAINED HYPOTENSION – BP ≤ 90 SYSTOLIC (PEDS ≤ 80 SYSTOLIC) ON TWO CONSECUTIVE MEASUREMENTS FIVE MINUTES APART

YES → MANDATORY NOTIFICATION OF THE TRAUMA SURGEON FROM THE FIELD

↓ NO

Category I
Blunt or Penetrating Trauma with Unstable Vital Signs and/or:

- Hemodynamic compromise as evidenced by:
  - BP ≤ 90 Systolic
  - Peds BP ≤ 80 Systolic
- Respiratory compromise as evidenced by:
  - Respiratory rate <10 or >29
- Altered mentation as evidenced by:
  - Glasgow Coma Scale ≤10

Anatomical Injury

- Penetrating injury of head, neck, torso or groin
- Two or more body regions with potential life or limb threat
- Combination trauma with ≥ 20% TBA Burn
- Amputation above wrist or ankle
- Limb paralysis and/or sensory deficit above the wrist and ankle
- Flail chest

YES → INITIATE *FIELD TRAUMA TREATMENT PROTOCOLS*

RAPID TRANSPORT TO TRAUMA CENTER**

↓ NO

Category II
Mechanism of Injury

- Ejection from motor vehicle
- Death in same passenger compartment
- Falls > 20 feet

YES → INITIATE *FIELD TRAUMA TREATMENT PROTOCOLS*

RAPID TRANSPORT TO TRAUMA CENTER**

↓ NO

INITIATE *FIELD TRAUMA TREATMENT PROTOCOLS* AND TRANSPORT TO THE CLOSEST HOSPITAL.

Critical Trauma Procedure ("Load & Go" Situations)

Section 515.APPENDIX C Minimum Trauma Field Triage Criteria (continued)

****** **Based on minimum Trauma Field Triage Criteria, any Category I trauma patient shall be transported to the highest level Trauma Center unless transport time is >30 minutes to that Trauma Center. Any Category II patient will be transported to the closest Level I or Level II Trauma Center unless the transport time is >30 minutes to the Trauma Center.**

Extremity Injury Protocol

Attention should be given to extremity injuries to limit further damage and discomfort for the patient. However, extremity care should never interfere with lifesaving decisions or interventions and should not delay transport of trauma patients.

Signs of extremity injury include:

- Pain
- Deformity
- Contusion
- Tenderness
- Swelling
- Instability
- Crepitus
- Absence of distal pulses

First Responder Care, BLS Care, ILS Care, ALS Care

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*.

2. **Oxygen**: 15 L/min via non-rebreather mask or 6 L/min via nasal cannula if the patient cannot tolerate a mask. Be prepared to support the patient's respirations with BVM if necessary.

3. Control any external bleeding:
   - **a.** Apply direct pressure and pressure dressing.
   - **b.** Elevate the extremity if possible.
   - **c.** Use pressure points.
   - **d.** Assess distal pulse, motor & sensation.

4. Splint musculoskeletal injuries:
   - **a.** Immobilize the joints with a rigid splint above and below the injury for long bone injuries.
   - **b.** Immobilize the long bones with a rigid splint above and below the injured site for joint injuries.
   - **c.** Assure the joints and bones are immobilized sufficiently to stabilize the injured structures (especially when using a soft splint or pillow).
   - **d.** Assess distal pulse, motor & sensation.

Extremity Injury Protocol

First Responder Care, BLS Care, ILS Care, ALS Care

5. If the extremity is angulated and no distal pulse is present, reduce by gently applying manual traction until the pulse returns.

    a. Reassess distal pulse, motor and sensation.

6. Amputation cases:
    a. Control external bleeding.
    b. Dress, bandage and/or splint the injured extremity.
    c. Attempt to recover the severed part:
        - Wrap in sterile gauze, towel or sheet.
        - Wet dressing with sterile water or .9% Normal Saline.
        - Place severed part in waterproof bag or container and seal.
        - Place the bag/container in another container filled with ice or cold water.
        - DO NOT immerse the amputated part in any solutions.
        - DO NOT allow the tissue to freeze.
        - Transport the container with the patient.

7. Initiate ALS intercept if needed and transport as soon as possible.

8. Contact the receiving hospital as soon as possible or Medical Control if necessary.

ILS Care

1. **IV Fluid Therapy**: 500mL fluid bolus if the patient is hypotensive to obtain a systolic BP of at least 100mmHg.

2. Initiate ALS intercept if needed and transport as soon as possible.

3. Contact the receiving hospital as soon as possible or Medical Control if necessary.

Extremity Injury Protocol

ALS Care

1. **IV Fluid Therapy**: 500mL fluid bolus if the patient is hypotensive to obtain a systolic BP of at least 100mmHg.

2. **Morphine Sulfate:** 2-5mg IV *every **5 minutes*** as needed to reduce the patient's anxiety and severity of pain. If unable to establish IV access, may administer Morphine 2-5mg IM every ***15 minutes***.

3. **Promethazine (Phenergan):** 12.5mg IV diluted with 10mL NS and administer over 60 seconds (if systolic BP > 90mmHg) or 12.5mg IM **for nausea and/or vomiting**. Promethazine 12.5mg IV or IM may be repeated one time in ***15 minutes*** to a total dose of 25mg.

4. *If the patient is allergic to Morphine or if Morphine is not effective**:***
   Fentanyl: 50mcg IV over 2 minutes for pain. Fentanyl 50mcg may be repeated one time in ***5 minutes*** to a total dose of 100mcg. If unable to establish IV access, may administer Fentanyl 50 mcg IM. May be repeated one time in ***15 minutes*** to a total of 100mcg.

5. Contact the receiving hospital as soon as possible or Medical Control if necessary.

Critical Thinking Elements

- **In patients with known renal failure, the Fentanyl dose must be reduced to 25mcg. The dose may be repeated one time to a maximum dose of 50mcg.**

Spinal Immobilization Procedure

Any type of patient manipulation may be dangerous during the care of a suspected spinal injury patient. Spinal injury should be suspected in all patients presenting with:

- Head, neck or facial trauma (*i.e.* injury above the clavicles)
- ALOC with unknown history of events
- Complaints of neck or back pain unrelated to the patient's medical history
- Complaint of head pain related to trauma
- Physical findings suggesting neck or back pain
- Unknown mechanism of injury
- High mechanism of injury despite complaints
- Suspected deceleration injuries

General Spinal Management

1. *Routine Trauma Care*.

2. Immediately establish manual stabilization of the cervical spine.
   - **a.** Approach the patient in a manner that prevents the patient from moving his/her head & neck to see you or answer your questions.
   - **b.** Stabilize the patient's head & neck in a neutral in-line position by grasping the patient's head along the lateral aspects (and perform a modified jaw thrust if indicated).

3. Apply a rigid C-collar after airway, breathing and circulatory status have been assessed.

4. Log-roll the patient onto a long backboard. Assess and document neurovascular status *before and after* immobilization.

5. Secure the patient's torso and extremities to the backboard using spider straps or belts.

6. Reassess (perform ongoing assessment).

Spinal Immobilization Procedure

Spinal Management of Patients in a Sitting Position

1. Patients found in a sitting position that have a suspected spinal injury should be secured to an extrication device (*i.e.* KED) prior to being moved.

2. Patients who meet "Load & Go" criteria should be moved using the rapid extrication technique. Proper manual stabilization must be maintained throughout the extrication.
   - **a.** Secure neutral, in-line stabilization of the head & neck (as per *General Spinal Management*).
   - **b.** Keeping the patient's spine in a neutral position, pivot the patient in order to place a long backboard under the patient's buttocks and behind his/her back.
   - **c.** Lower the patient to the long backboard and secure (as per *General Spinal Management*).

Needle Thoracentesis (Needle Chest Decompression) Procedure

Thoracic decompression involves placement of a needle through the chest wall of a critical patient who has a life-threatening tension pneumothorax and is rapidly deteriorating due to intrathoracic pressure.

Signs and symptoms of tension pneumothorax include:

- Restlessness and agitation
- Severe respiratory distress
- Increased airway resistance with ventilations
- JVD
- Tracheal deviation
- Subcutaneous emphysema
- Unequal breath sounds
- Absent lung sounds on the affected side
- Hyper resonance to percussion on the affected side
- Hypotension
- Cyanosis
- Respiratory arrest
- Traumatic cardiac arrest

Initiate *Routine Trauma Care*. If a tension pneumothorax is identified:

1. Locate the 2nd intercostal space in the midclavicular line on the side of the pneumothorax.
2. Cleanse the site with providone-iodine preps and maintain as much of a sterile field as possible.
3. Attach a 10-20mL syringe to a 2 inch, 14g IV catheter.
4. Puncture the skin perpendicularly, just superior to the 3rd rib (in the 2nd intercostal space). Direct the needle just over the 3rd rib and into the thoracic cavity. A "pop" should be felt as well as a "rush of air" along with the plunger of the syringe moving outward.
5. Advance the catheter while removing the needle and syringe.
6. Secure the catheter in the chest will with a dressing and tape.
7. Monitor the patient **closely** and continue to reassess.

Critical Thinking Elements

- **Nerve bundles and blood vessels are located under the ribs and puncturing them could cause nerve damage and extensive bleeding. Ensure that the puncture is being made over the <u>top</u> of the 3rd rib.**